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MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 115

DECEMBER, 1942

Seed Inspection

By F. A. McLaughlin

This report, the fifteenth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1942, by authority of Chapter 94 as amended by Chapter 288 of the Acts of 1937 and Chapter 363 of the Acts of 1938.

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ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:

	Units
Purity analysis (red clover, timothy, etc.)	1
Purity analysis (bluegrass, orchard grass, etc.)	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture)	4-10
Examination for noxious weeds (sample of 4 oz. or less)	2
Identification of seed or plant	.1
Cleaning tobacco seed (4 oz. or less)	2
Germination test (4 x 100 seeds of any seed not chaffy or requiring purity analysis)	1
Germination test (soil, 2 x 100 seeds)	1
Germination test (chaffy grasses or seeds requiring purity analysis)	2

Fees for work in excess of the ten free units allowed to a citizen or resident firm of Massachusetts are as follows:

Germination test of all crop seeds except grasses	\$.25
Germination test of timothy	.25
Germination test of all other grasses	.50
Purity analysis of cereals	.50
Purity analysis of timothy	.75
Purity analysis of all other grasses	1.00
Purity analysis of all other crop seeds	.75
Purity analysis of mixtures of not more than 2 kinds of agricultural seeds	1.00
Purity analysis of special mixtures, including lawn grasses and pasture mixtures — a charge sufficient to cover the actual cost of working the sample, depending entirely upon the character of the sample. Minimum charge	1.25

In no case will the final report be rendered until all fees are paid.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seed of any one kind to be submitted for a germination test is 400.

SEED INSPECTION

By F. A. McLaughlin¹

MASSACHUSETTS VEGETABLE SEED STANDARDS FOR 1943

Section 261D of the Seed Law requires that a set of standards for germination of vegetable seeds be determined each year by the Director of the Massachusetts Agricultural Experiment Station and approved by the Commissioner of Agriculture. The following set of standards for 1943 has been so determined and approved:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke.....	60	Kohlrabi.....	75
Asparagus.....	*70	Leek.....	60
Beans:		Lettuce.....	80
Limas.....	70	Melons:	
Other varieties than Limas.....	80	Muskmelon.....	75
Beets.....	65	Watermelon.....	70
Broccoli.....	75	Mustard.....	75
Brussels Sprouts.....	70	Okra.....	*50
Cabbage.....	75	Onions.....	70
Carrot.....	55	Parsley.....	60
Cauliflower.....	75	Parsnip.....	60
Celeriac.....	55	Peas.....	80
Celery.....	55	Peppers.....	55
Chard, Swiss.....	65	Pumpkin.....	75
Chicory.....	65	Radish.....	75
Chinese Cabbage.....	75	Rhubarb.....	60
Citron.....	65	Rutabaga.....	75
Collards.....	80	Salsify.....	75
Corn, Sweet.....	75	Sorrel.....	60
**Cress, Garden.....	40	Spinach:	
Cress, Water.....	25	Common.....	60
Cucumber.....	80	New Zealand.....	40
Dandelion.....	45	Squash.....	75
Egg Plant.....	60	Tomato.....	75
Endive.....	70	Tomato, Husk.....	50
Fetticus (Corn Salad).....	70	Turnip.....	80
Kale.....	75		

*Including Hard Seeds.

**Garden Cress (*Lepidium sativum*) is also called Pepper Grass and Curled Cress. Should not be confused with Upland Cress or Spring Cress (*Campe verna*) for which no standard has been adopted.

The above set of standards is identical with the one adopted by the United States Department of Agriculture for administration of the Federal Seed Act.

In the enforcement of the law, no tolerances will be allowed below the minimum standards adopted.

¹ Assisted by Miss Jessie L. Anderson, Technical Assistant; Mrs. Merrill Mack, Laboratory Assistant from April to June, 1942; and Miss May J. Honnay, Clerk.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1941 to November 1, 1942, the Seed Laboratory received and worked 4009 samples of seed, of which 968 were collected by the State Department of Agriculture and 3041 were sent in by seedsmen, farmers, and various state institutions. An additional lot of 233 samples of flower seeds, for field tests only, was also received from the State Commissioner of Agriculture.

Classification of these samples with the total number of laboratory tests involved is shown in the following summary. It will be noted that the total number of tests required for the 4009 samples was 4620; 442 for purity and 4178 for germination.

Number of Samples		NUMBER OF TESTS	
		Purity	Germination
338	Field Crops for Purity and Germination	338	338
1	Field Crops for Purity Only	1	—
223	Field Crops for Germination Only	—	223
51	Lawn and Other Types of Mixtures for Purity; Germinations involving 237 ingredients	51	237
52	Lawn Mixtures for Purity Only	52	—
9	Lawn Mixtures for Germination Only; Germinations involving 45 ingredients	—	45
3129	Vegetables for Germination Only	—	3129
40	Herbs for Germination Only	—	40
43	Flower Seeds for Germination Only	—	43
5	Tree Seeds for Germination Only	—	5
91	Tobacco Seeds for Cleaning and Germination	—	91
27	Tobacco Seeds for Germination Only	—	27
<hr/> 4009		<hr/> 442	<hr/> 4178

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested respectively 145 samples of Vegetable seeds, 233 samples of Flower seeds. Results of the field tests are shown on pages 76-94.

The Seed Laboratory cleaned 91 lots of Tobacco seed for Connecticut Valley farmers. The gross weight of the 91 lots of seed amounted to 109.69 lbs. with a net weight of cleaned seed 89.12 lbs.

Explanation of Tables

In these tables the seeds are listed in alphabetical order by groups, each group containing only those seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1937 and 1938, Chapters 288 and 363, defines the group from Alfalfa to Wheat, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

Various symbols have been used to call attention to violations and irregularities and with certain tables a column is devoted to "Notes." Where symbols occur an explanation is given in footnotes at bottom of the page.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

“Tolerance” is applied to both purity and germination, except for vegetable seed found below the minimum germination standards adopted, in which instance no tolerance is allowed. “Germination Tolerance” has been applied between a given germination and the result of the germination test as follows:

GIVEN GERMINATION (PERCENT)	TOLERANCE (PERCENT)
96 or over	5
90 or over, but less than 96	6
80 or over, but less than 90	7
70 or over, but less than 80	8
60 or over, but less than 70	9
Less than 60	10

In the determination of the tolerance for the percentage of the distinguishable kind, type, or variety (pure seed), weed seeds, other crop seeds, and inert matter, the sample shall be first considered as made up of two parts: (a) The percentage of the component (pure seed, weed seed, crop seed or inert matter as the case may be) being considered, and (b) the difference between that percentage and 100. The number represented by (a) is then multiplied by the number represented by (b) and the product is divided by 100. The resulting number is then multiplied by 0.2 (2/10) and the resulting product added to 0.2 or 0.6 as indicated in the following formulae:

$$\text{Pure seed tolerance} = 0.6 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

$$\begin{array}{l} \text{Weed seeds, other crop seeds, and} \\ \text{inert matter tolerance} = 0.2 + \left\{ 0.2 \times \frac{a \times b}{100} \right\} \end{array}$$

For *Poa* spp., *Agrostis* spp., *Festuca* spp., bromegrass, crested wheatgrass, orchard grass, velvet grass, tall oatgrass, meadow foxtail, sweet vernalgrass, Rhodes grass, Dallis grass, carpet grass, and Bermuda grass, and mixtures containing these seeds singly or combined in excess of 50 percent, an additional tolerance shall be allowed. This is to be obtained by adding to the regular tolerance mentioned above the product obtained by multiplying the regular tolerance by the lesser of “a” and “b” divided by 100.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Notes	Noxious Weed Seeds per Ounce
ALFALFA									
1012	ARTHUR R. CONE, Buffalo, N. Y. Grimm, No. 28-306..... Sunshine Feed Store, Westfield	L. 99.50 F. 99.37	0.03 0.12	0.37 0.27	0.10 0.04	75-15 60-29†	1/1942 8/1942		
1049	CRAYER-DICKINSON SEED CO., Buffalo, N. Y. Grimm, No. 27-20..... Methuen Grain Co., Methuen	L. 99.50 F. 99.72	0.10 0.02	0.10 0.26	0.30 —	82-9 84-5	1/1942 8/1942		
966	STANFORD SEED CO., Buffalo, N. Y. Grimm, No. 3234..... The Pittsfield Grain Co., Pittsfield	L. 99.88 F. 99.78	0.08 0.11	0.04 0.04	— 0.04	74-22 84-11	2/1942 8/1942		
1016	WHITNEY SEED CO., Buffalo, N. Y. Grimm, No. 213..... Checkerboard Feed Store, Westfield	L. 99.28 F. 98.79	0.40 0.63	0.26 0.47	0.06 0.11	80-11 79-7	2/1942 8/1942	(C)	
1088	S. D. WOODRUFF & SONS, Orange, Conn. Alfalfa, No. Mc 4714..... Herman F. Davis, Merrimac	L. 99.23 F. 98.37	0.16 0.28	0.57 0.28	0.09 0.47	78-16 83-7	12/1941 8/1942	(m)	
BARLEY									
967	BARBER & BENNETT, INC., Albany, N. Y. Alpha, No. 735..... The Pittsfield Grain Co., Pittsfield	L. 99.30 F. 99.37	0.10 —	0.40 0.58	0.20 0.05	95.00 96.00	1/1942 8/1942		
85	JOSEPH BRECK & SONS, Boston, Mass. Wisconsin 38, No. C 286.....	L. 98.90 F. 99.21	0.02 —	0.45 0.28	0.63 0.51	93.00 94.00	1/1942 8/1942		
BENT GRASS									
82	JOSEPH BRECK & SONS, Boston, Mass. Colonial (Certified Blue Tag Astoria)..... 8433, No. G 93-214	L. 98.93 F. 98.56	— 0.12	1.09 1.25	0.02 0.07	95.00 98.00	1/1942 4/1942	(m)	
1126	ENGBRETSON SEED CO., Astoria, Oregon Blue-tag Seaside, No. 2929..... New England Toro Co., West Newton	L. 99.26 F. 99.22	0.01 —	0.73 0.78	— —	* 84.00	*/ 6/1942		

BLUEGRASS

896	ASSOCIATED SEED GROWERS, INC., New Haven, Conn. Kentucky, No. 48334 Frank Howard, Inc., Pittsfield	L. F.	93.00 93.09	0.10 0.30	0.60 6.51	0.30 0.10	80.00 89.00	2/1942 6/1942	
1127	ALBERT DICKINSON CO., Chicago, Ill. Kentucky, No. 63225 New England Toro Co., West Newton	L. F.	85.30 86.66	0.80 0.59	13.80 12.73	0.10 0.02	80.00 80.00	4/1942 6/1942	
1042	JOHN D. LYON, INC., Belmont, Mass. Kentucky Middlesex County Farm Bureau Assoc., Lowell	L. F.	87.00 86.24	0.20 0.19	12.60 13.52	0.20 0.05	81.00 84.00	2/1942 6/1942	
1130	Kentucky F. Diehl & Sons, Wellesley	L. F.	87.11 84.80	0.20 0.20	12.50 14.90	0.19 0.10	80.00 60.00†	1/1942 6/1942	
508	SEARS, ROEBUCK AND CO., Springfield, Mass. Kentucky, No. K-123	L. F.	85.00 84.32	0.40 0.65	14.60 14.24	— 0.19	80.00 77.00	1/1942 5/1942	
898	WHITNEY SEED CO., Buffalo, N. Y. Canada, No. 3000 Frank Howard, Inc., Pittsfield	L. F.	88.50 82.59†	0.10 0.09	11.20 13.17	0.20 4.15	85.00 87.00	2/1942 8/1942	
1122	Fancy Kentucky, No. 36523 R. P. Swan, Stoughton	L. F.	85.47 87.61	0.17 0.30	14.36 12.09	— —	85.00 79.00	2/1942 6/1942	
735	F. H. WOODRUFF & SONS, Milford, Conn. Kentucky, No. G 53-8 New Style Hardware Co., Roslindale	L. F.	85.39 84.20	0.10 0.10	14.51 15.66	— 0.04	88.00 85.00	1/1942 6/1942	
BUCKWHEAT									
1147	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Japanese, No. 902 Eastern States Farmers' Exchange, Fitchburg	L. F.	99.50 99.91	— —	0.50 0.09	Trace —	93.00 97.00	12/1942 7/1942	
1165	Selected, No. 6981 Templeton Farmers Cooperative Association, Inc., Templeton	L. F.	99.00 99.57	0.10 —	0.55 0.23	0.35 0.20	93.00 96.00	4/1942 7/1942	

† Indicates purity below, germination below, or excessive weed seed, depending upon column in which it is found.

(C) Small percentage of purple stained seed, indicating Canadian origin.

(m) Given formula totals more than 100%.

* Information required by law not given.

(a) Noxious Weeds not declared but found excessive.

(a) 22 English Plantain

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date Test	Notes	Noxious Weed Seeds per Ounce
BUCKWHEAT—Concluded									
902	LARROWE BUCKWHEAT FLOUR CORPORATION, Cohocton, N. Y. Buckwheat, No. 11729 Frank Howard, Inc., Pittsfield	99.66 L. 99.97 F.	0.02 —	0.30 0.03	— —	97.00 97.00	3/1942 7/1942		
1040	JOHN D. LYON, INC., Belmont, Mass. Buckwheat, Middlesex County Farm Bureau Assoc., Lowell	98.00 L. 99.46 F.	0.50 —	1.50 0.29	— 0.25	90.00 98.00	4/1942 7/1942		
ALSIKE CLOVER									
352	WM. G. SCARLETT & CO., Baltimore, Md. Alsike, No. 23487 C. P. Washburn Co., Middleboro	97.00 L. 97.00 F.	0.20 0.18	1.40 1.70	1.40 1.12	90.00 88-9	3/1942 8/1942		
569	STANFORD SEED CO., Buffalo, N. Y. The Warren Grain Co., Warren	97.55 L. 98.50 F.	0.15 0.29	0.35 0.10	1.95 1.11	80-12 86-8	2/1942 8/1942		
1167	Alsike, No. 3577 W. N. Potter Grain Stores, Athol	98.90 L. 98.80 F.	0.15 0.53	0.35 0.40	0.60 0.27	77-19 75-22	3/1942 8/1942		
LADINO CLOVER									
903	GRAVER-DICKINSON CO., Buffalo, N. Y. Ladino, No. 26-259 Frank Howard, Inc., Pittsfield	99.39 L. 99.48 F.	0.21 0.08	0.09 0.16	0.31 0.28	90-2 93-7	3/1942 8/1942		
1163	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Ladino, No. 5301 Templeton Farmers Cooperative Association, Inc., Templeton	99.40 L. 99.49 F.	0.10 0.09	0.40 0.23	0.10 0.09	85-10 92-6	2/1942 8/1942	(a)	28 English Plantain
1043	JOHN D. LYON, INC., Belmont, Mass. Ladino, Middlesex County Farm Bureau Assoc., Lowell	99.84 L. 99.89 F.	Trace Trace	0.12 0.11	— —	93-3 94-1	2/1942 8/1942		
357	WM. G. SCARLETT & CO., Baltimore, Md. Ladino, No. 1656 C. P. Washburn Co., Middleboro	96.10 L. 97.27 F.	0.70 0.23	0.60 0.42	2.60 2.08	70-20 76-24	2/1942 8/1942		

RED CLOVER

ARTHUR R. CONE, Buffalo, N. Y.									180 English Plantain per lb.
371F Medium, No. 15-391.....	L.	99.00	0.30	0.20	0.50	75-10	1/1942	7 English Plantain and 1 Dodder per oz.	
Farm Service Co., Middleboro	F.	99.27	0.08	0.12	0.53	80-16	8/1942		
1013F Medium Red, No. 15-406.....	L.	99.25	0.20	0.35	0.20	80-10	3/1942		
Sunshine Feed Store, Westfield	F.	99.51	0.14	0.12	0.23	86-8	8/1942		
1026F Medium Red, No. 15-391.....	L.	99.00	0.30	0.20	0.50	75-10	1/1942	180 English Plantain per lb.	
Farm Service Co., Hudson	F.	99.18	0.09	0.12	0.61	80-17	8/1942	7 English Plantain per oz.	
1112 Medium Red, No. 15-334.....	L.	99.50	0.16	0.17	0.17	86-5	1/1941		
Mansfield Milling Co., Mansfield	F.	99.54	0.10	0.28	0.08	94-1	8/1942		
CRAVER-DICKINSON CO., Buffalo, N. Y.									
900F Medium Red, No. 24-588.....	L.	99.51	0.11	0.28	0.10	90-5	3/1942		
Frank Howard, Inc., Pittsfield	F.	99.69	0.06	0.12	0.13	92-3	8/1942		
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.									
554F Medium Red, No. 932.....	L.	99.30	0.18	0.24	0.28	75-18	12/1941		
Eastern States Farmers' Exchange, Northampton	F.	99.26	0.29	0.14	0.31	82-12	8/1942		
JOSEPH HARRIS CO. INC. Rochester, N. Y.									
185F Medium Red, No. 2264.....	L.	99.72	0.02	0.10	0.16	87-11	1/1942		
Joseph Harris Co., Inc., Cambridge	F.	99.41	0.22	0.08	0.29	88-8	5/1942	(a) 14 English Plantain	
JOHN D. LYON, INC., Belmont, Mass.									
463F Medium Red, No. 9563.....	L.	99.32	—	0.08	0.53	85-10	4/1941		
Middlesex County Farm Bureau Assoc., Worcester	F.	99.39	0.11	0.23	0.27	91-3	8/1942		
ROSS BROS. CO., Worcester, Mass.									
305F Medium Red, No. A 271.....	L.	99.50	0.15	0.25	0.25	74-17	1/1942		
F.	F.	99.66	0.12	0.12	0.10	85-7	8/1942		
WM. G. SCARLETT & CO., Baltimore, Md.									
351F Medium Red, No. 23738.....	L.	99.50	0.20	0.30	—	85-5	3/1942		
C. F. Washburn Co., Middleboro	F.	99.57	0.08	0.09	0.26	79-5	8/1942		
516F Red, No. 9777.....	L.	99.50	0.40	0.10	—	90.00	1/1942	28 English Plantain	
Waite Hardware Co., Webster	F.	99.60	0.23	0.15	0.02	86-9	8/1942	31 English Plantain	

(a) Noxious Weeds not declared but found excessive.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test	Notes	Noxious Weed Seeds per Ounce
RED CLOVER—Concluded									
639F	Red, No. 1785. L. M. Johnson, Reading	L. 99.50 F. 99.40	0.20 0.11	0.30 0.49	—	80-10 77-8	3/1942 8/1942		
STANFORD SEED CO., Buffalo, N. Y.									
427F	Medium Red, No. 3047. Milford Grain Co., Milford	L. 99.80 F. 99.83	0.05 0.09	0.05 0.04	0.10 0.04	92-3 91.00	3/1941 8/1942		
555F	Medium Red No. 6249. W. N. Potter Grain Stores, Inc., Northampton	L. 99.25 F. 99.27	0.20 0.11	0.20 0.36	0.32 0.26	82-10 91-3	3/1942 8/1942		
568F	Medium Red, No. 6219. The Warren Grain Co., Warren	L. 99.02 F. 99.27	0.32 0.46	0.10 0.08	0.56 0.19	82-10 90-6	2/1942 8/1942		
WHITNEY SEED CO., Buffalo, N. Y.									
172F	Medium Red, No. 50541 W. G. Pearse Co., Fall River	L. 99.24 F. 99.40	0.03 0.22	0.06 0.02	0.40 0.36	81-11 85-14	2/1942 8/1942		
488F	Medium Red, No. 50519. The Burnham Co., Holyoke	L. 99.76 F. 97.60	0.09 1.24†	0.12 0.17	0.03 0.99	75-10 78-13	1/1942 8/1942	(a)	9 English Plantain 2 Brassica spp.
971F	Domestic Med. Red. Checkerboard Feed Store, Pittsfield	L. 99.25 F. 99.11	0.38 0.51	0.15 0.13	0.22 0.25	80-4 83-5	4/1942 8/1942	(a)	34 English Plantain
UNKNOWN									
803F	Medium Red, No. 1563. Plymouth Rock Hardware Co., Plymouth	L. 99.42 F. 98.72	0.16 0.23	— 0.40	— 0.65	74-17 1.00†	1/1942 8/1942	(a)(E)	16 English Plantain 6 Brassica spp.
WHITE CLOVER									
JOSEPH BRECK & SONS, Boston, Mass.									
1030	White Clover. Vanderhoof's Hardware, Concord	L. 96.38 F. 97.78	0.30 0.17	0.33 0.18	2.99 1.87	72-24 70-27	*/* 8/1941		
701	S. S. KRESGE CO., Detroit, Mich. White Clover, No. 1599. S. S. Kresge Co., Boston	L. 98.00 F. 98.15	0.49 0.63	1.51 0.39	— 0.83	80.00 74-11	2/1941 8/1942	*	English Plantain 49 English Plantain

1041	JOHN D. LYON, INC., Belmont, Mass. White Clover..... Middlesex County Farm Bureau Assoc., Lowell	L. F.	97.30 96.58	0.50 0.19	0.35 0.42	1.85 2.81	75-16 65-33†	2/1942 8/1942	
227	PEDIGREED SEED CO., New York, N. Y. White Clover, No. AMS-41..... Franklin Hardware Co., No. Attleboro	L. F.	98.24 97.45	0.10 0.05	1.26 0.25	0.40 2.25	85.00 56-39†	2/1942 8/1942	(c)
933	STANFORD SEED CO., Buffalo, N. Y. White, No. 3951..... Platt & Goslee, Great Barrington	L. F.	99.40 99.12	0.35 0.39	0.10 0.05	0.15 0.44	90-2 99-1	3/1942 8/1942	
627	WHITNEY ECKSTEIN SEED CO., Buffalo, N. Y. White Clover, No. 6124..... Guy L. Harvey Hardware Stores, Inc., Jamaica Plain	L. F.	98.75 97.53†	0.50 0.34	0.35 0.53	0.40 1.00	79-12 70-3†	1/1940 9/1942	(A) (a)
842	F. H. WOODRUFF & SONS, Milford, Conn. Fancy White Clover..... Atlantic Distributing Co., Lowell	L. F.	96.90 95.23†	0.45 2.97†	0.70 1.36	1.95 0.44	76.00 49-10†	2/1942 8/1942	450 English Plantain per lb. 4 English Plantain per oz. 72 Dodder
1011	ARTHUR R. CONE, Buffalo, N. Y. West Branch Sweepstakes Type No. 80-718..... Sunshine Feed Store, Westfield	L. F.	99.50 99.65	0.10 —	0.40 0.35	— —	90.00 95.00	1/1942 6/1942	**
1109	Yellow Sweepstakes Type, No. 80-757..... Mansfield Milling Co., Mansfield	L. F.	99.50 99.71	0.10 —	0.40 0.29	— —	90.00 89.00	3/1942 6/1942	**
1157	West Branch Sweepstakes, No. 80-725..... Farm Service Stores, Gardner	L. F.	99.50 99.47	0.10 —	0.40 0.53	— —	90.00 90.00	2/1942 6/1942	
969	CRAYER-DICKINSON SEED CO., Buffalo, N. Y. 8 Row Flint, No. 72-27..... Pittsfield Grain Co., Pittsfield	L. F.	99.00 99.96	— —	1.00 0.04	— —	92.00 89.00	2/1942 6/1942	

† Indicates purity below, germination below, or excessive weed seed, depending upon column in which it is found.

(a) Noxious Weeds not declared but found excessive.

(b) Small percentage of green stained seed, indicating Northern European origin.

* Information required by law not given.

(c) Hard Seed and Germination of Clover added together in Guarantee.

(A) This seed house is no longer in business.

** Variety required by law but not stated.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Notes	Noxious Weed Seeds per Ounce
CORN—Concluded									
970	DELTA SALES CO., Delta, Pa. Enslage Kato Corn, Pittsfield Grain Co., Pittsfield	L. 98.00 F. 99.93	—	2.00 0.07	—	90.00 93.00	2/1942 6/1942		
1164	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Hybrid Indiana 608, No. 944, Templeton Farmers' Cooperative Association, Inc., Templeton	L. 99.25 F. 99.83	—	0.75 0.17	—	95.00 98.00	12/1941 6/1942	(c)	
1036	JOHN D. LYON, INC., Belmont, Mass. Westbranch Sweepstakes, No. 7-3170, Middlesex County Farm Bureau, Lowell	L. 99.00 F. 99.87	—	1.00 0.13	—	90.00 83.00†	1/1942 6/1942		
931	PAGE SEED CO., Greene, N. Y. Page's Early Canada Flint, No. 2115, Platt & Goslee, Great Barrington	L. 99.00 F. 99.87	—	— 0.13	—	90.00 97.00	4/1942 6/1942		
932	Page's Golden Beauty, No. 2090-1, Platt & Goslee, Great Barrington	L. 99.00 F. 99.76	—	— 0.24	—	90.00 94.00	4/1942 6/1942		
389	GEORGE R. PEDRICK & SONS, Pedricktown, N. J. Yellow Sweepstakes, The Continental Nurseries, Franklin	L. 99.00 F. 99.93	—	1.00 0.07	—	92.00 97.00	1/1942 6/1942		
376	WM. G. SCARLETT & CO., Baltimore, Md. Delaware Yellow Sweepstakes, No. 23756, W. K. Gilmore & Sons, Inc., Medfield	L. 98.00 F. 99.64	0.20	1.80 0.36	—	90.00 95.00	2/1942 6/1942		
390	Pa. Red Sweepstakes, No. 1738, The Continental Nurseries, Franklin	L. 98.00 F. 99.68	0.20	1.80 0.32	—	90.00 97.00	3/1942 6/1942		
1142	STANFORD SEED CO., Buffalo, N. Y. Leaming, No. 4073, United Cooperative Farmers', Inc., Fitchburg	L. 99.00 F. 99.53	—	1.00 0.47	—	91.00 92.00	3/1942 6/1942		
1169	Westbranch Sweepstakes, No. 602, W. N. Potter Grain Stores, Athol	L. 99.00 F. 99.86	—	1.00 0.14	—	90.00 96.00	2/1942 6/1942		
1086	S. D. WOODRUFF & SONS, Orange, Conn. Woodruff's Beauty Corn, Herman F. Davis, Merrimac	L. * F. 99.53	—	— 0.47	—	90.00 98.00	** 6/1942		

CHEWINGS FESCUE

1125	ENGBRETSON SEED CO., Astoria, Oregon Oregon 6, F 60 New England Toro Co., West Newton	L. 98.88 F. 98.86	0.36 0.22	0.63 0.88	0.13 0.04	94.55 93.00	3/1942 6/1942
1089	JOHN D. LYON, INC., Belmont, Mass. Chewing s. Middlesex County Farm Bureau Assoc., Lowell	L. 99.82 F. 99.26	— —	0.18 0.74	— Trace	90.00 96.00	2/1942 6/1942

MANGELS

1121	JOSEPH BRECK & SONS, Boston, Mass. Wurzel, Breck's Mammoth Long Red, No. B144 Bell Hardware Co., Stoneham	L. 95.00 F. 99.89	— —	— 0.11	— —	73.00 83.00	1/1942 6/1942
310	W. ATLEE BURPEE CO., Philadelphia, Pa. Mammoth Prize Long Red, No. 23728 S. Allen's Sons, Greenfield	L. * F. 96.99	— —	— 3.01	— —	80.00 68.00†	1/1942 5/1942
1044	THOMAS W. EMERSON CO., Beverly, Mass. Mammoth Long Red, No. 73A Thompson Hardware Co., Lowell	L. * F. 99.67	— 0.06	— 0.27	— —	* 71.00	*/* 6/29/42
373	CHARLES C. HART SEED CO., Wethersfield, Conn. Giant Long Red W. K. Gilmore & Sons, Inc., Medfield	L. * F. 99.64	— —	— 0.36	— —	90.00 84.00	12/1942 5/1942
559	D. LANDRETH SEED CO., Bristol, Pa. Mammoth Long Red Frank L. Whitcomb, Amherst	L. * F. 99.31	— —	— 0.69	— —	75.00 88.00	*/* 5/1942
573	ROSS BROS. CO., Worcester, Mass. Mammoth Long Red A. S. Tucker, Hardware, Warren	L. 98.90 F. 99.20	— —	1.10 0.80	— —	80.00 76.00	1/1942 8/1942
195	F. H. WOODRUFF & SONS, Milford, Conn. Mammoth Long Red, No. 9-3108 Middlesex County Farm Bureau Assoc., Waltham	L. 99.00 F. 98.30	— —	1.00 1.70	— —	90.00 94.00	12/1941 5/1942

HUNGARIAN MILLET

250	ARTHUR R. COONE, Buffalo, N. Y. Hungarian, No. 38-213 Sunshine Feed Stores, Bridgewater	L. 98.50 F. 98.65	0.60 1.09†	0.40 0.26	0.50 —	85.00 83.00	1/1942 4/1942
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(c) Wholesaler claims seed not sold by him, at least not during current year.

† Indicates purity below, germination below, or excessive weed seed, depending upon column in which it is found.

* Information required by law not given.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Notes	Noxious Weed Seeds per Ounce
HUNGARIAN MILLET—Concluded									
360	WM. G. SCARLETT & CO., Baltimore, Md. Hungarian, No. 22488. C. P. Washburn Co., Middleboro	L. 99.00 F. 99.49	0.50 0.12	0.50 0.39	— —	55.00 49.00	11/1941 8/1942		
566	STANFORD SEED CO., Buffalo, N. Y. Hungarian, No. 6181. Warren Grain Co., Warren	L. 99.04 F. 99.25	0.52 0.57	0.44 0.15	— 0.03	80.00 75.00	2/1942 8/1942		
1140	WHITNEY SEED CO., Buffalo, N. Y. Hungarian, No. 48-3. United Cooperative Farmers', Inc., Fitchburg	L. 99.32 F. 99.14	0.50 0.70	0.14 0.16	0.04 —	87.00 89.00	4/1942 8/1942		
JAPANESE MILLET									
1048	APOTHECARIES HALL CO., Waterbury, Conn. Japanese, No. G 109-17. Methuen Grain Co., Methuen	L. 97.68 F. 97.50	2.10 1.99	0.14 0.49	— 0.02	85.00 80.00	3/1941 8/1942		
251	ARTHUR R. CONE, Buffalo, N. Y. Japanese, No. 38-243. Sunshine Feed Stores, Bridgewater	L. 98.98 F. 98.85	0.95 1.13	0.07 0.02	— —	85.00 97.00	1/1942 4/1942		
1137	Japanese, No. 38-231. United Cooperative Farmers', Inc., Fitchburg	L. 98.25 F. 97.31	1.71 2.60†	0.04 0.09	— —	85.00 90.00	10/1941 8/1942	(a)	8 Brassica spp.
1156	Japanese, No. 38190. Farm Service Stores, Gardner	L. 97.00 F. 96.61	2.75 3.37	0.08 0.02	0.17 —	85.00 86.00	2/1941 8/1942		
968	CRAYER-DICKINSON CO., Buffalo, N. Y. Japanese, No. 81-8. Pittsfield Grain Co., Pittsfield	L. 98.12 F. 98.09	1.80 1.83	0.06 0.02	0.02 0.06	88.00 91.00	1/1942 8/1942	(a)	12 Brassica spp.
1152	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Japanese, No. 5542. Eastern States Farmers' Exchange, Fitchburg	L. 98.80 F. 98.58	1.00 1.35	0.20 0.07	Trace —	90.00 95.00	5/1942 8/1942		
1035	JOHN D. LYON, INC., Belmont, Mass. Japanese. Middlesex County Farm Bureau Assoc., Lowell	L. 99.00 F. 98.25	0.94 1.66†	0.04 0.09	0.02 Trace	94.00 97.00	1/1942 8/1942		

387	WM. G. SCARLETT & CO., Baltimore, Md. Japanese, No. 28095..... The Continental Nurseries, Franklin	L. F.	97.00 98.39	2.50 1.16	0.50 0.25	— —	90.00 92.00	11/1941 8/1942	
565	STANFORD SEED CO., Buffalo, N. Y. Japanese, No. 6112..... Warren Grain Co., Warren	L. F.	97.50 96.70	2.34 3.18	0.16 0.12	— —	93.00 87.00	3/1942 8/1942	
1168	Japanese, No. 6237..... W. N. Potter Grain Stores, Athol	L. F.	98.01 97.60	1.90 2.27	0.09 0.13	— —	90.00 95.00	3/1942 8/1942	
487	WHITNEY SEED CO., Buffalo, N. Y. Japanese, No. 466..... The Burnham Co., Holyoke	L. F.	97.50 95.78†	2.06 4.06†	0.40 0.16	0.04 Trace	85.00 95.00	12/1941 8/1942	
OATS									
489	BERKSHIRE COAL & GRAIN CO., No. Adams, Mass. Liberty, Variety Unknown..... The Burnham Co., Holyoke	L. F.	98.00 99.02	0.01 0.01	0.22 0.15	0.90 0.82	97.00 94.00	3/1942 (X) 8/1942	
84	JOSEPH BRECK & SONS, Boston, Mass. Breck's King Oats A Victory Type No. C356.....	L. F.	99.20 99.49	— —	0.25 0.08	0.55 0.43	98.00 93.00	2/1942 ** 8/1942	
386	THE CLEVELAND GRAIN CO., Cleveland, Ohio No. 1 White, Variety Unknown..... The Continental Nurseries, Franklin	L. F.	98.00 99.41	0.15 —	0.15 0.11	1.00 0.48	97.00 94.00	1/1942 (X) 8/1942	
965	CHARLES M. COX CO., Boston, Mass. Winchmore Brand, Variety Unknown..... The Pitsfield Grain Co., Pitsfield	L. F.	96.50 99.00	1.80 0.04	0.20 0.16	1.50 0.80	95.00 92.00	1/1942 (X) 8/1942	
462	THE O & M SEED CO., Green Springs, Ohio Oats, No. 188..... Middlesex County Farm Bureau Assoc., Worcester	L. F.	99.00 99.76	0.15 —	0.35 0.24	0.50 —	93.00 93.00	1/1942 ** 8/1942	
955	H. C. PUFFER CO., Springfield, Mass. Oats..... H. C. Puffer Co., Huntington	L. F.	98.00 97.72	0.01 0.02	— 0.42	— 1.84	94.00 91.00	4/1942 ** 8/1942	

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(a) Noxious Weeds not declared but found excessive.

(X) Variety is required by law; but when variety is unknown, the State Department of Agriculture will accept the statement "Variety Unknown" for the years 1942 and 1943.

** Variety required by law but not stated.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Notes	Noxious Weed Seeds per Ounce
OATS—Concluded									
486	RALSTON PURINA CO., St. Louis, Mo. Selected Swedish Type, Variety Unknown. Checkerboard Feed Store, Amherst	L. 98.00 F. 98.80	0.30 —	0.50 0.24	1.00 0.96	93.00 89.00	3/1942 8/1942	(X)	
1017	Selected Swedish Type, Variety Unknown. Checkerboard Feed Store, Westfield	L. 98.00 F. 99.18	0.30 —	0.50 0.62	1.50 0.20	92.00 93.00	2/1942 8/1942	(X)	
1018	Victory, No. 5 V. Checkerboard Feed Store, Westfield	L. 99.00 F. 99.82	0.10 —	0.25 0.01	0.40 0.10	90.00 93.00	3/1942 8/1942		
ORCHARD GRASS									
515	WM. G. SCARLETT & CO., Baltimore, Md. Orchard Grass, No. 233-43 Waite Hardware Co., Webster	L. 85.00 F. 89.32	2.20 1.89	13.80 8.14	— 0.05	80.00 90.00	3/1942 5/1942	(a)	39 English Plantain
PEAS									
388	WM. G. SCARLETT & CO., Baltimore, Md. Canada, No. 7962. The Continental Nurseries, Franklin	L. 98.00 F. 99.86	0.20 —	1.80 0.10	— 0.04	88.00 90.00	2/1942 7/1942		
1166	STANFORD SEED CO., Buffalo, N. Y. Canada, No. 3783. W. N. Potter Grain Store, Athol	L. 99.00 F. 99.91	— —	1.00 0.09	— —	90.00 84.00	2/1942 7/1942		
RAPE									
604	COMSTOCK, FERRE & CO., Wethersfield, Conn. Dwarf Essex, No. 1371. Central Hardware Co., Woburn	L. 99.50 F. 99.90	0.12 0.03	— 0.07	— —	95.00 96.00	1/1942 7/1942		
355	WM. G. SCARLETT & CO., Baltimore, Md. Dwarf Essex, No. 577. C. P. Washburn Co., Middleboro	L. 99.00 F. 99.82	0.20 —	0.80 0.18	— —	90.00 96.00	1/1942 7/1942		
1138	WHITNEY SEED CO., Buffalo, N. Y. Dwarf Essex, No. 9611. United Cooperative Farmers, Inc., Fitchburg	L. 99.00 F. 99.86	0.30 —	0.35 0.14	0.35 —	92.00 98.00	1/1942 7/1942		
1066	F. H. WOODRUFF & SONS, Milford, Conn. Dwarf Essex, No. 129-7. Haverhill Hardware & Plumbing Supply Co., Haverhill	L. 99.59 F. 98.86	— 0.02	0.41 1.11	— 0.01	91.00 82.00†	3/1942 7/1942		

REDTOP

899	ASSOCIATED SEED GROWERS, INC., New Haven, Conn. Redtop, No. 48802..... Frank Howard, Inc., Pittsfield.....	L. F.	98.00 97.14	0.40 0.43	1.60 2.43	— Trace	90.00 92.00	1/1942 7/1942
987	Redtop, No. 42210..... Phillips General Store, Williamstown.....	L. F.	98.00 96.85†	0.40 0.50	1.60 2.65	— Trace	90.00 90.00	1/1942 8/1942
1023	ARTHUR R. CONE, Buffalo, N. Y. Redtop, No. 30-111..... Farm Service Co., Hudson.....	L. F.	94.00 93.91	0.36 0.44	5.00 5.59	0.64 0.06	90.00 90.00	2/1942 8/1942
1050	ALBERT DICKINSON CO., Chicago, Ill. Redtop, No. 4125..... Methuen Grain Co., Methuen.....	L. F.	93.20 93.70	0.80 0.76	5.60 3.44	0.40 0.10	92.00 91.00	12/1941 7/1942
1136	Redtop, No. 4125..... United Cooperative Farmers, Inc., Fitchburg.....	L. F.	93.20 88.22†	0.80 1.12	5.60 10.41	0.40 0.25	92.00 90.00	12/1941 8/1942
1148	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Redtop, Fancy Solid, No. 4801..... Eastern States Farmers' Exchange, Fitchburg.....	L. F.	98.10 98.11	0.25 0.28	1.50 1.44	0.15 0.17	90.00 85.00	12/1941 8/1942
636	CHARLES C. HART SEED CO., Wethersfield, Conn. Redtop, No. C-88-A..... Fred C. Smith, Inc., Reading.....	L. F.	98.00 97.84	0.18 0.14	1.79 2.02	— —	90.00 91.00	11/1941 8/1942
1037	JOHN D. LYON, INC., Belmont, Mass. Redtop, Fancy, No. C-108..... Middlesex County Farm Bureau Assoc., Lowell.....	L. F.	92.13 90.72	0.48 0.65	7.24 8.63	0.15 Trace	94.00 95.00	2/1942 7/1942
1132	Redtop..... F. Diehl & Son, Inc., Wethersley.....	L. F.	91.34 89.36	0.72 0.50	7.85 9.82	0.09 0.12	94.00 90.00	2/1942 8/1942
519	WM. G. SCARLETT & CO., Baltimore, Md. Redtop, No. 312..... Waite Hardware Co., Webster.....	L. F.	92.00 94.61	0.50 0.64	6.50 4.24	1.00 0.51	90.00 95.00	2/1942 5/1942
640	Redtop, No. 462..... L. M. Johnson, Reading.....	L. F.	93.50 94.79	1.00 0.57	5.50 4.60	— 0.01	90.00 94.00	12/1941 8/1942
564	STANFORD SEED CO., Buffalo, N. Y. Redtop, No. 3702..... The Warren Grain Co., Warren.....	L. F.	92.83 91.39	0.78 1.06	5.69 6.60	0.70 0.95	92.00 94.00	2/1942 8/1942

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(a) Noxious Weeds not declared but found excessive.

† Indicates purity below, germination below, or excessive weed seed, depending upon column in which it is found.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test	Notes	Noxious Weed Seeds per Ounce
REDTOP—Concluded									
377	WHITNEY SEED CO., Buffalo, N. Y. Redtop, Extra Fancy, No. 40613 Millis Coal & Grain Co., Millis	L. 98.00 F. 97.57	0.30 0.26	1.60 2.17	0.10 Trace	92.00 94.00	3/1942 8/1942		
1124	Pan American, No. 40516 R. P. Swan, Sloughston	L. 94.70 F. 94.75	0.40 0.40	4.60 4.79	0.30 0.06	95.00 93.00	2/1942 8/1942		
734	F. H. WOODRUFF & SONS, Milford, Conn. Redtop, Fancy, No. G 67-229 New Style Hardware, Roslindale	L. 92.13 F. 91.83	1.07 1.24	6.60 6.81	0.20 0.12	90.00 91.00	2/1942 8/1942		
1087	S. D. WOODRUFF & SONS, Orange, Conn. Redtop, No. M6020 Herman F. Davis, Merrimac	L. 90.25 F. 90.03	1.47 1.51	8.18 8.31	0.10 0.15	91.00 95.00	1/1942 8/1942		
RYE									
248	ARTHUR R. CONE, Buffalo, N. Y. Rosen, No. 85-129 Sunshine Feed Stores, Bridgewater	L. 97.00 F. 99.40	0.40 0.01	1.00 0.51	1.60 0.08	85.00 67.00†	1/1942 8/1942		
1162	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Winter Rosen, No. 3531 Templeton Farmers' Cooperative Association, Inc., Templeton	L. 98.00 F. 99.93	0.05 —	1.80 0.06	0.15 0.01	85.00 86.00	12/1941 8/1942		
353	W. M. G. SCARLETT & CO., Baltimore, Md. Spring Rye, No. 1599 C. P. Washburn Co., Middleboro	L. 96.00 F. 98.34	0.20 0.03	3.30 0.90	0.50 0.73	85.00 83.00	1/1942 8/1942	**	
RYEGRASS									
807	ASSOCIATED SEED GROWERS, INC., New Haven, Conn. Domestic, No. 48330 Frank Howard, Inc., Pittsfield	L. 99.50 F. 99.56	0.20 0.12	0.30 0.32	— —	90.00 97.00	1/1942 8/1942		
83	JOSEPH BRECK & SONS, Boston, Mass. English Perennial, No. G 442-202	L. 99.05 F. 99.39	0.02 0.42†	0.08 0.19	0.85 —	95.00 96.00	1/1942 4/1942		
1151	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Domestic, No. 4841 Eastern States Farmers' Exchange, Fitchburg	L. 98.75 F. 99.37	0.15 0.12	1.00 0.50	0.10 0.01	90.00 92.00	3/1942 8/1942		

1038	JOHN D. LYON, INC., Belmont, Mass. Domestic, No. 10574 Middlesex County Farm Bureau Assoc., Lowell	L. F.	99.80 99.19	0.08 0.24	0.12 0.57	— —	92.00 92.00	2/1942 8/1942	
545	WHITNEY SEED CO., Buffalo, N. Y. Perennial, No. 43-6 Belmont Hardware Co., Springfield	L. F.	99.46 99.28	0.26 0.26	0.26 0.39	0.02 0.07	96.00 96.00	3/1942 5/1942	
732	F. H. WOODRUFF & SONS, Milford, Conn. Common, No. J 40-218 New Style Hardware Co., Roshdale	L. F.	99.80 99.83	0.08 —	0.02 0.07	— —	* 90.00	1/1942 8/1942	
SOY BEANS									
1025	ARTHUR R. CONE, Buffalo, N. Y. Manchu, No. 42-180 Farm Service Co., Hudson	L. F.	99.00 99.72	0.10 —	0.90 0.28	— —	90.00 71.00†	2/1942 7/1942	
901	CRAVER-DICKINSON CO., Buffalo, N. Y. Manchu, No. 84-14 Frank Howard, Inc., Pittsfield	L. F.	98.50 99.02	0.25 —	1.25 0.26	— 0.72	85.00 85.00	3/1942 7/1942	
1150	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Cayuga, No. 953 Eastern States Farmers' Exchange, Fitchburg	L. F.	99.50 99.84	— —	0.50 0.16	Trace —	88.00 82.00	2/1942 7/1942	
SUDAN GRASS									
1149	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Sudan Grass, No. 945 Eastern States Farmers' Exchange, Fitchburg	L. F.	98.25 99.21	0.15 0.03	1.50 0.75	0.10 0.01	88.00 82.00	12/1941 7/1942	
TIMOTHY									
1139	APOTHECARIES HALL CO., Waterbury, Conn. Timothy, No. 66891 United Cooperative Farmers, Inc., Fitchburg	L. F.	99.70 99.77	0.05 0.05	0.15 0.14	0.10 0.04	88.00 71.00†	1/1942 8/1942	
249	ARTHUR R. CONE, Buffalo, N. Y. Arco, No. 10-300 Sunshine Feed Store, Bridgewater	L. F.	99.80 99.61	0.04 0.05	0.10 0.24	0.06 0.10	90.00 96.00	2/1942 4/1942	
1024	Arco, No. 10-357 Farm Service Co., Hudson	L. F.	99.62 99.66	0.06 0.15	0.25 0.14	0.07 0.05	90.00 82.00†	1/1942 7/1942	

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** Variety required by law but not stated.

* Information required by law not given.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand or Trade Name of Seed, Dealer when Other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Notes	Noxious Weed Seeds per Ounce
TIMOTHY—Concluded									
635	CHARLES C. HART SEED CO., Wethersfield, Conn. Timothy..... Fred F. Smith, Inc., Reading	L. 99.50 F. 99.70	0.05 0.05	0.35 0.20	0.10 0.05	83.00 89.00	1/1942 8/1942		
1034	JOHN D. LYON, INC., Belmont, Mass. Timothy..... Middlesex County Farm Bureau Assoc., Lowell	L. 99.43 F. 99.62	0.17 0.04	0.45 0.19	0.02 0.15	91.00 86.00	2/1942 8/1942		
358	WM. G. SCARLETT & CO., Baltimore, Md. Timothy, No. 23466..... C. P. Washburn Co., Middleboro	L. 99.60 F. 99.73	0.20 0.09	0.20 0.14	— 0.04	82.00 80.00	2/1942 5/1942		
641	Timothy, No. 550..... L. M. Johnson, Reading	L. 99.60 F. 99.57	0.10 0.04	0.30 0.31	— 0.08	90.00 94.00	2/1942 8/1942		
567	STANFORD SEED CO., Buffalo, N. Y. Timothy, No. 3570..... The Warren Grain Co., Warren	L. 99.65 F. 99.85	0.05 —	0.25 0.05	0.05 —	90.00 92.00	2/1942 8/1942		
733	F. H. WOODRUFF & SONS, Milford, Conn. Woodco, No. G 330-224..... New Style Hardware Co., Roslindale	L. 99.61 F. 99.22	0.05 0.05	0.24 0.53	— 0.20	90.00 87.00	1/1942 8/1942		
960	Woodco, No. G 330-223..... E. A. Noble & Co., Stockbridge	L. 99.60 F. 99.83	0.18 0.04	0.16 0.13	0.06 —	90.00 87.00	3/1942 8/1942		
VETCH									
1110	ARTHUR R. CONE, Buffalo, N. Y. Winter, No. 43-81..... Mansfield Milling Co., Mansfield	L. 98.50 F. 99.82	— 0.06	1.00 0.07	0.50 0.05	88.00 75-17†	7/1941 7/1942		
1033	JOHN D. LYON, INC., Belmont, Mass. Hay..... Middlesex County Farm Bureau Assoc., Lowell	L. 97.75 F. 99.06	0.40 —	0.60 0.05	1.25 0.89	86.00 85-11	3/1942 7/1942		
356	WM. G. SCARLETT & CO., Baltimore, Md. Spring or Common, No. 8452..... C. P. Washburn Co., Middleboro	L. 97.50 F. 98.89	0.25 0.01	0.25 0.12	2.00 0.98	90.00 99.00	1/1942 5/1942		

1141	WHITNEY SEED CO., Buffalo, N. Y. Spring, No. 6713..... United Cooperative Farmers, Inc., Fitchburg	L. F.	95.95 95.89	— —	0.26 0.11	3.78 4.00	90.00 98.00	1/1942 7/1942	
87	JOSEPH BRECK & SONS, Boston, Mass. Spring, No. C 288.....	L. F.	99.38 99.29	0.01 0.03	0.43 0.55	0.18 0.13	94.00 93.00	1/1942 8/1942	**
1111	ARTHUR R. CONE, Buffalo, N. Y. Winter, 60-83..... Mansfield Milling Co., Mansfield	L. F.	98.50 99.89	0.50 —	1.00 0.11	— —	88.00 98.00	3/1941 8/1942	**
1170	STANFORD SEED CO., Buffalo, N. Y. Spring, Marquis, No. 4122..... W. N. Potter Grain Stores, Athol	L. F.	99.82 99.87	— —	0.13 0.13	0.05 —	96.00 96.00	3/1942 8/1942	

** Variety required by law but not stated.

† Indicates purity below, germination below, or excessive weed seed, depending upon column in which it is found.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when Other than Wholesale Distributor, and Place Collected	Ingredients, %		Germination, %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Notes	Noxious Weed Seeds per Ounce
		Label	Found	Label	Found							
MIXTURES												
SECTION 261-B—Not More than Two Kinds of Agricultural Seed												
920	STANFORD SEED CO., Buffalo, N. Y. Timothy, No. 3551*—Found to be a Mixture. Arthur W. Baldwin, West Stockbridge					L. 99.65 F. 98.85	0.05 0.13	0.25 0.85	0.05 0.17	3/1942 8/1942	(k)	
	Ingredients: Timothy Redtop	99.65 —	91.01 7.84	90.00 —	94.00 90.00							
SPECIAL SEED MIXTURES												
SECTION 261-C—More than Two Kinds of Agricultural Seed												
507	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Gro-Green Mixture, No. 311 Methe's Checkerboard Store, Springfield					L. — F. 92.76	0.60 0.23	8.35 6.63	0.60 0.38	*/1942 5/1942		
	Ingredients: Kentucky Bluegrass Redtop Colonial Bent White Clover Common Ryegrass Agrostis spp. (Redtop and Colonial Bent)	38.15 18.67 4.90 1.31 2.77 27.72 —	38.83 — — 2.77 24.04 27.12 —	85.00 90.00 90.00 70.00(o) 90.00 — —	86.00 — — 51-45† 97.00 89.00 —							
544	BELMONT HARDWARE CO., Springfield, Mass. Shadyawn Mixture					L. — F. 95.15	0.30 0.40	4.00 4.12	— 0.33	2/1942 5/1942		
	Ingredients: (j) Bluegrass Redtop Timothy Chewings Fescue Perennial Ryegrass Kentucky Bluegrass	13.30 14.20 19.80 19.90 28.50 —	— 11.47 17.04 16.40 26.66 23.58(d)	76.00 88.00 83.00 31.00 90.00 —	— 93.00 84.00 24.00 88.00 75.00							
414	JOSEPH BRECK & SONS, Boston, Mass. Boston Park Mixture Charles A. Smith Co., Mills					L. 95.70 F. 94.82	0.44 0.58	3.25 3.91	0.61 0.69	2/1942 6/1942		

415	Ingredients: Kentucky Bluegrass White Clover Meadow Fescue Perennial Ryegrass (v) Agrostis spp. (Redtop and Creeping Bent) (r)	38.25 1.49 5.61 7.17 5.70 44.65	36.36 2.17 7.17 7.27 90.00 41.85	80.00 90.00(o) 98.00 90.00 90.00 87.00	84.00 73-24 98.00 90.00 90.00 87.00						
	Breck's Shady Spot Mixture Charles A. Smith Co., Millis					L. 90.76 F. 87.61	0.24 0.18	7.66 12.03†	1.34 0.18	3/1942 5/1942	
	Ingredients: Kentucky Bluegrass Meadow Fescue Chewings Fescue (v) Agrostis spp. (Redtop and Creeping Bent) (r)	25.12 10.50 33.02 22.12	26.11 14.96 32.92 13.62	75.00 85.00 80.00 90.00	89.00 98.00 96.00 89.00						
383	COMSTOCK, FERRE & CO., Wethersfield, Conn. Superfine Mixture with Clover, No. 329 A. J. Cataldo & Sons, Franklin					L. — F. 95.67	0.25 0.43	3.38 3.82	0.08	3/1942 5/1942	
	Ingredients: Kentucky Bluegrass Redtop White Dutch Clover Chewings Fescue Astoria Bent Agrostis spp. (Redtop and Colonial Bent)	50.05 28.79 3.91 9.27 4.35 —	56.89 — 2.90 7.67 — 28.21	83.00 90.00 75.00(o) 89.00 90.00 —	72.00† — 59-39 78.00† — 90.00						
1108	EASTERN SEED CO., New York, N. Y. Oxford Park Mixed Grass Seed, No. 41 The Great Atlantic & Pacific Tea Co., Mansfield					L. — F. 90.39	0.40 0.49	11.32 8.91	0.77 0.21	5/1942 6/1942	
	Ingredients: Redtop Timothy Domestic Ryegrass	20.02 46.70 20.79	23.45 47.46 19.48	90.00 90.00 90.00	91.00 72.00† 94.00						

* Information required by law not given.
† Indicates purity below germination below, excessive weed seed, percentage of ingredient found deficient after adding proper tolerance, or excessive inert material, depending upon column in which it is found.
(d) Ingredient declared but found excessive after adding proper tolerance to amount specified.
(j) Term not specific.
(k) Wholesaler claims careless handling by retailer accounts for this mixture.
(o) Hard Seed and Germination of Clover added together in Guarantee.
(r) Creeping Bent found but not declared.
v) Percentage of each ingredient should be stated separately.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when Other than Wholesale Distributor, and Place Collected	Ingredients, %		Germination, %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Notes	Noxious Weed Seeds per Ounce
		Label	Found	Label	Found							
SPECIAL SEED MIXTURES—Continued												
1115	EDGEWOOD FARMS, Ridgefield, N. J. Thriftree Green Grass Seed, No. 877 F. W. Woolworth Co., Waltham					L. F.	0.45 0.67	9.17 8.45	— 0.15	2/1942 6/1942		
	Ingredients: Kentucky Bluegrass Redtop White Dutch Clover Domestic Ryegrass	19.86 31.73 1.92 36.87	21.77 31.74 1.94 35.28	75.00 85.00 65-15 92.00	70.00 92.00 71-26 94.00							
1128	Velvuturf Sunny Blend Lawn Seed, No. J 136 The Garden Toolhouse, Wellesley					L. F.	0.25 0.32	6.25 6.25	— 0.44	4/1942 6/1942		
	Ingredients: Kentucky Bluegrass Redtop, Fancy White Dutch Clover Domestic Ryegrass	41.58 27.10 2.00 22.79	39.42 26.84 1.64 25.09	80.00 90.00 70-20 90.00	79.00 90.00 70-26 98.00							
432	THOMAS W. EMERSON CO., Beverly, Mass. Lawn Mixture F. A. Gould, Milford					L. F.	0.35 0.11	3.91 3.16	— 0.08	1/1942 5/1942		
	Ingredients: Kentucky Bluegrass Redtop White Clover Domestic Ryegrass	13.10 40.00 2.90 39.20	4.82† 64.84(d) 1.00 25.69†	80.00 90.00 94.00(c) 94.00	78.00 92.00 72-27 94.00							
520	Enseco Lawn Mixture Waite Hardware Co., Webster					L. F.	1.00 1.52	8.00 0.06	— 0.06	*1942 5/1942		
	Ingredients: Kentucky Bluegrass Redtop Timothy White Clover Domestic Ryegrass	5.00 5.00 50.00 1.00 30.00	5.27 4.45 54.18 1.27 33.19	75.00 85.00 89.00 94.00(c) 97.00	74.00 93.00 89.00 73-26 97.00							
556	FOSTER FARRAR CO., Northampton, Mass. Special Mixture Lawn Grass Seed					L. F.	0.30 0.17	1.39 1.39	— 0.18	2/1942 5/1942		
	Ingredients: Kentucky Bluegrass Redtop, Fancy Chewings Fescue (e) Colonial Bent (f) Seaside Bent	25.48 41.47 23.52 7.84 —	26.50 40.82 21.74 9.00 —	85.00 90.00 90.00 90.00 —	80.00 84.00 90.00 90.00 —							

718 GARFIELD WILLIAMSON, INC., New York, N. Y.
N. Y. Suburban Grass Mixture, No. 142-2
Metropolitan Hardware & Paint Co., Roxbury

Ingredients: Kentucky Bluegrass.....	9.04	80.00	—	80.43	—	1.00	15.77	—	2/1942
Redtop, Fancy.....	12.40	91.00	—	—	—	0.76	18.59	0.22	6/1942
Timothy.....	27.74	75.00	63.00†	—	—	—	—	—	—
White Clover.....	2.50	78.00(c)	62-36†	—	—	—	—	—	—
Domestic Ryegrass.....	18.13	94.00	90.00	—	—	—	—	—	—
Unhulled Redtop.....	13.80	78.00	—	—	—	—	—	—	—
Redtop.....	24.06	—	83.00	—	—	—	—	—	—

460 THOMAS J. GREY CO., Boston, Mass.

Grass Mixture.....	—	—	—	93.79	—	0.75	8.84	—	1/1942
Ingredients: Kentucky Bluegrass.....	25.00	26.09	80.00	82.00	—	0.46	5.44	0.31	5/1942
Redtop.....	40.00	—	92.00	—	—	—	—	—	—
White Dutch Clover.....	1.96	2.30	92.00(c)	65-32	—	—	—	—	—
(†) Bent.....	4.90	—	90.00	—	—	—	—	—	—
Domestic Ryegrass.....	18.55	17.71	92.00	97.00	—	—	—	—	—
Agrostis spp.....	—	47.09	—	88.00	—	—	—	—	—
(Redtop and Colonial Bent)	—	—	—	—	—	—	—	—	—

186 JOSEPH HARRIS CO., INC., Rochester, N. Y.

Harris Superfine Lawn Mixture, No. 2252 Joseph Harris Co., Inc., Cambridge	—	—	—	97.98	—	0.40	1.80	Trace	1/1942
Ingredients: Kentucky Bluegrass.....	53.90	51.36	90.00	87.00	—	0.24	1.78	—	4/1942
Redtop.....	39.00	41.67	94.00	94.00	—	—	—	—	—
White Clover.....	4.90	4.95	96.00	92-5	—	—	—	—	—

1114 S. S. KRESGE CO., Detroit, Mich.
Better Homes Grass Seed, No. J 233
S. S. Kresge Co., Waltham

Ingredients: Kentucky Bluegrass.....	20.00	23.78	75.00	76.00	—	0.50	9.98	—	5/1942
Redtop.....	32.86	35.08	85.00	90.00	—	0.33	3.93	0.25	5/1942
White Dutch Clover.....	1.96	2.18	85.00	79-19	—	—	—	—	—
Domestic Ryegrass.....	34.70	34.45	90.00	95.00	—	—	—	—	—

* Information required by law not given.

† Indicates purity below germination below, excessive weed seed, percentage of ingredient found deficient after adding proper tolerance, or excessive inert material, depending upon column in which it is found.

(d) Ingredient declared but found excessive after adding proper tolerance to amount specified.

(e) Ingredient declared but not found.

(f) Ingredient found but not declared.

(g) Term not specific.

(h) Hard Seed and Germination of Clover added together in Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when Other than Wholesale Distributor, and Place Collected	Ingredients, %		Germination, %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Notes	Noxious Weed Seeds per Ounce
		Label	Found	Label	Found							
SPECIAL SEED MIXTURES—Continued												
560	D. LANDRETH SEED CO., Bristol, Pa. Superior Bent Lawn Seed, No. 1-D-1 Frank L. Whircomb, Amherst					L. — F. 89.58	0.33 0.29	10.54 9.94	0.07 0.19	12/1941 5/1942		
		Ingredients: Kentucky Bluegrass Redtop, Fancy Sea-Isle Bent Agrostis spp. (Redtop and Creeping Bent)	51.45 27.97 9.64 —	51.65 — — 37.93	81.00 90.00 84.00 —	82.00 — — 87.00						
1131	JOHN D. LYON, INC., Belmont, Mass. Special Shady Lawn Grass Seed, No. 14271 F. Diehl & Sons, Wellesley					L. — F. 93.48	0.25 0.25	3.70 6.10	— 0.17	1/1942 6/1942	(c)	
		Ingredients: Kentucky Bluegrass Redtop, Fancy Chewing's Fescue Domestic Ryegrass Poa Trivialis	13.20 39.20 9.90 24.75 9.00	15.33 38.91 8.82 24.98 5.44†	80.00 90.00 90.00 90.00 80.00	87.00 90.00 35.00† 96.00 56.00†						
1105	MASSACHUSETTS HARDWARE DISTRIBUTORS, INC., Boston, Mass. Standard Park Mixed Lawn Seed, No. G 29 Metro Paint & Supply Co., Inc., Brockton					L. — F. 89.66	1.25 0.49	14.80 9.78	— 0.07	2/1942 6/1942		
		Ingredients: Kentucky Bluegrass Redtop Timothy Common Ryegrass	10.40 8.85 35.00 29.70	11.89 10.49 37.79 29.49	70.00 85.00 60.00 85.00	81.00 88.00 56.00 91.00						
1047	MICHAEL-LEONARD SEED CO., Chicago, Ill. Quick Grow Grass Seed The Smith Hardware Co., Lowell					L. — F. 93.66	1.00 0.37	12.87 5.90	— 0.07	1/1942 6/1942		
		Ingredients: Kentucky Bluegrass Redtop Timothy Domestic Ryegrass	20.92 21.12 9.90 34.19	23.38 27.11(d) 5.38† 37.79	80.00 90.00 94.00 92.00	79.00 94.00 88.00 92.00						

	L.		F.		*/1942	(a) 33 English Plantain
	97.00	96.23	0.35	2.65		
461	MIDDLESEX COUNTY FARM BUREAU ASSOC., Waltham, Mass.					
	Hayland Mixture for Medium to Heavy Soils.....					
	Middlesex County Farm Bureau Assoc., Worcester.....					
	18.40	19.09	90.00	92.00	1.00	5/1942
	44.98	43.58	90.00	89.00	0.32	2.45
	33.00	33.56	90-10	78-19†		
	Ingredients: Redtop.....					
	Timothy.....					
	Alsike Clover.....					
724	NEW YORK SEED SERVICE, INC., Jersey City, N. J.					
	Island Green Mixed Grass Seed, No. L-451-X.....					
	Diamond Hardware Stores, Inc., Mattapan.....					
	2.47	6.60(d)	70.00	77.00	3.84	1/1942
	1.54	1.33	75.00	85.00	0.07	6/1942
	10.03	8.84	83.00	88.00		
	48.94	51.82	73.00	77.00		
	17.80	16.41	87.00	91.00		
	Ingredients: Kentucky Bluegrass.....					
	Canada Bluegrass.....					
	Redtop.....					
	Timothy.....					
	Common Ryegrass.....					
926	PAGE SEED CO., Greene, N. Y.					
	Page's Marvelawn, No. L 14,742.....					
	Snyder's Store, Hoosatonc.....					
	19.11	21.73	83.00	84.00	0.70	1/1942
	29.40	27.53	94.00	95.00	0.61	6/1942
	10.70	11.07	88.00	88.00		
	5.75	5.52	59-39	47-47†		
	8.65	9.51	96.00	92.00		
	14.60	15.86	98.00	96.00		
	6.04	3.71†	68.00	62.00		
	Ingredients: Kentucky Bluegrass.....					
	Redtop.....					
	Timothy.....					
	White Clover.....					
	Meadow Fescue.....					
	Perennial Ryegrass.....					
	Rough Bluegrass.....					
583	I. L. RADWANER SEED CO., INC., New York, N. Y.					
	Parklawn Code 2 No. 2 Y-Peeking Order No. 87.....					
	Standard Hardware Co., Inc., Lynn.....					
	10.00	11.13	80.00	81.00	3.05	3/1942
	50.45	55.59	80.00	31.00†	0.30	6/1942
	19.60	—	80.00	—		
	—	19.04	—	93.00		
	Ingredients: Redtop.....					
	Timothy.....					
	(e) Italian Ryegrass.....					
	(f) Domestic Ryegrass.....					

* Information required by law not given.

† Indicates purity below, germination below, excessive weed seed, percentage of ingredient found deficient after adding proper tolerance, or excessive inert material, depending upon column in which it is found.

- (a) Noxious Weeds not declared but found excessive.
- (b) Wholesaler claims seed not sold by him, at least not during current year.
- (c) Ingredient declared but found excessive after adding proper tolerance to amount specified.
- (d) Ingredient declared but not found.
- (e) Ingredient declared but not found.
- (f) Ingredient found but not declared.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when Other than Wholesale Distributor, and Place Collected	Ingredients, %		Germination, %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Notes	Noxious Weed Seeds per Ounce
		Label	Found	Label	Found							
SPECIAL SEED MIXTURES—Continued												
584	L. RADWANER CO., INC.—Continued Park Central Prime, Code 2 Y. Standard Hardware Co., Inc., Lynn					L. 89.27 F. —	0.90 0.44	14.00 9.92	3.05 0.37	3/1942 6/1942		
	Ingredient: Redtop.....	12.00	13.22	80.00	79.00							
	Timothy.....	50.45	62.75	80.00	35.00†							
	(e)Italian Ryegrass.....	19.60	—	80.00	—							
	(f)Domestic Ryegrass.....	—	13.30	—	93.00							
585	Competition Park Central, Code 22—Packing Order No. 87. Standard Hardware Co., Inc., Lynn					L. — F. 85.75	0.90 0.35	15.00 13.42	3.05 0.48	3/1942 6/1942		
	Ingredient: Redtop.....	11.00	12.54	80.00	82.00							
	Timothy.....	50.45	50.51	80.00	35.00†							
	(e)Italian Ryegrass.....	19.60	—	80.00	—							
	(f)Domestic Ryegrass.....	—	22.70	—	90.00							
738	Tuxor Grass "A Special Seed Mixture," Code 2 U. Gofkamf's Stores, Inc., Roslindale					L. — F. 74.33	0.90 3.51†	12.00 20.90†	3.05 1.26	1/1942 6/1942	(a) 72 English Plantain	
	Ingredient: Redtop.....	14.00	19.98(d)	80.00	61.00†							
	Timothy.....	50.45	21.15†	80.00	84.00							
	(e)Italian Ryegrass.....	19.60	—	80.00	—							
	(f)Domestic Ryegrass.....	—	33.20	—	97.00							
1099	Park Central Prime Mixed Grass Seed—Code 27. Jack & Harry's Auto Stores, Brockton					L. — F. 84.33	0.90 0.08	14.00 14.56	3.05 1.03	3/1942 6/1942		
	Ingredient: Redtop.....	12.00	4.93†	80.00	73.00							
	Timothy.....	50.45	48.61	80.00	17.00†							
	Italian Ryegrass.....	19.60	30.79(d)	80.00	67.00†							
719	RIDGEFIELD SEED CO., Ridgefield, N. J. Yankee Grass Seed Mixture, No. 18-2. Metropolitan Hardware & Paint Co., Roxbury					L. — F. 78.08	1.50 1.05	19.09 19.54	1.50 1.33	2/1942 5/1942	(a) 7 English Plantain, 3 Brassica spp., 1 Canada Thistle, and 1 Quack Grass	

1021	INGREDIENTS: Kentucky Bluegrass.....		2.46	3.30	80.00	68.00†					
	Redtop.....		6.15	6.11	78.00	91.00					
	Timothy.....		61.50	56.50	75.00	79.00					
	Domestic Ryegrass.....		9.80	12.17	90.00	95.00					
ROSS BROS. CO., Worcester, Mass.											
1021	Truogreen Lawn Seed.....					91.71	7.80	0.33	—	2/1942	
	City Grain Co., Marlboro					95.32	4.22	0.27	0.19	6/1942	
354	INGREDIENTS: Kentucky Bluegrass.....		39.65	52.53(d)	86.00	70.00†					
	Redtop.....		32.76	23.76†	92.00	94.00					
	Timothy.....		0.91	1.13	95.00	84.00†					
	Domestic Ryegrass.....		18.39	17.90	95.00	92.00					
WM. G. SCARLETT & CO., Baltimore, Md.											
354	Maple Permanent Pasture Mixture, No. 22021.....					94.02	10.00	1.00	—	1/1942	
	C. P. Washburn Co., Middleboro.....						5.36	0.58	0.04	5/1942	(a) 30 English Plantain, 4 Dodder, and 1 Brassica sp.
359	INGREDIENTS: Kentucky Bluegrass.....		9.00	8.78	70.00	79.00					
	Redtop.....		8.50	9.64	85.00	89.00					
	Sweet Clover.....		7.50	14.67(d)	75.00(c)	46-14†					
	Timothy.....		24.00	25.13	85.00	88.00					
359	Greenway Lawn Seed Mixture, No. 23586.....										
	C. P. Washburn Co., Middleboro.....					89.51	9.70	0.50	0.10	2/1942	
	INGREDIENTS: Kentucky Bluegrass.....		40.50	40.57	75.00	85.00					
	Redtop.....		28.00	—	90.00	—					
	White Clover.....		1.90	2.21	—	65-15					
	Chewings Fescue.....		4.85	5.48	80.00	73.00					
359	(g) Bent.....		—	—	85.00	—					
	(i) Ryegrass.....		9.80	—	90.00	—					
	Domestic Ryegrass.....		—	9.52	—	86.00					
	Agrostis spp.....		—	31.73	—	89.00					
(Redtop and Creeping Bent)											

† Indicates purity below, germination below, excessive weed seed, percentage of ingredient found deficient after adding proper tolerance, or excessive inert material, depending upon column in which it is found.
 (a) Noxious Weeds not declared but found excessive.
 (b) Ingredient declared but found excessive after adding proper tolerance to amount specified.
 (c) Ingredient declared but not found.
 (d) Ingredient found but not declared.
 (e) Term not specific.
 (f) Term not specific.
 (g) Hard Seed and Germination of Clover added together in Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS -- Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when Other than Wholesale Distributor, and Place Collected	Ingredients, %		Germination, %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Notes	Noxious Weed Seeds per Ounce
		Label	Found	Label	Found							
SPECIAL SEED MIXTURES--Continued												
509	SEARS, ROEBUCK & CO., Springfield, Mass. Robin Hood Shady Lawn Seed Mixture, No. 289 45					L. — F. 90.65	0.50 0.64	6.65 8.49†	1.00 0.22	1/1942 5/1942		
	Ingredients: Kentucky Bluegrass	29.75	25.70	80.00	76.00							
	Redtop	18.00	—	90.00	—							
	Chewings Fescue	24.50	13.56†	80.00	86.00							
	Domestic Ryegrass	14.70	23.27(d)	90.00	93.00							
	(e) Meadow Fescue	4.90	—	90.00	—							
	Agrostis spp.	—	28.12	—	93.00							
	(Redtop and Colonial Bent) (w)											
510	Park Lawn Seed Mixture					L. — F. 89.05	0.50 0.53	7.98 10.07†	1.00 0.35	1/1942 5/1942		
	Ingredients: Kentucky Bluegrass	34.00	34.95	80.00	66.00†							
	Redtop	25.20	21.80	90.00	96.00							
	White Clover	1.92	1.92	85.00(o)	70-26							
	Domestic Ryegrass	29.40	30.38	90.00	94.00							
1129	O. M. SCOTT & SONS, Marysville, Ohio Scott's Lawn Seed for Sunny Lawns, No. 0889 The Garden Tool House, Wellesley					L. — F. 98.77	0.09 0.05	2.79 1.18	— —	2/1942 6/1942		
	Ingredients: Kentucky Bluegrass	65.40	64.01	85.00	80.00							
	Redtop, Fancy	24.37	—	90.00	—							
	Colonial Bent Grass	7.35	—	85.00	—							
	Agrostis spp.	—	34.76	—	87.00							
	(Redtop and Colonial Bent)											
615	WHITNEY SEED CO., INC., Buffalo, N. Y. Tut's College Special Mixture Clarendon Hill Hardware Co., Somerville					L. — F. 93.34	2.92 0.23	7.69 5.96	— 0.47	*/* 6/1942	(a) 7 English Plantain	
	Ingredients: Kentucky Bluegrass	29.75	28.58	85.00	86.00							
	Redtop	27.90	17.97	90.00	79.00							
	Chewings Fescue	14.90	17.97	85.00	79.00							
	White Clover	—	2.63	—	91-4							

	Colonial Bent.....	4.90	—	90.00	—						
	Domestic Ryegrass.....	11.88	10.15	92.00	90.00						
	Agrostis spp. (Redtop and Colonial Bent)	—	34.01	—	93.00						
747	F. H. WOODRUFF & SONS, Milford, Conn. Velvet Lawn Mixture, G. S. 1313 AMS No. 1. Little Tree Farms, Framingham Center					L.	96.90	0.25	2.30	—	2/1942
	Ingredients: Kentucky Bluegrass.....	49.00	48.60	85.00	88.00	F.	—	0.15	2.80	0.15	6/1942
	Redtop, Fancy.....	14.45	—	90.00	—						
	Certified Colonial Bent.....	14.50	—	85.00	—						
	Certified Perennial Ryegrass.....	19.50	17.88	90.00	95.00						
	Agrostis spp. (Redtop and Colonial Bent)	—	30.42	—	89.00						
287	S. D. WOODRUFF & SONS, Orange, Conn. Velvet Lawn Mixture.....					L.	—	1.00	8.00	—	1/1942
	Van Duzer Hardware Co., Framingham					F.	93.03	0.40	6.57	—	4/1942
	Ingredients: Kentucky Bluegrass.....	22.00	22.70	*	80.00						
	Redtop, Fancy.....	25.00	25.71	*	94.00						
	Timothy.....	20.00	21.13	*	90.00						
	Domestic Ryegrass.....	24.00	23.49	*	93.00						
839	Central Lawn Seed.....					L.	—	1.00	6.00	—	1/1942
	Adams Hardware & Paint Co., Lowell					F.	94.19	0.65	5.10	0.06	6/1942
	Ingredients: Kentucky Bluegrass.....	12.00	13.02	*	80.00						
	Redtop.....	(z)	24.83	*	94.00						
	Timothy.....	25.00	27.83	*	92.00						
	Domestic Ryegrass.....	29.00	28.51	*	88.00						
626	UNKNOWN Green Lawn Grass Seed G. S. 737.....					L.	—	1.50	14.50	—	2/1942
	Teddy's Wall Paper & Paint Shop, Jamaica Plain					F.	90.69	0.32	8.44	0.55	5/1942
	Ingredients: Kentucky Bluegrass.....	1.50	1.89	60.00	74.00						
	Redtop.....	5.00	9.78(d)	70.00	86.00						
	Timothy.....	48.00	50.16	70.00	68.00						
	Common Ryegrass.....	29.50	28.86	90.00	95.00						

* Information required by law not given.
 † Indicates purity below, germination below, excessive weed seed, percentage of ingredient found deficient after adding proper tolerance, or excessive inert material, depending upon column in which it is found.
 (a) Noxious Weeds not declared but found excessive.
 (d) Ingredient declared but found excessive after adding proper tolerance to amount specified.
 (e) Ingredient declared but not found.
 (c) Hard Seed and Germination of Clover added together in Guarantee.
 (w) Colonial Bent found but not declared.
 (z) Redtop declared but figures not legible on tag.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS — Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when Other than Wholesale Distributor, and Place Collected	Ingredients, %		Germination, %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Notes	Noxious Weed Seeds per Ounce
		Label	Found	Label	Found							
SPECIAL SEED MIXTURES—Concluded												
722	UNKNOWN Boston Lawn Seed Mixture.....					—	1.25	14.80	—	2/1942	940 English Plantain per lb.	
	Diamond Hardware Stores, Inc., Mattapan					F. 85.20	0.91	13.82	0.07	5/1942	6 English Plantain per oz.	
	Ingredients: Kentucky Bluegrass.....	10.40	11.32	70.00	80.00							
	Redtop.....	8.85	9.46	85.00	86.00							
	Timothy.....	35.00	35.29	60.00	56.00							
	Common Ryegrass.....	29.70	29.13	85.00	89.00							
841	Riverside Park Lawn Grass Seed G. S. 737.....					L. —	1.50	14.50	—	3/1942	8900 English Plantain per lb.	
	Atlantic Distributing Co., Lowell					F. 85.21	0.20	12.60	1.99	5/1942	15 English Plantain per oz.	
	Ingredients: Kentucky Bluegrass.....	1.50	2.29	60.00	67.00							
	Redtop.....	5.00	4.62	70.00	86.00							
	Timothy.....	48.00	51.99	70.00	80.00							
	Common Ryegrass.....	29.50	26.31	90.00	94.00							

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Germination Date	Germination Found %	Month of Test 1942
ARTICHOKE					
Standard Germination 60%					
205	JOSEPH SORDILLO & SONS, Boston, Mass. Cardone, Italiano	-	—	42†	May
ASPARAGUS					
Standard Germination 70%					
330	COMSTOCK, FERRE & CO., Wethersfield, Conn. Mary Washington Foster Farrar Co., Northampton	90	12/1941	84-6	April
332	CHARLES C. HART SEED CO., Wethersfield, Conn. Mary Washington Federal Supply Co., Northampton	-	—	24†	April
BEANS					
Standard Germinations: Beans (Except Limas) 80% Beans (Limas) 70%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
782	Asgrow Stringless Green Pod Thornton & Crouch, Lawrence	85	10/1941	90	June
786	French Horticultural Kingston Hardware Co., Kingston	77	1/1942	69‡	June
1123	London Horticultural Pole R. P. Swan, Stoughton	78	10/1941	40‡	June
W. E. AUBUCHON CO., INC., Fitchburg, Mass.					
475	Golden Wax W. E. Aubuchon Co., Inc., Amherst	-	—	73†	April
1008	Dwarf Horticultural W. E. Aubuchon Co., Inc., Shelburne Falls	-	—	96	June
1133	Pole Horticultural W. E. Aubuchon Co., Inc., Leominster	-	—	96	June
JOSEPH BRECK & SONS, Boston, Mass.					
23	Bountiful, No. C 109	-	—	95	April
37	Tewksbury Dwarf Horticultural, No. C 106	-	—	68†	April
673	Dwarf Horticultural Church & Stowell Co., Wareham	-	—	91	June
757	Kentucky Wonder Wax Town Paint & Supply Co., Natick	-	—	74†	June
801	Horticultural Pole John E. Jordan Co., Plymouth	-	—	76†	June
806	Stringless Green Pod L. B. Willis, East Bridgewater	-	—	94	June
W. ATLEE BURPEE CO., Philadelphia, Pa.					
228	Rustproof Golden Wax Franklin Hardware Co., No. Attleboro	85	2/1942	81-1	April
846	French Horticultural Pole C. B. Coburn Co., Lowell	-	—	94	June

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
BEANS—Continued					
761-a	CARMEL GIFT MAKERS, Carmel, Cal. Bountiful Early Bush..... R. H. White Co., Boston	-	—	23†	June
416	COMSTOCK, FERRE & CO., Wethersfield, Conn. Pencil Pod Black Wax..... Adams & Co., Holliston	-	—	96	April
611	Dwarf Horticultural..... R. W. Shattuck Co., Inc., Arlington	-	—	95	June
767	Bountiful 6 Weeks..... H. Bruckman, Lawrence	-	—	93	June
196	THOMAS W. EMERSON CO., Beverly, Mass. French Dwarf Horticultural..... Middlesex County Farm Bureau Assoc., Waltham	-	—	97	April
381	Pencil Pod Black Wax..... A. J. Cataldo & Sons, Franklin	-	—	75†	May
652	Golden Wax..... Bellingham Hardware Co., Weymouth	-	—	91	June
754	Mammoth Horticultural Pole..... Goodman Hardware Co., Framingham	-	—	93	June
500	FERRY-MORSE SEED CO., Detroit, Mich. Pencil Pod Black Wax..... Carlisle Hardware Co., Springfield	-	—	86	May
503	Golden Wax..... Carlisle Hardware Co., Springfield	-	—	74†(c)	May
8	THOMAS J. GREY CO., Boston, Mass. Bountiful.....	-	—	83	April
511	CHARLES C. HART SEED CO., Wethersfield, Conn. Dwarf Horticultural or Cranberry..... Waite Hardware Co., Southbridge	-	—	94	May
517	Brittle Wax..... Waite Hardware Co., Southbridge	-	—	90	May
518	Golden Wax..... Waite Hardware Co., Southbridge	-	—	76-2†	May
532	Golden Wax..... Mendelsolin's, Waltham	-	—	88-7	May
879	Kentucky Wonder..... Carr Hardware Co., Pittsfield	-	—	93	June
541	D. LANDRETH SEED CO., Bristol, Pa. Horticultural Pole..... Belmont Hardware Co., Springfield	88	—	97	May
819	French Horticultural..... Parkers Farm Supply Co., Danvers	88	1/1942	81	June
904	MICHAEL-LEONARD SEED CO., Chicago, Ill. Pencil Pod Black Wax, No. 3612..... Peirson Hardware Co., Pittsfield	85+	12/1941	87	June
924	THE PAGE SEED CO., Greene, N. Y. Burpee's Stringless Green Pod..... Snyder's Store, Hoosatonie	-	—	83	June

† Below Standard.

(c) Wholesaler claims seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
BEANS—Concluded					
60	PERRY SEED CO., Boston, Mass. Bountiful, No. 361	-	—	82	April
571	ROSS BROS. CO., Worcester, Mass. Golden Wax	96	1/1942	91	June
	A. S. Tucker, Hardware, Warren				
529	F. H. WOODRUFF & SONS, Milford, Conn. Pencil Pod Black Wax, No. 21536	-	—	91	May
	Winers Hardware Co., Inc., Whitman				
751	French Horticultural, No. 121258	Approx. 77	11/1941	79	June
	Boston Supply Co., Inc., Framingham				
752	London Horticultural Cranberry Pole, No. 1-9115	-	—	92	June
808	French Horticultural, No. 1-21258	77	12/1941	78	June
	Danvers Hardware Co., Danvers				
843	French Horticultural	-	—	73†	June
	Middlesex Supply Co., Lowell				
533	S. D. WOODRUFF & SONS, Orange, Conn. Burpee's Stringless, No. 2594	80	1/1942	82	May
	Swartz Hardware Co., Newton				
736	Striped Creaseback	87	12/1941	93	June
	New Style Hardware Co., Roslindale				
812	Stringless Green Pod	-	1938	58†(c)	June
	Danvers Hardware Co., Danvers				
838	French Horticultural	-	—	39†(c)	June
	Adams Hardware & Paint Co., Lowell				
756	UNKNOWN Horticultural Pole	-	—	69†	June
	The Fiske Corporation, Natick				
870	Longfellow Yellow 6 Weeks	90	—	88	June
	John S. Glennon, Hardware, Dalton				
873	Improved Golden Wax	90	—	91	June
	John S. Glennon, Hardware, Dalton				
BEETS					
Standard Germination 65%					
170F	ASSOCIATED SEED GROWERS, INC., New Haven, Conn. Detroit Dark Red	81	12/1941	82	May
	W. G. Pearse & Co., Fall River				
361F	Crosby's Egyptian	79	1/1942	85	April
	Shurtleff Hardware Co., Middleboro				
21F	JOSEPH BRECK & SONS, Boston, Mass. Edmund's Blood Turnip, No. C 120	-	—	70	April
86F	Crosby's Egyptian, No. C 317	65	—	76	May
102F	W. ATLEE BURPEE CO., Philadelphia, Pa. Detroit Dark Red	-	—	78	April
	L. Richmond & Co., Brockton				
229F	Detroit Dark Red, No. 4025	91	12/1941	91	April
	Franklin Hardware Co., No. Attleboro				

† Below Standard.

(c) Wholesaler claims seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
BEETS—Continued					
230F	W. ATLEE BURPEE CO—Continued Boston Crosby or Early Wonder, No. 4025 Franklin Hardware Co., No. Attleboro	70	12/1941	90	April
306F	Crosby's Egyptian S. Allen's Sons, Greenfield	—	—	74	April
761-b	CARMEL GIFT MAKERS, Carmel, Cal. Crosby's Egyptian Early Sweet R. H. White Co., Boston	—	—	90	June
43F	COMSTOCK, FERRE & CO., Wethersfield, Conn. Detroit Dark Red A. E. Wordell, New Bedford	—	—	87	May
111F	Edmund's Early Blood Frank P. Mills, Campello	—	—	76	April
174F	Early Wonder J. W. Gardiner & Sons, Fall River	—	—	73	May
106F	CROSMAN SEED CORPORATION, East Rochester, N. Y. Crosby's Early Egyptian S. S. Kresge Co., Brockton	65	—	71	May
762-b	Detroit Dark Red S. S. Kresge Co., Boston	60	—	84	June
63F	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Crosby (Early Wonder), No. 312 Eastern States Farmers' Exchange, Waltham	90	1/1942	94	May
151F	Detroit, No. 612 Eastern States Farmers' Exchange, Brockton	75	1/1941	83	May
207F	THOMAS W. EMERSON CO., Beverly, Mass. Early Wonder, No. 68 B	81	12/1941	86	April
224F	Early Wonder Tall Top	—	—	59†	May
317F	Detroit Dark Red Clark Hardware Co., Greenfield	—	—	82	April
382F	Extra Early Dark Egyptian A. J. Cataldo & Sons, Franklin	—	—	47†	April
348F	EMPIRE SEED CO., Fredonia, N. Y. Early Blood Turnip Woodlawn Supply Co., So. Hadley	—	—	71	April
273F	FERRY-MORSE SEED CO., Detroit, Mich. Detroit Dark Red, No. 66223 Copeland Hardware Co., Taunton	—	—	93	April
40F	FREDONIA SEED CO., Fredonia, N. Y. Detroit Dark Red J. H. Ogden & Co., New Bedford	—	—	87	April
653F	Early Eclipse Bellingham Hardware Co., Weymouth	—	—	85	May
1F	THOMAS J. GREY CO., Boston, Mass. Crosby's Egyptian	—	—	71	April
176F	JOSEPH HARRIS CO., INC., Rochester, N. Y. Crosby's Egyptian, No. 446 Joseph Harris Co., Inc., Cambridge	84	—	80	May

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
BEETS—Continued					
CHARLES C. HART SEED CO., Wethersfield, Conn.					
114F	Detroit Dark Red Pierce Hardware Co., Taunton	75	1/1942	53‡	April
115F	Early Wonder Pierce Hardware Co., Taunton	80	12/1941	91	April
285F	Early Wonder Raymond's, Inc., Boston	65	1/1942	93	April
344F	Crosby's Egyptian J. Russell & Co., Holyoke	-	—	67	April
374F	Edmand's Blood Turnip W. K. Gilmore & Sons, Inc., Medfield	84	12/1941	81	May
878	Early Blood Turnip Carr Hardware Co., Pittsfield	72	1/1941	88	June
BUDD D. HAWKINS, Reading, Vt.					
1077	Detroit Dark Red Herman F. Davis, Merrimac	-	—	82	June
HYGRADE SEED CO., INC., Fredonia, N. Y.					
93F	Crosby's Egyptian Franklin School, Holbrook	-	—	78	May
D. LANDRETH SEED CO., Bristol, Pa.					
288F	Egyptian Extra Early, No. 110 Worcester Grain & Coal Co., Worcester	76 or Better	1/1942	85	April
289F	Detroit Dark Red, No. 145 Worcester Grain & Coal Co., Worcester	75 or Better	1/1942	69	April
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
258F	Crosby's Egyptian, No. 28371 Pierce Hardware Co., Taunton	70+	1/1942	75	April
405F	Dark Red Egyptian, No. 28371X W. E. Aubuchon Co., Inc., Milford	75	12/1940	67	April
423F	Leonard's Dark Red Egyptian W. E. Aubuchon Co., Inc., Holliston	-	—	65	April
471F	Dark Red Egyptian, No. 21 W. E. Aubuchon Co., Inc., Amherst	70+	1/1942	72	April
477F	Improved Dark Red Mutual Plumbing & Heating Co., Amherst	-	—	85	April
906	Detroit Dark Red, No. 2522 Peirson Hardware Co., Pittsfield	70+	1/1942	82	June
NORTHRUP, KING & CO., Minneapolis, Minn.					
13F	Extra Early Flat Egyptian F. W. Woolworth Co., Boston	-	Packed for 1942	67	April
THE PAGE SEED CO., Greene, N. Y.					
161F	Early Wonder D 20-4839 Antonio M. Pires, Fall River	Approx. 65	12/1941	73	May
523F	Detroit Dark Red Gatzke Hardware Co., Webster	-	—	89	May
PERRY SEED CO., Boston, Mass.					
81F	Crosby's Improved Egyptian, No. 1143	-	—	78	May
JEROME B. RICE SEED CO., Cambridge, N. Y.					
77F	Crosby's Egyptian Middlesex County Farm Bureau Assoc., Weymouth	70	12/1941	83	May

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
BEETS—Concluded					
129F	J. B. RICE, JR., INC., Shushan, N. Y. Early Blood Turnip John M. Fitzgerald Co., Taunton	Approx. 80	11/1941	79	May
300F	ROSS BROS. CO., Worcester, Mass. Detroit Dark Red, No. 731	-	—	71	May
246F	SARGENT'S GRAIN & SUPPLY CO., Brockton Detroit Dark Red	-	—	79	April
199F	JOSEPH SORDILLO & SONS, Boston Large Blood	-	—	86	April
88F	STERLING SEED CO., Minneapolis, Minn. Early Blood Turnip W. T. Grant Co., Boston	-	—	83	May
127F	F. H. WOODRUFF & SONS, Milford, Conn. Crosby's Egyptian, No. 18384 Waldron Hardware Co., Taunton	77	11/1941	77	May
128F	Woodruff's Early Wonder, No. 2219 Waldron Hardware Co., Taunton	Approx. 65	12/1941	49‡	April
156F	Early Wonder, No. 1-223 Jose D'Aruda, Fall River	Approx. 81	12/1941	82	May
188F	Detroit Dark Red, No. 18395 Middlesex County Farm Bureau Assoc., Waltham	65	12/1941	65	April
189F	Crosby's Egyptian, No. 18354 Middlesex County Farm Bureau Assoc., Waltham	Approx. 74	12/1941	72	April
366F	Detroit Dark Red, No. 13428 Farm Service Store, Middleboro	Approx. 87	12/1941	90	April
465F	Crosby's Egyptian Middlesex County Farm Bureau Assoc., Worcester	-	—	69	May
467F	Early Red Chief, No. 1-318 Middlesex County Farm Bureau Assoc., Worcester	Below Standard 61	12/1941	48‡	May
528F	Crosby's Egyptian, No. 18451 Winers Hardware Stores, Inc., Whitman	-	—	77	May
534F	Detroit Dark Red, No. 17992 Agawam Public Market, Agawam	-	—	81	May
231F	S. D. WOODRUFF & SONS, Orange, Conn. Early Wonder, No. 2168 Monroe's Seed Market, Attleboro	70	12/1941	85	April
232F	Detroit Dark Red, No. 2325 Monroe's Seed Market, Attleboro	70	12/1941	88	April
832F	Crosby's Early Egyptian, No. 2288 Adams Hardware & Paint Co., Lowell	70	12/1941	67	May

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
BROCCOLI					
Standard Germination 75%					
974	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Calabrese Checkerboard Feed Store, Pittsfield	-	—	79	June
768	W. ATLEE BURPEE CO., Philadelphia, Pa. Calabrese H. Bruckman, Lawrence	-	—	55†	May
1055	COMSTOCK, FERRE & CO., Wethersfield, Conn. Italian Green Sprouting F. X. Robichaud, Methuen	-	—	93	June
578	CROSMAN SEED CORPORATION, East Rochester, N. Y. Italian Green Calabrese S. S. Kresge Co., Quincy	-	—	80	May
64	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Calabrese, No. 612 Eastern States Farmers' Exchange, Waltham	90	12/1941	98	April
935	EMPIRE SEED CO., Fredonia, N. Y. Italian Green Sprouts Ely's Market, Great Barrington	-	—	77	May
774	D. LANDRETH SEED CO., Bristol, Pa. Calabrese Essex Hardware & Plumbing Supply Co., Lawrence	-	—	80	May
204	JOSEPH SORDILLO & SONS, Boston, Mass. Calabrese	-	—	93	April
BRUSSELS SPROUTS					
Standard Germination 70%					
828	COMSTOCK, FERRE & CO., Wethersfield, Conn. Improved Long Island Essex County Cooperative Farming Association, Topsfield	-	—	71	May
666	CHARLES C. HART SEED CO., Wethersfield, Conn. Improved Long Island Buzzard's Bay Hardware Co., Buzzard's Bay	Below Standard 50	1/1942	50	May
743	LITTLE TREE FARMS, Framingham Center, Mass. Long Island Improved	-	—	37†	May
135	J. B. RICE, JR., Shushan, N. Y. Long Island John M. Fitzgerald Co., Taunton	Approx. 40	11/1941	29‡	May
1062	F. H. WOODRUFF & SONS, Milford, Conn. Improved Long Island Haverhill Hardware & Plumbing Supply Co., Haverhill	-	—	63†(c)	June

† Below Standard.

‡ Below Standard and below Guarantee.

(c) Wholesaler claims seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
CABBAGE					
Standard Germination 75%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
483	Danish Ballhead Checkerboard Feed Store, Amherst	-	—	78	May
W. E. BARRETT CO., Providence, R. I.					
276	Improved American Savoy Copeland Hardware Co., Taunton	-	—	67†	May
W. ATLEE BURPEE CO., Philadelphia, Pa.					
398	Savoy (Perfection Drumhead) Win. H. Casey Store, Milford	Approx. 80	1/1942	81	April
731	Charleston Wakefield The Fair, Roslindale	-	—	92	May
JOSEPH BRECK & SONS, Boston, Mass.					
33	Danish Ballhead Tall Stem, No. C 144	-	—	92	April
771	Savoy Essex Hardware & Plumbing Supply Co., Lawrence	-	—	55†	May
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
101	Danish Ballhead L. Richmond & Co., Brockton	-	—	81	April
225	Copenhagen Market Franklin Hardware Co., No. Attleboro	81	12/1941	73‡	May
1116	Drumhead Savoy Bell Hardware Co., Stoneham	-	—	75	June
CROSMAN SEED CORPORATION, East Rochester, N. Y.					
576	Crosman's Premium Late Flat Dark S. S. Kresge Co., Quincy	80	1942	86	May
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
65	Penn. State Ballhead, No. 1101 Eastern States Farmers' Exchange, Waltham	80	12/1941	88	April
THOMAS W. EMERSON CO., Beverly, Mass.					
214	Golden Acre, No. 1	-	—	86	April
380	Danish Ballhead A. J. Cataldo & Sons, Franklin	-	—	29†	May
430	Winningsstadt F. A. Gould, Milford	-	—	21†	April
EMPIRE SEED CO., Fredonia, N. Y.					
536	Savoy D. F. Mazzaferro, Springfield	Below Standard 40	12/1941	48	April
THOMAS J. GREY CO., Boston, Mass.					
12	Golden Acre	-	—	81	April
CHARLES C. HART SEED CO., Wethersfield, Conn.					
335	Copenhagen Federal Supply Co., Northampton	-	—	77	April
336	Early Jersey Wakefield Federal Supply Co., Northampton	-	—	11†	April

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
CABBAGE—Continued					
CHARLES C. HART SEED CO.—Continued					
877	Danish Ballhead. Carr Hardware Co., Pittsfield	-	-	65†	May
995	Premier Late Flat Dutch. Burlingame & Darbys Co., No. Adams	-	-	32†	June
BUDD D. HAWKINS, Reading, Vt.					
1081	True Early Winningsstad. Herman F. Davis, Merrimac	-	--	75	June
1082	Copenhagen Market. Herman F. Davis, Merrimac	-	--	4†	June
HYGRADE SEED CO., Fredonia, N. Y.					
97	Copenhagen Market Franklin School, Holbrook	-	--	92	April
D. LANDRETH SEED CO., Bristol, Pa.					
294	Danish Round Head Short Stem, No. 250. Worcester Grain & Coal Co., Worcester	82	1/1942	64‡	April
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
261	Danish Ball Head Short Stem, No. 9511. Pierce Hardware Co., Taunton	80 +	1/1942	46‡	April
262	Golden Acre, No. 10511. Pierce Hardware Co., Taunton	80 +	1/1942	39‡	April
263	Copenhagen Market, No. 9373. Pierce Hardware Co., Taunton	80 +	1/1942	20‡	April
419	Premier Late Flat Dutch. W. E. Aubuchon Co., Inc., Fitchburg	-	--	43†	April
1135	Danish Ballhead Imported. W. E. Aubuchon Co., Inc., Leominster	-	--	24†	June
1143	Early Jersey Wakefield. United Cooperative Farmers, Inc., Fitchburg	-	--	76	June
1146	Danish Ball Head Short Stem, No. 9521. United Cooperative Farmers, Inc., Fitchburg	80 +	1/1942	89	June
THE PAGE SEED CO., Greene, N. Y.					
1160	Danish Ball Head, No. El. 7141. Bengston Hardware Co., Gardner	Approx. 75	12/1941	78	June
PERRY SEED CO., Boston, Mass.					
56	Golden Acre, No. 1806.	-	--	94	April
J. B. RICE, JR., INC., Shushan, N. Y.					
136	Danish Ballhead. John M. Fitzgerald Co., Taunton	Approx. 70	11/1941	56‡	May
ROSS BROS. CO., Worcester, Mass.					
574	Danish Ballhead. A. S. Tucker, Hardware, Warren	-	--	84	May
F. H. WOODRUFF & SONS, Milford, Conn.					
191	Golden Acre, No. 18783. Middlesex County Farm Bureau Assoc., Waltham	Approx. 90	12/1941	91	April
464	Golden Acre, No. 14287. Middlesex County Farm Bureau Assoc., Worcester	82	11/1940	61‡	April
530	Copenhagen Market. Winers Hardware Stores, Inc., Whitman	-	--	81	April

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
CABBAGE—Concluded					
F. H. WOODRUFF & SONS—Continued					
884	Mammoth Red Rock Pittsfield Hardware & Plumbing Supply Co., Pittsfield	-	—	95	May
1063	Copenhagen Market Haverhill Hardware & Plumbing Supply Co., Haverhill	-	—	91	June
S. D. WOODRUFF & SONS, Orange, Conn.					
833	Danish Ballhead, No. 2323 Adams Hardware & Paint Co., Adams	62	1/1942	67	May
		Below Stand.			
835	Jersey Wakefield, No. 1290 Adams Hardware & Paint Co., Lowell	66	1/1942	74	May
		Below Stand.			
UNKNOWN					
809	Charleston Wakefield Danvers Hardware Co., Danvers	-	—	19†	May
810	Copenhagen Market Danvers Hardware Co., Danvers	-	—	84	May
811	All Season Danvers Hardware Co., Danvers	-	—	4†	May
992	Early Winingstadt Burlingame & Darbys Co., No. Adams	-	—	0†	June
1000	Ea. Jersey Wakefield Lev Hardware Co., No. Adams	-	—	0†	June
CARROT					
Standard Germination 55%					
ASSOCIATED SEED GROWERS, INC., New Haven, Conn.					
167F	Imperator W. G. Pearse & Co., Fall River	75	11/1941	81	April
312F	Danvers Half Long Clark Hardware Co., Greenfield	55	11/1941	64	May
362F	Long Orange Shurtleff Hardware Co., Middleboro	61	1/1942	69	April
365F	Danvers Half Long Shurtleff Hardware Co., Middleboro	-	—	73	April
392F	Danvers Half Long Leon Zocchi, Milford	55	2/1942	78	April
562F	Danvers Half Long Checkerboard Feed Store, Palmer	-	—	55	May
JOSEPH BRECK & SONS, Boston, Mass.					
20F	Chantenay	-	—	88	April
412F	Danvers Charles A. Smith Co., Millis	-	—	77	April
550F	Breck's Hutchinson H. J. Croteau, Northampton	-	—	73	April
W. ATLEE BURPEE CO., Philadelphia, Pa.					
103F	Chantenay F. Richmond & Co., Brockton	-	—	69	April

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
CARROT—Continued					
	W. ATLEE BURPEE CO.—Continued	Approx.			
307F	Chantenay, No. 15636..... S. Allen's Sons, Greenfield	55	1/1942	71	May
308F	Danvers Half Long, No. 23728..... S. Allen's Sons, Greenfield	55	1/1942	76	May
CARMEL GIFT MAKERS, Carmel, Cal.					
761-h	Chantenay..... R. H. White Co., Boston	-	—	82	May
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
38F	Improved Long Orange..... J. H. Ogden & Co., New Bedford	-	—	67	May
48F	Danvers Half Long..... A. E. Wordell, New Bedford	-	—	78	April
105F	Hutchinson..... F. Richmond & Co., Brockton	-	—	66	April
327F	Hutchinson..... Foster Farrar Co., Northampton	72	12/1941	65	May
CROSMAN SEED CORPORATION, East Rochester, N. Y.					
107F	Danvers Half Long..... S. S. Kresge Co., Brockton	60	—	71	May
762-c	Chantenay..... S. S. Kresge Co., Boston	60	—	60	May
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
62F	Hutchinson, No. 14512..... Eastern States Farmers' Exchange, Waltham	80	12/1941	82	April
341F	Imperator, No. 618..... Eastern States Farmers' Exchange, Northampton	75	12/1941	82	May
342F	Chantenay (Red Cored), No. 618..... Eastern States Farmers' Exchange, Northampton	60	12/1941	64	May
THOMAS W. EMERSON CO., Beverly, Mass.					
187F	Hutchinson..... Middlesex County Farm Bureau Assoc., Waltham	78	1/1942	60§	April
206F	Red Cored Chantenay.....	-	—	73	April
216F	Early Scarlet Horn, No. 1.....	-	—	69	May
384F	Danvers Half Long..... A. J. Cataldo & Sons, Franklin	-	—	87	April
EMPIRE SEED CO., Fredonia, N. Y.					
347F	Chantenay..... Woodlawn Supply Co., South Hadley	-	—	58	May
FERRY-MORSE SEED CO., Detroit, Mich.					
271F	Long Orange..... Copeland Hardware Co., Taunton	-	—	66	April
272F	Danvers Half Long..... Copeland Hardware Co., Taunton	-	—	87	May
493F	Red Cored Chantenay..... Carlisle Hardware Co., Springfield	-	—	66	April

§ Above Standard but below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Germination Date	Germination Found %	Month of Test 1942
CARROT—Continued					
613F	FRASER'S, Wellesley, Mass. Chantenay..... R. W. Shattuck Co., Inc., Arlington	80	1/1942	65§	June
546F	FREDONIA SEED CO., Fredonia, N. Y. Danvers Half Long, No. 507..... Morrison Hardware Co., Springfield	-	—	56	April
2F	THOMAS J. GREY CO., Boston, Mass. Early French Forcing.....	-	—	69	April
177F	JOSEPH HARRIS CO., INC., Rochester, N. Y. Danvers Half Long, No. 507..... Joseph Harris Co., Inc., Cambridge	72	—	71	April
178F	Imperator, No. 505..... Joseph Harris Co., Inc., Cambridge	88	1942	82	April
39F	CHARLES C. HART SEED CO., Wethersfield, Conn. Imperator..... J. H. Ogden & Co., New Bedford	-	—	73	May
118F	Danvers Half Long Stump Root..... Pierce Hardware Co., Taunton	63	1/1942	56	April
119F	Danvers Imperator..... Pierce Hardware Co., Taunton	74	12/1941	73	April
284F	Imperator..... Raymonds, Inc., Boston	65	1/1942	77	May
322F	Hutchinson..... James D. Splann Estate, So. Deerfield	65	1/1942	73	May
331F	Hutchinson..... Federal Supply Co., Northampton	70	12/1941	58§	June
372F	Hutchinson..... W. K. Gilmore & Sons, Inc., Medfield	70	12/1941	55#	June
324F	BUDD D. HAWKINS, Reading, Vt. Danvers Half Long..... Waskiewicz Bros., Hadley	-	—	79	May
92F	HYGRADE SEED CO., INC., Fredonia, N. Y. Chantenay Long Type..... Franklin School, Holbrook	-	—	75	April
290F	D. LANDRETH SEED CO., Bristol, Pa. Chantenay Red Cored or Coreless Half Long, No. 250..... Worcester Grain & Coal Co., Worcester	70	1/1942	64	May
291F	Orange Danvers Half Long or Rubicon, No. 250 Worcester Grain & Coal Co., Worcester	71	1/1942	83	May
326F	M. E. MANNING, Hadley, Mass. Hutchinson.....	-	—	74	May
253F	MICHAEL-LEONARD SEED CO., Chicago, Ill. Danvers, No. 15522..... Pierce Hardware Co., Taunton	65+	1/1942	76	April
254F	Chantenay Red Cored, No. 15321..... Pierce Hardware Co., Taunton	65+	1/1942	59	April
270F	Imperator, No. 16021..... Pierce Hardware Co., Taunton	65+	1/1942	85	April

§ Above Standard but below Guarantee.

Equal to Standard but below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
CARROT—Continued					
MICHAEL-LEONARD SEED CO.—Continued					
402F	Danvers W. E. Aubuchon Co., Inc., Milford	-	—	67	April
409F	Improved Long Orange W. E. Aubuchon Co., Inc., Milford	-	—	56	May
418F	Danvers W. E. Aubuchon Co., Inc., Holliston	-	—	76	April
472F	Improved Long Orange, No. 16121 W. E. Aubuchon Co., Inc., Amherst	65	1/1942	58	April
476F	Hutchinson, No. 5921 Mutual Plumbing & Heating Co., Amherst	65+	1/1942	65	April
1144	Chantenay Red Cored United Cooperative Farmers, Inc., Fitchburg	-	—	71	June
NORTHROP, KING & CO., Minneapolis, Minn.					
14F	Chantenay F. W. Woolworth Co., Boston	-	—	60	April
THE PAGE SEED CO., Greene, N. Y.					
162F	Danvers Half Long, No. F 11.8642 Antonio M. Pires, Fall River	Approx. 75	12/1941	81	April
GEORGE R. PEDRICK & SON, Pedricktown, N. J.					
440F	Hutchinson The Continental Nurseries, Franklin	88	12/1941	92	May
PERRY SEED CO., Boston, Mass.					
49F	Hutchinson, No. 2150	-	—	82	May
JEROME B. RICE SEED CO., Cambridge, N. Y.					
76F	Chantenay Middlesex County Farm Bureau Assoc., So. Weymouth	55	12/1941	72	April
J. B. RICE, JR., INC., Shushan, N. Y.					
130F	Improved Long Orange John M. Fitzgerald Co., Taunton	Approx. 52	12/1941	56	April
Approx. 75					
131F	Danvers Half Long John M. Fitzgerald Co., Taunton	Approx. 75	12/1941	85	May
ROSS BROS. CO., Worcester, Mass.					
252F	Danvers Half Long A. I. Task Co., Brockton	-	—	67	May
297F	Chantenay, No. 734 Ross Bros. Co., Worcester	-	—	92	April
298F	Hutchinson, No. 625	-	—	63	April
SARGENT'S GRAIN & SUPPLY CO., Brockton					
245F	Danvers Half Long	-	—	67	April
JOSEPH SORDILLO & SONS, Boston, Mass.					
200F	Long Orange	-	—	89	April
STERLING SEED CO., Minneapolis, Minn.					
89F	Chantenay W. T. Grant Co., Boston	-	—	66	April
VAUGHAN'S SEED STORE, Chicago, Ill.					
645F	Early Chantenay Harold Cogger, Reading	-	—	69	May
F. H. WOODRUFF & SONS, Milford, Conn.					
123F	Improved Long Orange, No. 18544 Waldron Hardware Co., Taunton	Approx. 67	10/1941	62	June

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued
VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
CARROT—Concluded					
F. H. WOODRUFF & SONS—Continued					
124F	Danvers Half Long, No. 18964 Waldron Hardware Co., Taunton	Approx. 87	12/1941	80	April
157F	Danvers Half Long, No. 1-3326 Jose J. D'Aruda, Fall River	Approx. 90	11/1941	95	April
367F	Danvers Half Long, No. 21516 Farm Service Co., Middleboro	Approx. 69	1/1942	78	April
433F	Chantenay Milford Hardware, Inc., Milford	-	—	79	April
466F	Danvers Half Long, No. 8020 Middlesex County Farm Bureau Assoc., Worcester	-	—	55	April
469F	Danvers Half Long, No. 17988 Middlesex County Farm Bureau Assoc., Worcester	Approx. 53	2/1941	66	April
816F	Danvers Half Long, No. 17988 Danvers Hardware Co., Danvers	51	10/1940	62	May
956	Perfection E. A. Noble & Co., Stockbridge	Below Stand. 46	11/1941	40‡	June
1064	Chantenay Red Cored, No. 1-182 Haverhill Hardware & Plumbing Supply Co., Haverhill	-	—	79(c)	June
S. D. WOODRUFF & SONS, Orange, Conn.					
233F	Hutchinson, No. 2319 Monroe's Seed Market, Attleboro	68	12/1941	63	April
234F	Danvers Half Long, No. 2178 Monroe's Seed Market, Attleboro	70	12/1941	68	April
CAULIFLOWER					
Standard Germination 75%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
887	Early Snowball Frank Howard, Inc., Pittsfield	90	9/1941	96	May
CROSMAN SEED CORPORATION, East Rochester, N. Y.					
575	Early Snowball S. S. Kresge Co., Quincy	75	Packed for 1942	82	May
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
66	Early Snowball, No. 5111 Eastern States Farmers' Exchange, Waltham	85	12/1941	92	April
FERRY-MORSE SEED CO., Detroit, Mich.					
620	Early Snowball Craigie Hardware Co., Somerville	-	Packed for 1942	69‡	May
CHARLES C. HART SEED CO., Wethersfield, Conn.					
963	Early Snowball Berkshire Hardware Co., Pittsfield	Below Stand. 75	1/1942	54‡	June

(c) Wholesaler claims seed not sold by him, at least not during current year.

‡ Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
CAULIFLOWER—Concluded					
1173	BUDD D. HAWKINS, Reading, Vt. Early Snowball..... Orange Hardware Co., Orange	-	—	43†	June
787	JEROME B. RICE SEED CO., Cambridge, N. Y. Early Snowball..... Kingston Hardware Co., Kingston	75	12/1941	77	June
748	F. H. WOODRUFF & SONS, Milford, Conn. Early Snowball..... Boston Supply Co., Framingham	-	—	76	June
CELERY					
Standard Germination 55%					
886	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Dwarf Golden Self Blanching..... Frank Howard, Inc., Pittsfield	81	9/1941	81	May
603	COMSTOCK, FERRE & CO., Wethersfield, Conn. Pascal..... Central Hardware Co., Woburn	-	—	67	May
67	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Pascal (Cal. Strain), No. 621..... Eastern States Farmers' Exchange, Waltham	75	12/1941	80	April
429	THOMAS W. EMERSON CO., Beverly, Mass. White Plume..... F. A. Gould, Milford	-	—	87	April
1172	BUDD D. HAWKINS, Reading, Vt. New White Plume..... Orange Hardware Co., Orange	-	—	17†	June
1153	MICHAEL-LEONARD SEED CO., Chicago, Ill. Golden Self Blanching..... Central Hardware Co., Fitchburg	-	—	4†	June
434	F. H. WOODRUFF & SONS, Milford, Conn. Easy Blanching..... Milford Hardware Co., Milford	-	—	76	April
845	UNKNOWN Boston Market..... Middlesex Supply Co., Lowell	-	—	82	May
SWISS CHARD					
Standard Germination 65%					
364	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Lucullus..... Shurtleff Hardware Co., Middleboro	69	10/1941	86	April
29	JOSEPH BRECK & SONS, Boston, Mass. Dark Green White Ribbed, No. C 382.....	-	—	85	April
761-k	CARMEL GIFT MAKERS, Carmel, Cal. Large Ribbed..... R. H. White Co., Boston	-	—	82	June

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued
 VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Germination Date	Germination Found %	Month of Test 1942
SWISS CHARD—Concluded					
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
612	Giant Lucullus..... R. W. Shattuck Co., Inc., Arlington	-	—	76	May
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
68	Ford Hook Giant, No. 711..... Eastern States Farmers' Exchange, Waltham	75	12/1941	80	April
THOMAS W. EMERSON CO., Beverly, Mass.					
223	Broad Rib Green, No. 90.....	78	12/1941	90	April
313	Lucullus..... Clark Hardware Co., Greenfield	-	1942	81	April
601	Lucullus..... Arlington Hardware Co., Arlington	-	—	91	May
650	Swiss Chard*..... Bellingham Hardware Co., Weymouth	-	—	80	May
BUDD D. HAWKINS, Reading, Vt.					
1097	Swiss Chard*..... Albert P. Wilson, Newburyport	-	—	74	June
D. LANDRETH SEED CO., Bristol, Pa.					
590	Lucullus..... Salem Hardware Co., Salem	75 or Better	1/1942	83	May
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
420	Silver..... W. E. Aubuchon Co., Inc., Fitchburg	-	—	90	April
481	Lucullus No. 3821..... Mutual Plumbing & Heating Co., Amherst	70+	1/1942	88	April
F. H. WOODRUFF & SONS, Milford, Conn.					
549	Lucullus, No. 18952..... H. J. Croteau, Northampton	Approx. 84	12/1941	90	May
UNKNOWN					
985	Common Green..... Phillips General Store, Williamstown	-	—	77	June
CHICORY					
Standard Germination 65%					
EMPIRE SEED CO., Fredonia, N. Y. Below Stand.					
936	Witloof..... Ely's Market, Great Barrington	Approx. 20	12/1941	26	May
F. H. WOODRUFF & SONS, Milford, Conn. Approx.					
750	Witloof or French Endive, No. 18529..... Boston Supply Co., Framingham	54	12/1941	58	May
CORN					
Standard Germination 75%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
395	Golden Bantam 8 Rowed..... Leon Zoehi, Milford	90	10/1941	96	April
778	Whipple's Early Yellow, No. 26068..... Thornton & Crouch, Lawrence	90	10/1941	87	June
972	Marcross..... Checkerboard Feed Store, Pittsfield	-	—	86	June

* Information required by law not given.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
CORN—Continued					
25	JOSEPH BRECK & SONS, Boston, Mass. Golden Cross Bantam, No. 390	-	-	72†	April
400	W. ATLEE BURPEE CO., Philadelphia, Pa. Sunshine Wm. H. Casey Store, Milford	85	2/1942	88	April
759	Golden Bantam, No. 301 Baker Hardware Co., Wellesley	Approx. 85	12/1941	78	June
1032	COBURN SEED & SUPPLY CO., Chelmsford, Mass. Bantam Evergreen, No. 3623	-	-	84	June
46	COMSTOCK, FERRE & CO., Wethersfield, Conn. Golden Bantam A. E. Wordell, New Bedford	-	-	93	April
159	Marcross 13 x 6 Jose J. D'Aruda, Fall River	-	-	95	April
1010	ARTHUR R. CONE, Buffalo, N. Y. Stowell's Evergreen, No. 50-251 Sunshine Feed Store, Westfield	92	3/1942	97	June
1029	THOMAS W. EMERSON CO., Beverly, Mass. Golden Sunshine Concord Hardware Co., Concord	-	-	85	June
501	FERRY-MORSE SEED CO., Detroit, Mich. Whipple's Early Yellow Carlisle Hardware Co., Springfield	-	-	93	April
725	Golden Bantam, No. 69719 Reliable Hardware Co., Mattapan	-	-	89	June
10	THOMAS J. GREY CO., Boston, Mass. Golden Cross Bantam	-	-	89	April
183	JOSEPH HARRIS CO., INC., Rochester, N. Y. Golden Cross Bantam, No. 1267 Joseph Harris Co., Inc., Cambridge	99	1942	97	April
378	CHARLES C. HART SEED CO., Wethersfield, Conn. Whipple's Early Yellow Millis Coal & Grain Co., Millis	90	12/1941	63‡	April
784	Corn Hybrid Marcross H. K. Webster Co., Lawrence	90	1/1942	88	June
794	Early Golden Bantam Plymouth Supply Co., Plymouth	90	1/1942	79§	June
295	D. LANDRETH SEED CO., Bristol, Pa. Golden Cross Bantam, No. 1630 Worcester Grain & Coal Co., Worcester	-	1/1942	87	April
1094	MICHAEL-LEONARD SEED CO., Chicago, Ill. Golden Evergreen F. B. Keene, Amesbury	87	12/1941	63‡	June
521	THE PAGE SEED CO., Greene, N. Y. Whipple's Early Yellow, No. B 31 141 Harry Seder, Webster	Approx. 85	12/1941	94	May

† Below Standard.

‡ Below Standard and below Guarantee.

§ Above Standard but below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
CORN—Concluded					
522	THE PAGE SEED CO.—Continued Golden Bantam, No. B 7-142..... Harry Seder, Webster	90	2/1942	90	May
918	Stowell's Evergreen, No. B 18-5542..... Arthur W. Baldwin, West Stockbridge	90	1/1942	88	June
61	PERRY SEED CO., Boston, Mass. Golden Cross Bantam, No. 2660.....	-	—	89	April
572	ROSS BROS. CO., Worcester, Mass. Golden Giant, No. 322..... A. R. Tucker, Hardware, Warren	98	1/1942	89§	June
247	SARGENT'S GRAIN & SUPPLY CO., Brockton, Mass. Golden Hummer.....	-	—	95	April
197	F. H. WOODRUFF & SONS, Milford, Conn. Marcross 6 x 13, No. 20037..... Middlesex County Farm Bureau Assoc., Waltham	90	12/1941	97	April
369	Golden Cross Bantam, No. 20102..... Farm Service Co., Middleboro	97	12/1941	96	April
958	Woodruff's Earligold, No. 21070..... E. A. Noble & Co., Stockbridge	-	—	97	June
CRESS					
Standard Germination 40%					
761-g	CARMEL GIFT MAKERS, Carmel, Cal. Fine Curled..... R. H. White Co., Boston	-	—	90	May
695	FERRY-MORSE SEED CO., Detroit, Mich. Curled or Pepper Grass..... Jordan Marsh Co., Boston	-	Packed for 1942	85	May
CUCUMBER					
Standard Germination 80%					
484	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Boston Pickling..... Checkerboard Feed Store, Amherst	-	—	96	April
505	Improved Long Green..... Methe's Checkerboard Store, Springfield	-	—	89	April
30	JOSEPH BRECK & SONS, Boston, Mass. Straight Eight, No. C 196.....	-	—	91	April
396	W. ATLEE BURPEE CO., Philadelphia, Pa. Long Green..... Wm. H. Casey Store, Milford	80	1/1942	86	April
761-d	CARMEL GIFT MAKERS, Carmel, Cal. Early White Spine..... R. H. White Co., Boston	-	—	99	June
764	COMSTOCK, FERRE & CO., Wethersfield, Conn. Improved Long Green..... H. Bruckmann, Lawrence	-	—	74†	June

§ Above Standard but below Guarantee.

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
CUCUMBER—Concluded					
219	THOMAS W. EMERSON CO., Beverly, Mass. Straight Eight, No. 1	-	—	93	April
648	Boston Pickling Stoneham Paint & Hardware Supply Co., Stoneham	-	—	96	April
345	CHARLES C. HART SEED CO., Wethersfield, Conn. Boston Pickling J. Russell & Co., Holyoke	90	12/1941	92	April
1085	BUDD D. HAWKINS, Reading, Vt. Improved Long Green Herman F. Davis, Merrimac	-	—	81	June
260	MICHAEL-LEONARD SEED CO., Chicago, Ill. A & C, No. 24211 Pierce Hardware Co., Taunton	84	1/1942	96	April
269	Davis Perfect, No. 24522 Pierce Hardware Co., Taunton	84	1/1942	80	April
408	Improved Long Green W. E. Aubuchon Co., Inc., Milford	-	—	92	April
421	Green Prolific or Boston Pickling W. E. Aubuchon Co., Inc., Holliston	-	—	59†	April
938	Early Cluster, No. 23924 Manchester Forbes Co., Easthampton	84+	1/1942	95	June
524	THE PAGE SEED CO., Greene, N. Y. Long Green, No. 14.4141 Gatzke Hardware Co., Webster	Approx. 80	1/1942	89	April
57	PERRY SEED CO., Boston, Mass. Arlington White Spine, No. 2863	-	—	95	April
984	JEROME B. RICE SEED CO., Cambridge, N. Y. White Spine Arthur E. Sherman, Lanesboro	90	1/1942	94	June
320	F. H. WOODRUFF & SONS, Milford, Conn. Boston Pickling, No. 8-37 James D. Splann Estate, So. Deerfield	90	12/1941	97	April
321	Black Diamond, 8-864 James D. Splann Estate, So. Deerfield	Approx. 90	12/1941	90	April
240	S. D. WOODRUFF & SONS, Orange, Conn. White Spine, No. 2291 Monroe's Seed Market, Attleboro	80	12/1941	64‡	April
266	Long Green, No. 1310 Pierce Hardware Co., Taunton	82	12/1941	32‡	April
831	Boston Pickling, No. 2293 Adams Hardware & Paint Co., Lowell	90	12/1941	93	May
840	Woodruff's A & C, No. 1551 Adams Hardware & Paint Co., Lowell	82	12/1941	80	May
1002	UNKNOWN Boston Pickling Lev Hardware Co., No. Adams	-	—	80	June

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
DANDELION					
Standard Germination 45%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
1015	Improved Thick Leaf Checkerboard Feed Store, Westfield	-	—	80	June
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
825	Improved Thick Leaf Essex County Cooperative Farming Association, Topsfield	-	—	77	May
FERRY-MORSE SEED CO., Detroit, Mich.					
497	Improved Thick Leaved Carlisle Hardware Co., Springfield	-	—	0†	April
JEROME B. RICE SEED CO., Cambridge, N. Y.					
917	Improved Thick Leaf N. R. Wheeler, Richmond	70	12/1941	87	May
ROSS BROS. CO., Worcester, Mass.					
394	Catalogna Leon Zocchi, Milford	73	1/1942	76	May
EGG PLANT					
Standard Germination 60%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
888	New York Spineless Frank Howard, Inc., Pittsfield	90	1/1942	89	May
W. ATLEE BURPEE CO., Philadelphia, Pa.					
763	Black Beauty H. Bruckmann, Lawrence	-	—	76	May
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
69	Black Beauty, No. 2018 Eastern States Farmers' Exchange, Waltham	80	—	89	April
FERRY-MORSE SEED CO., Detroit, Mich.					
499	Improved Large Purple Carlisle Hardware Co., Springfield	-	—	88	April
FRASER'S, Wellesley, Mass.					
856	Black Beauty	Approx. 65	1942	71	May
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
1051	Improved New York Purple F. X. Robichaud, Methuen	-	—	71	June
NORTHROP, KING & CO., Minneapolis, Minn.					
983	New York Spineless Arthur E. Sherman, Lanesboro	-	—	85	June
PERRY SEED CO., Boston, Mass.					
55	New York Improved, No. 3090	-	—	96	April
ENDIVE					
Standard Germination 70%					
JOSEPH BRECK & SONS, Boston, Mass.					
795	Broad Leaved Escarole John E. Jordan Co., Plymouth	-	—	86	May

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Germination Date	Germination Found %	Month of Test 1942
ENDIVE—Concluded					
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
605	Broad Leaf Central Hardware Co., Woburn	-	—	89	May
THE FISKE CORPORATION, Natick, Mass.					
755	Broad Leaf Batavian	-	—	90	May
FREDONIA SEED CO., Fredonia, N. Y.					
792	Large Green Curled G. Canovaro, Hardware & Paint Co., No. Plymouth	-	—	84	May
BUDD D. HAWKINS, Reading, Vt.					
1158	Green Curled or Giant Fringed Oyster Bengston Hardware Co., Gardner	-	—	83	June
D. LANDRETH SEED CO., Bristol, Pa.					
776	Broad Leaved Batavian Essex Hardware & Plumbing Supply Co., Lawrence	-	—	83	May
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
404	Broad Leaved Bavarian, No. 28512 W. E. Aubuchon Co., Inc., Milford	75	12/1940	80	April
1006	Broad Leaved Batavian W. E. Aubuchon Co., Inc., Shelburne Falls	-	—	84	June
THE PAGE SEED CO., Greene, N. Y.					
525	Broad Leaved Batavian, No. M 11 4-42 Gatzke Hardware Co., Webster	Approx. 85	12/1941	91	April
KALE					
Standard Germination 75%					
EMPIRE SEED CO., Fredonia, N. Y.					
538	Dwarf Green Curled Scotch D. F. Mazzaferro, Springfield	Below Stand. 35%	12/1941	45	April
KOHL RABI					
Standard Germination 75%					
CROSMAN SEED CORPORATION, East Rochester, N. Y.					
577	Early White Vienna S. S. Kresge Co., Quincy	75	Packed for 1942	90	May
EMPIRE SEED CO, Fredonia, N. Y.					
539	Early Purple Vienna D. F. Mazzaferro, Springfield	Below Stand. 45	12/1941	49	April
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
937	Early White Vienna, No. 32101 Manchester Forbes Co., Easthampton	80	1/1942	71‡	June
1155	Early White Vienna Central Hardware Co., Fitchburg	-	—	14†	June
LEEK					
Standard Germination 60%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
1014	London Flag Checkerboard Feed Store, Westfield	-	—	43†	June

‡ Below Standard and below Guarantee.

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
LEEK—Concluded					
173	COMSTOCK, FERRE & CO., Wethersfield, Conn. American Broad Flag..... G. W. Gardiner & Sons, Fall River	-	—	72	April
222	THOMAS W. EMERSON CO., Beverly, Mass. American Flag, No. 1.....	-	—	31†	April
1057	MICHAEL-LEONARD SEED CO., Chicago, Ill. Large American Flag..... F. X. Robichaud, Methuen	-	—	12†	June
1058	F. H. WOODRUFF & SONS, Milford, Conn. American Flag..... Haverhill Hardware & Plumbing Supply Co., Haverhill	-	—	53†(c)	June
LETTUCE					
Standard Germination 80%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
393	Black Seeded Simpson..... Leon Zocchi, Milford	90	1/1942	96	April
561	Iceberg..... Checkerboard Feed Store, Palmer	-	—	98	May
973	Big Boston..... Checkerboard Feed Store, Pittsfield	-	—	98	June
993	Early Curled Simpson..... Burlingame & Darbys Co., No. Adams	90	11/1941	95	June
28	JOSEPH BRECK & SONS, Boston, Mass. N. Y. Special #12, No. C 189.....	-	—	95	April
397	W. ATLEE BURPEE CO., Philadelphia, Pa. Dwarf White Heart Cos..... Wm. H. Casey Store, Milford	80	1/1942	98	April
730	Imperial 847..... The Fair, Roslindale	-	—	93	May
761-f	CARMEL GIFT MAKERS, Carmel, Cal. Hanson Firm Heading..... R. H. White Co., Boston	-	—	93	May
766	COMSTOCK, FERRE & CO., Wethersfield, Conn. Iceberg..... H. Bruckmann, Lawrence	-	—	98	May
1119	Black Seeded Tennisball..... Bell Hardware Co., Stoneham	-	—	97	June
762-a	CROSMAN SEED CORPORATION, East Rochester, N. Y. Grand Rapids, Leaf..... S. S. Kresge Co., Boston	80	—	83	May
70	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. N. Y. #12, No. 711..... Eastern States Farmers' Exchange, Waltham	90	12/1941	96	April

† Below Standard.

(c) Wholesaler claims seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
LETTUCE—Continued					
215	THOMAS W. EMERSON CO., Beverly, Mass. Imperial #44, No. 1	-	—	99	April
379	Black Seeded Tennisball A. J. Cataldo & Sons, Franklin	-	—	41†	April
649	Big Boston Bellingham Hardware Co., Weymouth	-	—	85	May
1171	Iceberg Orange Hardware Co., Orange	-	—	80	June
934	EMPIRE SEED CO., Fredonia, N. Y. Early Prize Head Ely's Market, Great Barrington	Below Stand. Approx. 50	12/1941	61	May
951	Early Prize Head H. C. Puffer Company, Huntington	Below Stand. 50	12/1941	53	June
952	Paris White Cos. H. C. Puffer Company, Huntington	-	—	93	June
496	FERRY-MORSE SEED CO., Detroit, Mich. New York Carlisle Hardware Co., Springfield	-	—	2†	April
805	FRASER'S, Wellesley, Mass. Black Seeded Tennisball Plymouth Rock Hardware Co., Plymouth	Approx. 95	1/1942	98	May
11	THOMAS J. GREY CO., Boston, Mass. Imperial "44"	-	—	97	April
182	JOSEPH HARRIS CO., INC., Rochester, N. Y. White Boston, No. 675 Joseph Harris Co., Inc., Cambridge	99	—	98	April
334	CHARLES C. HART SEED CO., Wethersfield, Conn. N. Y. Head Federal Supply Co., Northampton	-	—	95	April
785	Big Boston H. K. Webster Co., Lawrence	78	1/1942	58‡	May
876	Simpson's Early Curled Carr Hardware Co., Pittsfield	-	—	85	May
979	May King The Hardware Shop, Adams	88	1/1942	94	June
1096	BUDD D. HAWKINS, Reading, Vt. Early Prize Head Albert P. Wilson, Newburyport	-	—	87	June
96	HYGRADE SEED CO., Fredonia, N. Y. Black Seeded Simpson Franklin School, Holbrook	-	—	98	April
140	Grand Rapids Allen School, East Bridgewater	-	—	98	April
293	D. LANDRETH SEED CO., Bristol, Pa. Iceberg, No. 60 Worcester Grain & Coal Co., Worcester	80	1/1942	76†	April
772	Black Seeded Tennisball Essex Hardware & Plumbing Supply Co., Lawrence	-	—	6†	May

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
LETTUCE—Continued					
818	D. LANDRETH SEED CO.—Continued N. Y. #12..... Parker's Farm Supply Store, Danvers	82	—	97	May
744	LITTLE TREE FARMS, Framingham Center, Mass. Iceberg.....	-	—	59†	May
264	MICHAEL-LEONARD SEED CO., Chicago, Ill. Big Boston No. 33211..... Pierce Hardware Co., Taunton	80+	1/1942	43‡	April
265	Romaine Cos, No. 36412..... Pierce Hardware Co., Taunton	80+	1/1942	25‡	April
403	Prizehead..... W. E. Aubuchon Co., Inc., Milford	-	—	45†	April
417	Big Boston..... W. E. Aubuchon Co., Inc., Holliston	-	—	0†	April
422	Iceberg..... W. E. Aubuchon Co., Inc., Holliston	-	—	14†	April
600	Iceberg..... Winer Bros., Inc., Beverly	70	3/1942	76	May
1007	Big Boston..... W. E. Aubuchon Co., Inc., Shelburne Falls	-	—	0†	June
1145	Early Curled Simpson..... United Cooperative Farmers, Inc., Fitchburg	-	—	19†	June
1154	Big Boston..... Central Hardware Co., Fitchburg	-	—	95	June
1161	Iceberg..... W. E. Aubuchon Co., Inc., Gardner	-	—	91	June
921	THE PAGE SEED CO., Greene, N. Y. Imperial #14..... Snyder's Store, Hoosatonc	Approx. 90	12/1941	98	May
443	GEORGE R. PEDRICK & SONS, Pedricktown, N. J. Boston Market..... The Continental Nurseries, Franklin	90	1/1942	99	April
54	PERRY SEED CO., Boston, Mass. N. Y. or Wonderful #12, No. 3605.....	-	—	93	April
977	JEROME B. RICE SEED CO., Cambridge, N. Y. Boston Prize Head..... Murphy's Pharmacy, Adams	-	—	0†(c)	June
137	J. B. RICE, JR., INC., Shushan, N. Y. Early Curled Simpson..... John M. Fitzgerald Co., Taunton	Approx. 60	11/1941	53‡	April
304	ROSS BROS. CO., Worcester, Mass. Prizehead, No. 718.....	-	—	95	April
647	VAUGHAN'S SEED STORE, Chicago, Ill. Grand Rapids Forcing..... Harold Cogger, Reading	-	—	92	May

† Below Standard.

‡ Below Standard and below Guarantee.

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1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
LETTUCE—Concluded					
192	F. H. WOODRUFF & SONS, Milford, Conn. White Boston, No. 1-3142 Middlesex County Farm Bureau Assoc., Waltham	Approx. 90	12/1941	99	April
438	N. Y. or Wonderful Milford Hardware, Inc., Milford	-	—	53†(c)	April
531	Big Boston Winer's Hardware Stores, Inc., Whitman	-	—	59†(c)	April
535	New York Agawam Public Market, Agawam	-	—	4†(c)	April
929	Ea. Curled Silesia Platt & Goslee, Great Barrington	Approx. 95	12/1941	100	May
316	UNKNOWN Big Boston Clark Hardware Co., Greenfield	-	—	97	April
MUSKMELON					
Standard Germination 75%					
824	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Bender's Surprise Essex County Cooperative Farming Association, Topsfield	90	11/1941	94	June
857	FRASER'S, Wellesley, Mass. Hale's Best	Approx. 90	1942	94	June
ONION					
Standard Germination 70%					
844	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Yellow Globe Danvers Middlesex Supply Co., Lowell	-	—	74	May
18	JOSEPH BRECK & SONS, Boston, Mass. Yellow Globe Danvers, No. C 129	-	—	96	April
26	Danvers Yellow Globe, No. C 376	-	—	99	April
149	W. ATLEE BURPEE CO., Philadelphia, Pa. Southport Yellow Globe Brownell Hardware Co., Attleboro	75	12/1941	51‡	April
47	COMSTOCK, FERRE & CO., Wethersfield, Conn. Yellow Globe Danvers A. E. Wordell, New Bedford	-	—	89	April
112	Prizetaker Frank P. Mills, Campello	-	—	73	April
175	Wethersfield Large Red G. W. Gardiner & Sons, Fall River	-	—	95	April
328	Japanese Foster Farrar Co., Northampton	92	12/1941	87	April
329	White Portugal Foster Farrar Co., Northampton	91	1/1942	95	April

† Below Standard.

‡ Below Standard and below Guarantee.

(c) Wholesaler claims seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
ONION—Continued					
606	COMSTOCK, FERRE & CO.—Continued Yellow Globe Central Hardware Co., Woburn	—	—	65†	May
108	CROSMAN SEED CORPORATION, East Rochester, N. Y. Yellow Globe Danvers S. S. Kresge Co., Boston	75	1942	63‡	April
340	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Ebenezer, No. 2410 Eastern States Farmers' Exchange, Northampton	95	12/1941	94	April
208	THOMAS W. EMERSON CO., Beverly, Mass. Prizetaker, No. 1	—	—	16†	April
220	White Portugal, No. 1	—	—	86	April
385	Yellow Globe Danvers A. J. Cataldo & Sons, Franklin	—	—	92	April
428	Red Globe F. A. Gould, Milford	—	—	2†	April
1028	Yellow Globe Danvers Concord Hardware Co., Concord	—	—	34†	June
490	FERRY-MORSE SEED CO., Detroit, Mich. Southport White Globe Carlisle Hardware Co., Springfield	—	—	20†	April
563	FREDONIA SEED CO., Fredonia, N. Y. Yellow Globe Danvers Warren Cash Market, Warren	—	—	39†	May
3	THOMAS J. GREY CO., Boston, Mass. Yellow Globe Danvers	—	—	81	April
179	JOSEPH HARRIS CO., INC., Rochester, N. Y. Southport Red Globe, No. 802 Joseph Harris Co., Inc., Cambridge	92	1912	98	April
319	CHARLES C. HART SEED CO., Wethersfield, Conn. Japanese or Ebenezer James D. Splann Estate, So. Deerfield	81	—	84	April
343	Yellow Valencia J. Russell & Co., Holyoke	72	12/1941	68‡	April
350	Yellow Globe Danvers Woodlawn Supply Co., So. Hadley	78	1/1942	66‡	April
323	BUDD D. HAWKINS, Reading, Vt. Yellow Globe Danvers John Waskiewicz, Hadley	—	—	43†	April
1095	Large Red Wethersfield Albert P. Wilson, Newburyport	—	—	15†	June
292	D. LANDRETH SEED CO., Bristol, Pa. Yellow Globe Danvers, No. 295 Worcester Grain & Coal Co., Worcester	70	1/1942	18‡	April
586	Yellow Globe Danvers Salem Hardware Co., Salem	70	1/1942	17‡	May

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
ONION—Continued					
325	M. E. MANNING, Hadley, Mass. Early Globe.....	-	—	90	April
117	MICHAEL-LEONARD SEED CO., Chicago, Ill. Yellow Globe Danvers, No. 50872..... Pierce Hardware Co., Taunton	80	1/1942	18‡	April
120	Southport Red Globe, No. 52111..... Pierce Hardware Co., Taunton	80	1/1942	41‡	April
268	White Portugal or Am. Silverskin, No. 52716 .. Pierce Hardware Co., Taunton	80 +	1/1942	48‡	April
410	Yellow Globe Danvers..... W. E. Aubuchon Co., Inc., Milford	-	—	82	April
470	Yellow Globe Danvers, No. 11..... W. E. Aubuchon Co., Inc., Amherst	70 +	12/1940	87	April
598	Yellow Globe Danvers..... Winer Bros., Inc., Beverly	70	3/1942	19‡	May
872	Yellow Globe Danvers..... John S. Glennon, Hardware, Dalton	-	—	15†	May
907	Yellow Globe Danvers, No. 50821..... Peirson Hardware Co., Pittsfield	80 +	1/1942	74	May
908	Large Red Wethersfield, No. 52314..... Peirson Hardware Co., Pittsfield	50	1/1942	37‡	May
1009	Yellow Globe Danvers..... W. E. Aubuchon Co., Inc., Shelburne Falls	-	—	12†	June
1054	Southport Red Globe, No. 52111..... F. X. Robichaud, Methuen	50 +	1/1942	39‡	June
1056	Southport White Globe..... F. X. Robichaud, Methuen	-	—	88	June
15	NORTHRUP, KING & CO., Minneapolis, Minn. Yellow Globe Danvers..... F. W. Woolworth Co., Boston	-	—	70	April
42	THE PAGE SEED CO., Greene, N. Y. Prizetaker..... Weld Square Hardware Co., New Bedford	85	1941	94	April
165	Large Red Wethersfield, No. S 1.7541..... Antonio M. Pires, Fall River	80	12/1941	93	April
441	GEORGE R. PEDRICK & SONS, Pedricktown, N. J. Danvers Yellow..... The Continental Nurseries, Franklin	92	12/1941	78§	April
50	PERRY SEED CO., Boston, Mass. Danvers Yellow Globe, No. 3854.....	-	—	88	April
299	ROSS BROS. CO., Worcester, Mass. Yellow Globe Danvers, No. 746.....	-	—	93	April
570	Yellow Globe Danvers..... A. S. Tucker, Hardware, Warren	80	1/1942	41‡	May
78	JEROME B. RICE SEED CO., Cambridge, N.Y. Yellow Globe Danvers..... Middlesex County Farm Bureau Assoc., Weymouth	80	12/1941	94	April

† Below Standard.

‡ Below Standard and below Guarantee.

§ Above Standard but below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
ONION—Concluded					
132	J. B. RICE, JR., INC., Shushan, N. Y. Yellow Globe Danvers John M. Fitzgerald Co., Taunton	Approx. 85	11/1941	88	April
201	JOSEPH SORDILLO & SONS, Boston, Mass. Prizetaker	—	—	44†	April
90	STERLING SEED CO., Minneapolis, Minn. Large Red Globe W. T. Grant Co., Boston	—	—	70	April
318	F. H. WOODRUFF & SONS, Milford, Conn. Woodruff's Early Yellow Globe, No. 18913 James D. Splann Estate, So. Deerfield	Below Stand. Approx. 66	12/1941	53‡(x)	April
551	Yellow Globe Danvers, No. 9-383 H. J. Croteau, Northampton	Approx. 85	1/1942	73§	April
882	Southport White Globe Pittsfield Hardware & Plumbing Supply Co., Pittsfield	—	—	65†	May
1059	Red Wethersfield Haverhill Hardware & Plumbing Supply Co., Haverhill	—	—	56†	June
1060	Southport White Globe Haverhill Hardware & Plumbing Supply Co., Haverhill	—	—	40†	June
1061	Yellow Globe Danvers Haverhill Hardware & Plumbing Supply Co., Haverhill	—	—	70	June
235	S. D. WOODRUFF & SONS, Orange, Conn. Yellow Globe Danvers, No. 50 W. Monroe's Seed Market, Attleboro	70	1/1942	33‡	April
547	Japanese H. J. Croteau, Northampton	70	1/1942	53‡	April
829	Yellow Globe Adams Hardware & Paint Co., Lowell	70	12/1941	23‡	May
830	White Portugal, No. 2231 Adams Hardware & Paint Co., Lowell	75	12/1941	45‡	May
506	UNKNOWN Southport White Globe Methe's Checkerboard Store, Springfield	—	—	0†	April
PARSLEY					
Standard Germination 60%					
504	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Champion Moss Curled Methe's Checkerboard Store, Springfield	—	—	79	April
765	COMSTOCK, FERRE & CO., Wethersfield, Conn. Extra Curled Dwarf or Emerald H. Bruckmann, Lawrence	—	—	80	May

† Below Standard.

‡ Below Standard and below Guarantee.

§ Above Standard but below Guarantee.

(x) Wholesaler claims he sold this seed at risk of purchaser on account of germination at time tested.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
PARSLEY—Concluded					
CROSMAN SEED CORPORATION, East Rochester, N. Y.					
580	Extra Double Curled S. S. Kresge Co., Quincy	70	1942	76	May
762-f	Moss Curled Double S. S. Kresge Co., Boston	60	—	76	May
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
71	Paramount or Moss Curled, No. 711 Eastern States Farmers' Exchange, Waltham	65	12/1941	79	April
THOMAS W. EMERSON CO., Beverly, Mass.					
775	Double Curled Essex Hardware & Plumbing Supply Co., Lawrence	—	—	82	May
EMPIRE SEED CO., Fredonia, N. Y.					
537	Plain Semplice D. F. Mazzaferro, Springfield	—	—	60	June
FERRY-MORSE SEED CO., Detroit, Mich.					
495	Champion Moss Curled Carlisle Hardware Co., Springfield	—	—	81	April
CHARLES C. HART SEED CO., Wethersfield, Conn.					
514	Moss Curled Waite Hardware Co., Webster	—	1942	82	May
MICHAEL-LEONARD SEED CO., Chicago, Ill.					
407	Champion Moss Curled W. E. Aubuchon Co., Inc., Milford	—	—	52†	April
JOSEPH SORDILLO & SONS, Boston, Mass.					
202	Italian	—	—	75	April
VAUGHAN'S SEED STORE, Chicago, Ill.					
646	Champion Moss Curled Harold Cogger, Reading	—	—	61	May
F. H. WOODRUFF & SONS, Milford, Conn.					
437	Plain Leaf Milford Hardware Co., Inc., Milford	—	—	80	April
881	Moss Curled Pittsfield Hardware & Plumbing Supply Co., Pittsfield	—	—	83	May
UNKNOWN					
542	Hamburg Rooted Belmont Hardware Co., Springfield	32	3/1942	32	June
PARSNIP					
Standard Germination 60%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
363	Hollow Crown Shurtleff Hardware Co., Middleboro	84	9/1941	94	May
JOSEPH BRECK & SONS, Boston, Mass.					
36	Short Full Crown Lot No. C 282	—	—	74	April
796	Long Smooth White John E. Jordan Co., Plymouth	—	—	83	May

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
PARSNIP—Continued					
848	W. ATLEE BURPEE CO., Philadelphia, Pa. Hollow Crown..... C. B. Coburn Co., Lowell	-	—	60	May
243	COMSTOCK, FERRE & CO., Wethersfield, Conn. Hollow Crown..... Lawson Paint & Seed Co., Brockton	-	—	69	April
213	THOMAS W. EMERSON CO., Beverly, Mass. Hollow Crown.....	-	—	65	April
773	Hollow Crown..... Essex Hardware & Plumbing Supply Co., Lawrence	-	—	1†	May
793	FREDONIA SEED CO., Fredonia, N. Y. Hollow Crown..... G. Canovaro, Hardware & Paint Co., No. Plymouth	-	—	62	May
783	CHARLES C. HART SEED CO., Wethersfield, Conn. Champion Hollow Crown..... H. K. Webster Co., Lawrence	74	1/1942	64‡	May
1098	BUDD D. HAWKINS, Reading, Vt. Improved Hollow Crown..... Albert P. Wilson, Newburyport	-	—	26†	June
587	D. LANDRETH SEED CO., Bristol, Pa. Bloomsdale Reselected Hollow Crown..... Salem Hardware Co., Salem	71	1/1942	84	May
820	Sugar Cup or Hollow Crown..... Parker's Farm Supply Co., Danvers	72	—	88	May
401	MICHAEL-LEONARD SEED CO., Chicago, Ill. Improved Hollow Crown, No. 55911..... W. E. Aubuchon Co., Inc., Milford	65	12/1940	52‡	May
424	Improved Hollow Crown..... W. E. Aubuchon Co., Inc., Holliston	-	—	8†	April
473	Improved Hollow Crown, No. 55911..... W. E. Aubuchon Co., Inc., Amherst	65+	12/1940	62	April
478	Improved Hollow Crown, No. 55921..... Mutual Plumbing & Heating Co., Amherst	65+	1/1942	64	April
1134	Hollow Crown, No. 55922..... W. E. Aubuchon Co., Inc., Leominster	65	1/1942	83	June
41	THE PAGE SEED CO., Greene, N. Y. Hollow Crown..... Weld Hardware Co., New Bedford	Approx. 55	*/1941	55	April
160	F. H. WOODRUFF & SONS, Milford, Conn. All American, No. 9-352..... Jose J. D'Aruda, Fall River	Approx. 90	11/1941	97	April
436	Hollow Crown..... Milford Hardware Co., Milford	-	—	95	April
468	All American, No. 1-0104..... Middlesex County Farm Bureau Assoc., Worcester	Approx. 71	11/1940	29‡	May

* Information required by law not given.

† Below Standard.

‡ Below Standard and below Guarantee.

§ Above Standard but below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
PARSNIP—Concluded					
552	F. H. WOODRUFF & SONS—Continued Hollow Crown, No. 18538..... H. J. Croteau, Northampton	68	11/1941	84	May
836	S. D. WOODRUFF & SONS, Orange, Conn. Parsnip, No. SDN **..... Adams Hardware & Paint Co., Lowell	Below Stand. 29	12/1941	23	May
543	UNKNOWN Hollow Crown..... Belmont Hardware Co., Springfield	82	3/1942	8†	May
999	Parsnip **..... Lev Hardware Co., No. Adams	-	—	3‡	June
PEAS					
Standard Germination 80%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
315	Thomas Laxton..... Clark Hardware Co., Greenfield	85	8/1941	95	April
485	American Wonder..... Checkerboard Feed Store, Amherst	85	10/1941	95	May
W. E. AUBUCHON CO., INC., Fitchburg, Mass.					
425	American Wonder..... W. E. Aubuchon Co., Inc., Holliston	-	—	93	April
1005	Gradus..... W. E. Aubuchon Co., Inc., Shelburne Falls	-	—	92	June
JOSEPH BRECK & SONS, Boston, Mass.					
24	Breck's Improved Telephone, No. C 172.....	-	—	93	April
413	Nott's Excelsior..... Charles A. Smith Co., Millis	-	—	89	May
W. ATLEE BURPEE CO., Philadelphia, Pa.					
309	Burpee's Blue Bantam, No. 23728..... S. Allen's Sons, Greenfield	85	1/1942	86	April
399	Extra Early Gradus..... Wm. H. Casey Store, Milford	85	1/1942	96	May
847	Tall Telephone..... C. B. Coburn Co., Lowell	-	—	95	June
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
244	World's Record..... Lawson Paint & Seed Co., Brockton	91	12/1941	88	April
1113	Tall Telephone..... Stoughton Hardware Co., Stoughton	-	—	91	June
EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass.					
75	Laxton's Progress, No. 2212..... Eastern States Farmers' Exchange, Waltham	90	12/1941	94-1	April
THOMAS W. EMERSON CO., Beverly, Mass.					
431	Little Marvel..... F. A. Gould, Milford	-	—	40†	April

† Below Standard.

‡ Below Standard and below Guarantee.

** Variety required by law but not stated.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
PEAS—Continued					
1045	THOMAS W. EMERSON CO.—Continued Nott's Excelsior Thompson Hardware Co., Lowell	—	—	95	June
502	FERRY-MORSE SEED CO., Detroit, Mich. Laxtonian Carlisle Hardware Co., Springfield	—	—	98	April
9	THOMAS J. GREY CO., Boston, Mass. Blue Bantam	—	—	83	April
184	JOSEPH HARRIS CO., INC., Rochester, N. Y. Hundredfold, No. 944 Joseph Harris Co., Inc., Cambridge	96	1942	96	April
337	CHARLES C. HART SEED CO., Wethersfield, Conn. Gradus Federal Supply Co., Northampton	—	—	93	April
375	Tall Telephone W. K. Gilmore & Sons, Inc., Medfield	90	1/1942	84	May
513	Gradus Waite Hardware Co., Webster	—	—	67†	May
961	Dwarf Telephone Berkshire Hardware Co., Pittsfield	90	1/1942	90	June
158	D. LANDRETH SEED CO., Bristol, Pa. World's Record, No. 468 Jose J. D'Aruda, Fall River	85 or Better	1/1942	94	April
822	Gradus Parker's Farm Supply Store, Danvers	—	—	94	June
480	MICHAEL-LEONARD SEED CO., Chicago, Ill. Telephone, No. 23021 Mutual Plumbing & Heating Co., Amherst	85+	12/1941	85	April
905	Gradus, No. 23922 Peirson Hardware Co., Pittsfield	90	12/1941	97	June
58	PERRY SEED CO., Boston, Mass. Laxton's Progress, No. 5727	—	—	96-1	April
790	JEROME B. RICE SEED CO., Cambridge, N. Y. Nott's Excelsior Kingston Hardware Co., Kingston	—	—	99	June
916	Laxton's Progress N. R. Wheeler, Richmond	85	12/1941	96	June
303	ROSS BROS. CO., Worcester, Mass. Alderman, No. 758	—	—	89	April
919	Telephone Arthur R. Baldwin, West Stockbridge	—	—	91	June
370	F. H. WOODRUFF & SONS, Milford, Conn. Gradus, No. 16005 Farm Service Co., Middleboro	96	12/1941	95	May
439	Thomas Laxton, No. 18762 Milford Hardware Co., Milford	—	12/1941	83	May
885	Nott's Excelsior Pittsfield Hardware & Plumbing Supply Co., Pittsfield	—	—	93	June

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
PEAS—Concluded					
296	S. D. WOODRUFF & SONS, Orange, Conn. Nott's Excelsior, No. 2198..... Worcester Grain & Coal Co., Worcester	-	—	81-3	April
737	Nott's Excelsior, No. 2192..... New Style Hardware Co., Roslindale	-	12/1941	93	June
758	World's Record, No. 2416..... Baker Hardware Co., Wellesley	80	1/1942	91	June
867	Little Gem, No. 1859..... John S. Glennon, Dalton	90	11/1937	72†(O)	June
868	Nott's Excelsior..... John S. Glennon, Dalton	90	1937	71‡(O)	June
540	UNKNOWN Telephone..... Carlisle Hardware Co., Springfield	-	—	93	May
869	Champion of England..... John S. Glennon, Dalton	-	—	72‡	June
996	Nott's..... Burlingame & Darbys Co., No. Adams	-	—	0†	June
PEPPER					
Standard Germination 55%					
171	COMSTOCK, FERRE & CO., Wethersfield, Conn. California Wonder..... W. G. Pearse & Co., Fall River	93	12/1941	92	April
579	CROSMAN SEED CORPORATION, East Rochester, N. Y. King of the North..... S. S. Kresge Co., Quincy	60	Packed for 1942	85	May
72	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Waltham Beauty, No. 8411..... Eastern States Farmers' Exchange, Waltham	80	12/1941	97	April
211	THOMAS W. EMERSON CO., Beverly, Mass. California, No. 1.....	-	—	89	April
494	FERRY-MORSE SEED CO., Detroit, Mich. Ruby King..... Carlisle Hardware Co., Springfield	-	—	58	April
94	HYGRADE SEED CO., INC., Fredonia, N. Y. California Wonder..... Franklin School, Holbrook	-	—	95	April
267	MICHAEL-LEONARD SEED CO., Chicago, Ill. Harris Early Giant, No. 57711..... Pierce Hardware Co., Taunton	60+	1/1942	48‡	April
599	Bell or Bull Nose..... Winer Bros., Inc., Beverly	-	—	29†	May
203	JOSEPH SORDILLO & SONS, Boston, Mass. Hot Squash.....	-	—	81	April

† Below Standard.

‡ Below Standard and below Guarantee.

(O) Old seed as shown by date of test.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Germination Date	Germination Found %	Month of Test 1942
PEPPER—Concluded					
435	F. H. WOODRUFF & SONS, Milford, Conn. Pimento..... Milford Hardware Co., Milford	-	—	59(c)	April
883	Long Red Cayenne..... Pittsfield Hardware & Plumbing Supply Co., Pittsfield	-	—	81	May
834	S. D. WOODRUFF & SONS, Orange, Conn. Bull Nose..... Adams Hardware & Paint Co., Lowell	-	—	93	May
PUMPKIN					
Standard Germination 75%					
827	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Conn. Field..... Essex County Cooperative Farming Asso- ciation, Danvers	90	9/1941	94	June
35	JOSEPH BRECK & SONS, Boston, Mass. Sweet or Sugar, No. C 386.....	-	—	96	April
874	CHARLES C. HART SEED CO., Wethersfield, Conn. Small Sugar..... Carr Hardware Co., Pittsfield	-	—	97	June
941	MICHAEL-LEONARD SEED CO., Chicago, Ill. Sugar or Pie, No. 61111..... Manchester Forbes Co., Easthampton	75+	1/1942	91	June
927	F. H. WOODRUFF & SONS, Milford, Conn. Approx. Conn. Field, No. 18896..... Platt & Goslee, Great Barrington	90	12/1941	95	June
RADISH					
Standard Germination 75%					
1076	W. ATLEE BURPEE CO., Philadelphia, Pa. Scarlet Globe..... Murry & Dugdale Co., Haverhill	-	—	80	June
31	JOSEPH BRECK & SONS, Boston, Mass. Scarlet Globe Short Top, No. C 247.....	-	—	90	April
761-e	CARMEL GIFT MAKERS, Carmel, Cal. Early Scarlet Globe..... R. H. White Co., Boston	-	—	98	May
804	COMSTOCK, FERRE & CO., Wethersfield, Conn. Early Scarlet Globe..... Plymouth Rock Hardware Co., Plymouth	-	—	96	May
1118	Early Scarlet Globe..... Bell Hardware Co., Stoneham	-	—	90	June
762-e	CROSMAN SEED CORPORATION, East Rochester, N. Y. Round Scarlet White Tipped..... S. S. Kresge Co., Boston	80	—	98	May
73	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Early Scarlet Globe, No. 19012..... Eastern States Farmers' Exchange, Waltham	95	12/1941	96	April

(c) Wholesaler claims seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Date	Germination Found %	Month of Test 1942
RADISH—Concluded					
221	THOMAS W. EMERSON CO., Beverly, Mass. Cavalier, No. 1	-	—	86	April
915	FREDONIA SEED CO., Fredonia, N. Y. Early Scarlet White Tip Richard Schinowsky, West Pittsfield	-	—	90	May
7	THOMAS J. GREY CO., Boston, Mass. Early Scarlet Globe	-	—	96	April
875	CHARLES C. HART SEED CO., Wethersfield, Conn. White Icicle Carr Hardware Co., Pittsfield	-	—	92	May
980	Black The Hardware Shop, Adams	-	—	75	June
991	French Breakfast Burlingame & Darbys Co., No. Adams	-	—	88	June
1084	BUDD D. HAWKINS, Reading, Vt. Early Scarlet Turnip Herman F. Davis, Merrimac	-	—	92	June
95	HYGRADE SEED CO., INC., Fredonia, N. Y. Early Scarlet Globe Franklin School, Holbrook	-	—	96	April
426	MICHAEL-LEONARD SEED CO., Chicago, Ill. Early Scarlet Globe W. E. Aubuchon Co., Inc., Holliston	-	—	45†	April
871	White Icicle John S. Glennon, Dalton	-	—	86	May
939	Early Scarlet Globe, No. 62722 Manchester Forbes Co., Easthampton	80 +	1/1942	91	June
922	THE PAGE SEED CO., Greene, N. Y. French Breakfast Snyder's Store, Hoosatonie	-	—	95	May
943	JEROME B. RICE SEED CO., Cambridge, N. Y. Early Scarlet Turnip White Top Bridge Market, Huntington	-	—	97	June
928	F. H. WOODRUFF & SONS, Milford, Conn. White Icicle Platt & Goslee, Great Barrington	Approx. 90	12/1941	96	May
957	Early Scarlet Globe E. A. Noble & Co., Stockbridge	Approx. 90	12/1941	95	June
1004	UNKNOWN French Breakfast Lev Hardware Co., No. Adams	-	—	28†	June

RUTABAGA

Standard Germination 75%

168F	ASSOCIATED SEED GROWERS, INC., New Haven, Conn. American Purple Top W. G. Pearse & Co., Fall River	-	12/1941	77	May
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† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's % Germination	Wholesaler's Date	Germination Found %	Month of Test 1942
RUTABAGA—Continued					
19F	JOSEPH BRECK & SONS, Boston, Mass. American Improved, No. C 230.....	-	—	97	May
22F	Sweet Perfection, No. C 366.....	-	—	80	May
150F	W. ATLEE BURPEE CO., Philadelphia, Pa. Improved American Purple Top Yellow..... Brownell Hardware Co., Attleboro	80	12/1941	91	May
45F	COMSTOCK, FERRE & CO., Wethersfield, Conn. Macomber—Improved White Rock..... A. E. Wordell, New Bedford	-	—	89	May
100F	American Purple Top..... F. Richmond & Co., Brockton	-	—	88	May
631F	Improved Purple Top Yellow..... Fred F. Smith, Inc., Reading	-	—	51†(c)	June
110F	CROSMAN SEED CORPORATION, East Rochester, N. Y. American Purple Top..... S. S. Kresge & Co., Brockton	85	—	76§	May
154F	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Long Island Neckless Purple Top, No. 2412... Eastern States Farmers' Exchange, Brockton	95	12/1941	99	May
155F	Macomber, No. 10811..... Eastern States Farmers' Exchange, Brockton	90	12/1941	98	May
210F	THOMAS W. EMERSON CO., Beverly, Mass. Macomber, No. 1.....	-	—	23†	May
349F	EMPIRE SEED CO., Fredonia, N. Y. American Purple Top..... Woodlawn Supply Co., So. Hadley	-	—	83	May
275F	FERRY-MORSE SEED CO., Detroit, Mich. American Purple Top..... Copeland Hardware Co., Taunton	-	—	94	May
492F	American Purple Top..... Carlisle Hardware Co., Springfield	-	—	64†(c)	May
654F	FREDONIA SEED CO., Fredonia, N. Y. Improved American Purple Top..... Bellingham Hardware Co., Weymouth	-	—	64†	June
5F	THOMAS J. GREY CO., Boston, Mass. Long Island Purple Top.....	-	—	62†	May
180F	JOSEPH HARRIS CO., INC., Rochester, N. Y. Improved Long Orange, No. 598..... Joseph Harris Co., Inc., Cambridge	96	—	94	May
116F	CHARLES C. HART SEED CO., Wethersfield, Conn. Macomber..... Pierce Hardware Co., Taunton	85	12/1941	98	May
121F	Long Island Improved Neckless..... Pierce Hardware Co., Taunton	82	1/1942	82	May
512F	American Purple Top Yellow..... Waite's Hardware Co., Southbridge	-	—	64†	May

† Below Standard.

§ Above Standard but below Guarantee.

(c) Wholesaler claims this seed not sold by him, at least not during current year.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Germination Date	Germination Found %	Month of Test 1942
RUTABAGA—Concluded					
994	CHARLES C. HART SEED CO.—Continued Long Island Yellow Burlingame & Darbys Co., No. Adams	-	—	98	June
1079	BUDD D. HAWKINS, Reading, Vt. Improved Purple Top Yellow Hardy Swede . . . Herman F. Davis, Merrimac	-	—	82	June
558F	D. LANDRETH SEED CO., Bristol, Pa. Landreth's Improved Yellow Fleshed Purple Top Frank E. Whitecomb, Amherst	-	—	96	May
745F	LITTLE TREE FARMS, Framingham Center, Mass. American Purple Top	-	—	99	May
257F	MICHAEL-LEONARD SEED CO., Chicago, Ill. Improved American Purple Top, No. 84592 . . . Pierce Hardware Co., Taunton	80+	1/1942	88	April
474F	Improved American Purple Top W. E. Aubuchon Co., Inc., Amherst	-	—	62†	April
17F	NORTHRUP, KING & CO., Minneapolis, Minn. American Purple Top F. W. Woolworth Co., Boston	-	—	71†	May
164F	THE PAGE SEED CO., Greene, N. Y. Macomber Y17,6141 Antonio M. Pires, Fall River	78	12/1941	40‡	May
51F	THE PERRY SEED CO., Boston, Mass. Improved American Purple Top, No. 7135	-	—	90	May
80F	JEROME B. RICE SEED CO., Cambridge, N. Y. Improved American Purple Top Middlesex County Farm Bureau Assoc., Weymouth	80	12/1941	88	May
133F	J. B. RICE, JR., INC., Shushan, N. Y. Yellow Purple Top John M. Fitzgerald Co., Taunton	Approx. 70	11/1941	83	May
302F	ROSS BROS. CO., Worcester, Mass. Long Island Improved #311	-	—	88	May
125F	F. H. WOODRUFF & SONS, Milford, Conn. Macomber, No. 7669 Waldron Hardware Co., Taunton	Approx. 89	11/1941	90	May
190F	Long Island Improved 9-332 Middlesex County Farm Bureau Assoc., Waltham	Approx. 90	12/1941	99	May
1065	American Purple Top, No. 18884 Haverhill Hardware & Plumbing Supply Co., Inc., Haverhill	95	1/1942	98	June
238F	S. D. WOODRUFF & SONS, Orange, Conn. White Rock, No. 2319R Monroe's Seed Market, Attleboro	80	1/1942	88	April
239F	Macomber, No. 2319 Monroe's Seed Market, Attleboro	80	1/1942	84	April
1001	UNKNOWN Yellow Lev Hardware Co., No. Adams	-	—	4†	June

† Below Standard.

‡ Below Standard and below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
SALSIFY					
Standard Germination 75%					
954	EMPIRE SEED CO., Fredonia, N. Y. Mammoth Sandwich Island H. C. Puffer Co., Huntington	-	-	78	June
1159	BUDD D. HAWKINS, Reading, Vt. Mammoth Sandwich Island Bengston Hardware Co., Gardner	-	-	0†	June
SPINACH					
Standard Germination:					
Common 60%					
482	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Bloomsdale Savoy Checkerboard Feed Store, Amherst	-	-	87	April
32	JOSEPH BRECK & SONS, Boston, Mass. Long Standing Bloomsdale, No. C 283	-	-	84	April
761-i	CARMEL GIFT MAKERS, Carmel, Cal. Tendergreen R. H. White Co., Boston	-	-	98	May
1117	COMSTOCK, FERRE & CO., Wethersfield, Conn. Giant Thick Leaf Bell Hardware Co., Stoneham	-	-	32†	June
762-d	CROSMAN SEED CORPORATION, East Rochester, N. Y. Bloomsdale S. S. Kresge Co., Boston	70	-	74	May
217	THOMAS W. EMERSON CO., Beverly, Mass. Old Dominion	-	-	89	April
346	CHARLES C. HART SEED CO., Wethersfield, Conn. New Long Standing Bloomsdale J. Russell & Co., Holyoke	-	-	82	April
1083	BUDD D. HAWKINS, Reading, Vt. Am. Savoy Leaved or Long Standing Herman F. Davis, Merrimac	-	-	79	June
821	D. LANDRETH SEED CO., Bristol, Pa. Bloomsdale Reselected D.G. Parker's Farm Supply Store, Danvers	70	-	93	May
259	MICHAEL-LEONARD SEED CO., Chicago, Ill. Short Leaved Bloomsdale Wilt Resistant, No. 68721 Pierce Hardware Co., Taunton	80+	1/1942	92	April
479	Savoy Leaved Bloomsdale Wilt Resistant, No. 68794 Mutual Plumbing & Heating Co., Amherst	87	1/1942	87	April
1093	Giant Noble Thick Leaf, 67821 F. B. Keene, Amesbury	65+	1/1942	68	June
527	THE PAGE SEED CO., Greene, N. Y. Bloomsdale Savoy, No. V 1040 Gatzke Hardware Co., Webster	Approx. 75	12/1941	73	April

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
SPINACH—Concluded					
444	GEORGE R. PEDRICK & SON, Pedricktown, N. J. Giant Thick Leaved, The Continental Nurseries, Franklin	70	3/1942	75	April
193	F. H. WOODRUFF & SONS, Milford, Conn. Bloomsdale Savoy Reselected, No. 18597, Middlesex County Farm Bureau Assoc., Waltham	Approx. 77	12/1941	49†	April
749	Round Thick Leaf, No. 18782, Boston Supply Co., Inc., Framingham	78	12/1941	70	June
813	Bloomsdale Long Standing, No. 14590, Danvers Hardware Co., Danvers	Below Stand. Approx. 40	12/1941	29†	May
815	Round Thick Leaf, 18224, Danvers Hardware Co., Danvers	-	—	68	May
817	Bloomsdale Long Standing Savoy, No. 14590, Danvers Hardware Co., Danvers	-	—	37†	May
930	Harlem Market, Platt & Goslee, Great Barrington	Approx. 95	12/1941	95	May
548	S. D. WOODRUFF & SONS, Orange, Conn. Long Standing Savoy, No. 2347, H. J. Croteau, Northampton	87	2/1942	73§	April
814	Long Standing Savoy, No. 1746, Danvers Hardware Company, Danvers	Approx. 76	1/1940	62§	May
SQUASH					
Standard Germination 75%					
ASSOCIATED SEED GROWERS, INC., Milford, Conn.					
823	Blue Hubbard, Essex County Cooperative Farming Association, Danvers	-	—	83	June
889	Improved Green Hubbard, Frank Howard, Inc., Pittsfield	-	—	98	June
JOSEPH BRECK & SONS, Boston, Mass.					
27	Blue Hubbard, No. C 217,	-	—	99	April
W. ATLEE BURPEE CO., Philadelphia, Pa.					
311	Giant Golden Summer, No. 1020, S. Allen's Sons, Greenfield	-	—	76	April
COMSTOCK, FERRE & CO., Wethersfield, Conn.					
242	Golden Summer Crookneck, Lawson Paint & Seed Co., Brockton	-	—	94	April
THOMAS W. EMERSON CO., Beverly, Mass.					
218	Blue Hubbard, No. 1,	-	—	90	April
651	Giant Summer Crookneck, Bellingham Hardware Co., Weymouth	-	—	9†	June
FERRY-MORSE SEED CO., Detroit, Mich.					
498	Giant Summer Straight Neck, Carlisle Hardware Co., Springfield	-	—	87	April

† Below Standard.

‡ Below Standard and below Guarantee.

§ Above Standard but below Guarantee.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
SQUASH—Concluded					
406	MICHAEL-LEONARD SEED CO., Chicago, Ill. Crookneck, No. 70127..... W. E. Aubuchon Co., Inc., Milford	80	1/1942	96	April
909	Leonard's Giant Straightneck, No. 70721..... Peirson Hardware Co., Pittsfield	80+	1/1942	94	June
59	PERRY SEED CO., Boston, Mass. Giant Summer Straight Neck, No. 6343.....	-	—	98	April
986	JEROME B. RICE SEED CO., Cambridge, N. Y. Giant Summer Crookneck..... Phillips General Store, Williamstown	-	—	87	June
194	F. H. WOODRUFF & SONS, Milford, Conn. Approx. Conn. Straight Neck, No. 1-140..... Middlesex County Farm Bureau Assoc., Waltham	88	12/1941	91	April
553	Special Blue Hubbard..... H. J. Croteau, Northampton	-	—	99	May
998	UNKNOWN Giant Summer Crookneck..... Lev Hardware Co., No. Adams	-	—	29†	June
TOMATO					
Standard Germination 75%					
890	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Certified Rutgers, No. 18..... Frank Howard, Inc., Pittsfield	90	11/1941	95	June
34	JOSEPH BRECK & SONS, Boston, Mass. Marglobe, No. C 158.....	-	—	91	April
411	Stone, No. 0220 F..... Economy Hardware Co., Milford	-	—	84	April
761-c	CARMEL GIFT MAKERS, Carmel, Cal. Marglobe Wilt, Rust Resistant..... R. H. White Co., Boston	-	—	92	June
826	COMSTOCK, FERRE & CO., Wethersfield, Conn. Bonny Best..... Essex County Cooperative Farming Association, Topsfield	-	—	77	May
286	CROSMAN SEED CORPORATION, East Rochester, N. Y. Dwarf Stone..... Weisner Bros., Inc., Boston	80	1942	98	April
74	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Marglobe, No. 2016..... Eastern States Farmers' Exchange, Waltham	90	12/1941	94	April
212	THOMAS W. EMERSON CO., Beverly, Mass. Marglobe, No. 1.....	-	—	92	April
1046	John Baer, No. 1..... Thompson Hardware Co., Lowell	-	—	92	June
277	FERRY-MORSE SEED CO., Detroit, Mich. Dwarf Champion..... Copeland Hardware Co., Taunton	-	—	75	April

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
TOMATO—Concluded					
858	FRASER'S, Wellesley, Mass. Master Marglobe.....	Approx. 85	1942	92	May
6	THOMAS J. GREY CO., Boston, Mass. Rutgers.....	-	—	96	April
333	CHARLES C. HART SEED CO., Wethersfield, Conn. Bonny Best.....	-	—	85	April
338	Federal Supply Co., Northampton John Baer.....	-	—	90	April
1080	Federal Supply Co., Northampton BUDD D. HAWKINS, Reading, Vt. Budd's Selected Spark's Earliana.....	-	—	75	June
139	Herman F. Davis, Merrimac HYGRADE SEED CO., INC., Fredonia, N. Y. Marglobe.....	-	—	88	April
588	Allen School, East Bridgewater D. LANDRETH SEED CO., Bristol, Pa. Bonny Best.....	-	—	82	May
777	Salem Hardware Co., Inc., Salem Bonny Best.....	-	—	83	May
940	Essex Hardware & Plumbing Supply Co., Lawrence MICHAEL-LEONARD SEED CO., Chicago, Ill. Earliana, No. 76521.....	80+	1/1942	95	June
166	Manchester Forbes Co., Easthampton THE PAGE SEED CO., Greene, N. Y. Bonny Best, No. X3-4-140.....	Approx. 81	11/1941	88	April
53	Antonio M. Pires, Fall River PERRY SEED CO., Boston, Mass. Bonny Best, No. 6916.....	-	—	91	April
138	J. B. RICE, JR., INC., Shushan, N. Y. Earliana.....	Approx. 68	11/1941	75	April
880	John M. Fitzgerald Co., Taunton F. H. WOODRUFF & SONS, Milford, Conn. Earliana.....	-	—	76	June
241	Pittsfield Hardware & Plumbing Supply Co., Pittsfield S. D. WOODRUFF & SONS, Orange, Conn. Marglobe, No. 1949.....	77	12/1941	80	April
837	Monroe's Seed Market, Attleboro Bonnie Best, No. 2344.....	85	1/1942	86	May
	Adams Hardware & Paint Co., Lowell				

TURNIP

Standard Germination 80%

169F	ASSOCIATED SEED GROWERS, INC., Milford, Conn. Purple Top White Globe.....	90	10/1941	97	May
314F	W. G. Pearse & Co., Fall River Purple Top Strap Leaved.....	90	10/1941	94	May
104F	Clark Hardware Co., Greenfield W. ATLEE BURPEE CO., Philadelphia, Pa. Purple Top White Globe.....	-	—	98	May
	F. Richmond & Co., Brockton				

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Continued

VEGETABLES—Continued

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Germination Date	Germination Found %	Month of Test 1942
TURNIP—Continued					
1075	W. ATLEE BURPEE CO.—Continued Purple Top Strap Leaf, No. 1157 Murray & Dugdale Co., Haverhill	-	—	95	June
761-j	CARMEL GIFT MAKERS, Carmel, Cal. Early Purple Top White R. H. White Co., Boston	-	—	97	June
44F	COMSTOCK, FERRE & CO., Wethersfield, Conn. Purple Top Strap Leaf Flat A. E. Wordell, New Bedford	-	—	98	May
113F	Purple Top Flat Frank P. Mills, Campello	-	—	97	May
226F	Yellow Stone Franklin Hardware Co., No. Attleboro	95	12/1941	98	May
109F	CROSMAN SEED CORPORATION, East Rochester, N. Y. Purple Top White Globe S. S. Kresge Co., Brockton	80	—	94	May
762-g	Purple Top White Globe S. S. Kresge Co., Boston	-	—	88	May
152F	EASTERN STATES FARMERS' EXCHANGE, Springfield, Mass. Purple Top White Globe, No. 11011 Eastern States Farmers' Exchange, Brockton	90	12/1941	99	May
153F	Amber Globe, No. 612 Eastern States Farmers' Exchange, Brockton	90	12/1941	97	May
209F	THOMAS W. EMERSON CO., Beverly, Mass. Purple Top White Globe	-	—	87	May
274F	FERRY-MORSE SEED CO., Detroit, Mich. White Egg Copeland Hardware Co., Taunton	-	—	97	May
491F	Orange Jelly or Golden Ball Carlisle Hardware Co., Springfield	-	—	66†	April
655F	FREDONIA SEED CO., Fredonia, N. Y. Purple Top White Globe Bellingham Hardware Co., Weymouth	-	—	75†	May
4F	THOMAS J. GREY CO., Boston, Mass. White Egg	-	—	91	May
181F	JOSEPH HARRIS CO., INC., Rochester, N. Y. Purple Top White Globe, No. 597 Joseph Harris Co., Inc., Cambridge	96	1942	93	May
107S	BUDD D. HAWKINS, Reading, Vt. New White Sweet German Herman F. Davis, Merrimac	-	—	37†	June
557F	D. LANDRETH SEED CO., Bristol, Pa. Large Early Red or Purple Top White Globe Frank L. Whitecomb, Amherst	-	—	90	May
1022	Early Flat Red or Purple Top Strap Leaf City Grain Co., Marlboro	85	1/1942	93	June

† Below Standard.

1942 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS—Concluded

VEGETABLES—Concluded

Lab. No.	Wholesale Distributor, Kind of Seed and Variety, Dealer When Other Than Wholesale Distributor, and Place Collected	Wholesaler's Germination %	Wholesaler's Date	Germination Found %	Month of Test 1942
TURNIP—Concluded					
255F	MICHAEL-LEONARD SEED CO., Chicago, Ill. White Egg, No. 834-12 Pierce Hardware Co., Taunton	80	1/1942	97	April
256F	Purple Top Strap Leaf, No. 82111 Pierce Hardware Co., Taunton	80	1/1942	96	April
16F	NORTHRUP, KING & CO., Minneapolis, Minn. Purple Top White Globe F. W. Woolworth & Co., Boston	—	—	80	May
163F	THE PAGE SEED CO., Greene, N. Y. Purple Top Strap Leaf, No. Y2-7442 Antonio M. Pires, Fall River	90	12/1941	98	May
526F	White Egg, No. Y 10-4836 Gatzke Hardware Co., Webster	90	12/1941	95	May
442F	GEORGE R. PEDRICK & SONS, Pedricktown, N. J. Strap Leaf The Continental Nurseries, Franklin	90	1/1942	96	May
52F	PERRY SEED CO., Boston, Mass. Purple Top White Globe, No. 7056	—	—	97	May
301F	ROSS BROS. CO., Worcester, Mass. Purple Top White Globe, No. 634	—	—	95	May
79F	JEROME B. RICE SEED CO., Cambridge, N. Y. Purple Top White Globe Middlesex County Farm Bureau Assoc., Weymouth	80	12/1941	91	May
134F	J. B. RICE, JR., INC., Shushan, N. Y. Purple Top White Globe John M. Fitzgerald Co., Taunton	Approx. 85	11/1941	97	May
91F	STERLING SEED CO., Minneapolis, Minn. Purple Top White Globe W. T. Grant Co., Boston	—	—	83	May
126F	F. H. WOODRUFF & SONS, Milford, Conn. Seven Top, No. 9-16 Waldron Hardware Co., Taunton	90	12/1941	91	May
198F	Purple Top White Globe, No. 1-179 Middlesex County Farm Bureau Assoc., Waltham	Approx. 90	12/1941	98	May
368F	Purple Top White Globe, No. 184554 Farm Service Co., Middleboro	Approx. 90	12/1941	97	May
122F	S. D. WOODRUFF & SONS, Orange, Conn. Seven Top, No. 2405 Pierce Hardware Co., Taunton	80	1/1942	88	May
236F	Purple Top Strap Leaf, No. 2351 Monroe's Seed Market, Attleboro	85	1/1942	58‡	April
237F	White Egg, No. 2385 Monroe's Seed Market, Attleboro	80	1/1942	73‡	April

‡ Below Standard and below Guarantee.

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted in Conjunction with the Department of Olericulture,

Grant B. Snyder, Professor

Each year tests are conducted by the Experiment Station to determine the trueness to type of vegetable seeds which are offered for sale by the seedsmen in this State. Samples of seed of beets, carrots, turnips, and rutabagas were obtained by State Inspectors and sent to the Massachusetts Agricultural Experiment Station at Amherst, where the Department of Olericulture sowed the seed in field test plots in order to compare plant characteristics with the labeled variety name.

The soil of the test plot is a fine, sandy loam and is naturally fertile. The land was well prepared and a liberal quantity of fertilizer was applied broadcast. Frequent and timely rains provided an excellent growing season so that growth and development were generally satisfactory.

Yield records were not taken because it was necessary to use small plots and the number of samples in the test made replication almost impossible. Conformity to "type" has been the measure of comparison in these tests. "Type" in plants deals with many characteristics such as shape of the marketable part of the plant; relative smoothness, tallness, or dwarfness; different colors of flowers, fruits, or seeds; disease resistance or susceptibility; and many other well defined differences.

Individual plants have been called "off-type" when they could not be classified in a group of plants ranging fairly close to the average for the particular strain or variety under consideration.

In studying the comparative type characters and performance records, it is plainly evident that practically all the stocks were true to name and description and most of them were highly productive. In a few instances it appeared as though a slight mixture had occurred, but in no case was it plainly evident that the variety had been misnamed or misrepresented.

The source of the seed and the laboratory germination records are to be found in the tables on pages 33-75, where the lots of seed used in the field tests are identified by the letter "F" added to the laboratory number. Those seeds tested in the field and not included in the following table were found 100% true to type.

FIELD TESTS OF VEGETABLE SEEDS

Lab. No.	Kind of Seed and Variety	True to Type Percent	Remarks
BEETS			
88 F	Early Blood Turnip.....	92	6% top shape — 2% globular
129 F	Early Blood Turnip.....	94	4% light color — 2% globular
348 F	Early Blood Turnip.....	94	4% light color — 2% very flat
115 F	Early Wonder.....	98	2% long top
156 F	Early Wonder, No. 1-223.....	92	4% globular — 4% top shape
161 F	Early Wonder, No. D 20-4839.....	96	4% light color
174 F	Early Wonder.....	90	2% oval — 6% globular — 2% top shape
207 F	Early Wonder.....	98	2% globular
224 F	Early Wonder.....	96	4% long top shape
231 F	Early Wonder, No. 2168.....	90	6% light color — 2% long — 2% globular
285 F	Early Wonder.....	96	4% top shape
653 F	Early Eclipse.....	94	2% spindle shape — 4% long top
467 F	Early Red Chief, No. 1-318.....	92	8% long top
288 F	Egyptian Early.....	94	6% globular
382 F	Egyptian, Early Dark.....	96	4% long top
21 F	Edmand's Blood Turnip, No. C-120.....	94	6% light color
374 F	Edmand's Blood Turnip.....	98	2% globular
111 F	Edmand's Early Blood.....	92	4% light color — 4% long top
230 F	Boston Crosby No. 4025.....	98	2% globular
63 F	Crosby's Early Wonder, No. 312.....	98	2% top shape
1 F	Crosby's Egyptian.....	92	2% light color — 6% top shape
77 F	Crosby's Egyptian.....	88	6% light color — 2% very flat — 4% globular
86 F	Crosby's Egyptian, No. C 317.....	96	4% oval — top shaped
93 F	Crosby's Egyptian.....	86	8% globular — 4% top shaped — 2% long top
106 F	Crosby's Egyptian.....	84	4% light color — 8% globular — 4% top shape
127 F	Crosby's Egyptian, No. 18384.....	96	4% globular
176 F	Crosby's Egyptian, No. 446.....	90	6% globular — 2% long — 2% oval
189 F	Crosby's Egyptian, No. 18354.....	86	8% light color — 4% globular — 2% ovate
258 F	Crosby's Egyptian, No. 28371.....	86	14% top shape
306 F	Crosby's Egyptian.....	82	16% long top — 2% globular
344 F	Crosby's Egyptian.....	92	8% long top
361 F	Crosby's Egyptian.....	98	2% globular
465 F	Crosby's Egyptian.....	96	4% long top
528 F	Crosby's Egyptian.....	96	4% long top
832 F	Crosby's Egyptian, No. 2288.....	92	6% globular — 2% long top
81 F	Crosby's Improved Egyptian, No. 1143.....	90	2% light color — 4% globular — 4% spindle
40 F	Detroit Dark Red.....	94	6% long type
43 F	Detroit Dark Red.....	96	2% flat — 2% long top
102 F	Detroit Dark Red.....	88	4% obovate — 4% flat — 4% long type
114 F	Detroit Dark Red.....	92	6% flat — 2% obovate
151 F	Detroit Dark Red, No. 612.....	78	8% flat — 14% top shape
170 F	Detroit Dark Red.....	90	2% flat — 8% top shape
188 F	Detroit Dark Red, No. 18395.....	96	2% flat — 2% long top
229 F	Detroit Dark Red, No. 4025.....	96	4% flat
232 F	Detroit Dark Red, No. 2325.....	96	4% flat
246 F	Detroit Dark Red.....	92	4% flat — 4% long top
273 F	Detroit Dark Red, No. 66223.....	94	4% long top — 2% flat
289 F	Detroit Dark Red.....	96	2% cylindrical — 2% flat
300 F	Detroit Dark Red, No. 731.....	90	2% light color — 8% flat
317 F	Detroit Dark Red.....	96	4% flat

FIELD TESTS OF VEGETABLE SEEDS—Continued

Lab. No.	Kind of Seed and Variety	True to Type Percent	Remarks
BEETS — Concluded			
523 F	Detroit Dark Red	96	2% long — 2% flat
405 F	Dark Red Egyptian	92	8% long top
471 F	Dark Red Egyptian	88	2% light color — 8% long top — 2% oval
477 F	Improved Dark Red	90	4% long top — 6% flat
199 F	Large Blood	90	8% top shape — 2% light color
423 F	Leonard's Dark Red Egyptian	92	8% long top
128 F	Woodruff's Early Wonder, No. 2219	96	4% top shape
CARROTS			
14 F	Chantenay	94	2% cylindrical — 4% tapering
20 F	Chantenay, No. C-145	96	4% long tapering
76 F	Chantenay	90	10% long tapering
89 F	Chantenay	98	2% long tapering
92 F	Chantenay	94	4% cylindrical — 2% long tapering
103 F	Chantenay	92	6% cylindrical — 2% tapering
254 F	Chantenay	96	4% tapering
290 F	Chantenay, No. 250	94	6% long tapering
297 F	Chantenay	90	10% tapering
307 F	Chantenay	96	4% tapering
347 F	Chantenay	92	8% tapering
433 F	Chantenay	96	4% tapering
493 F	Chantenay	92	8% tapering
613 F	Chantenay	80	20% long tapering
645 F	Chantenay, Early	94	6% long tapering
402 F	Danvers	92	2% light colored — 6% stump rooted
412 F	Danvers	96	4% stump rooted
418 F	Danvers	94	6% stump rooted
48 F	Danvers Half Long	96	4% very broad shoulders
107 F	Danvers Half Long	96	4% stump rooted
118 F	Danvers Half Long-Stump root	94	6% tapering root
124 F	Danvers Half Long	96	4% stump rooted
131 F	Danvers Half Long	80	20% cylindrical
157 F	Danvers Half Long, No. 13326	90	2% light colored — 8% stump rooted
234 F	Danvers Half Long	94	2% light colored — 4% stump rooted
245 F	Danvers Half Long	94	6% stump rooted
252 F	Danvers Half Long	98	2% stump rooted
308 F	Danvers Half Long	86	10% stump rooted — 4% cylindrical
312 F	Danvers Half Long	92	2% light colored — 6% stump rooted
324 F	Danvers Half Long	80	20% stump rooted
365 F	Danvers Half Long	92	8% stump rooted
367 F	Danvers Half Long	92	2% light colored — 4% cylindrical — 2% stump
384 F	Danvers Half Long	92	8% stump rooted
392 F	Danvers Half Long	88	12% stump rooted
466 F	Danvers Half Long, No. 8020	98	2% yellow roots
546 F	Danvers Half Long	90	10% stump rooted
562 F	Danvers Half Long	92	8% stump rooted
816 F	Danvers Half Long	98	2% stump rooted
2 F	Early French Forcing	98	2% tapering
49 F	Hutchinson, No. 2150	92	6% very stump rooted — 2% very bulbous tapering
62 F	Hutchinson, No. 14512	94	2% light — 2% stump rooted — 2% oval

FIELD TESTS OF VEGETABLE SEEDS—Concluded

Lab. No.	Kind of Seed and Variety	True to Type Percent	Remarks
CARROT—Concluded			
187 F	Hutchinson	98	2% cylindrical
233 F	Hutchinson	96	4% cylindrical
298 F	Hutchinson	90	8% stump rooted — 2% cylindrical
322 F	Hutchinson	94	6% stump rooted
326 F	Hutchinson	98	2% cylindrical
331 F	Hutchinson	94	6% light colored
372 F	Hutchinson	88	4% cylindrical — 2% light colored — 6% stump rooted
440 F	Hutchinson	98	2% cylindrical
550 F	Hutchinson	96	4% white roots
167 F	Imperator	94	6% very stump rooted
284 F	Imperator	94	4% cylindrical — 2% stump rooted
130 F	Improved Long Orange	94	4% light colored — 2% stump rooted
409 F	Improved Long Orange	96	2% light colored — 2% stump rooted
RUTABAGA			
110 F	American Purple Top	94	2% Turnip — 4% neckless
180 F	*American Purple Top, No. 598	90	10% long top shape
349 F	American Purple Top	98	2% Turnip
512 F	American Purple Top, yellow	98	2% white flesh
51 F	Improved American Purple Top, No. 7135	92	8% long oval
257 F	Improved American Purple Top, No. 84592	98	2% Turnip
558 F	Landreth's Improved Yellow Fleshed Purple Top	90	10% long top shaped
116 F	Macomber	98	2% long neck
164 F	Macomber, No. Y 17.6141	98	2% purple top
TURNIP			
655 F	Purple Top White Globe	88	4% flat — 8% long top
16 F	Purple Top White Globe	92	8% long top
52 F	Purple Top White Globe, No. 7056	92	8% long top
79 F	Purple Top White Globe	96	4% white
91 F	Purple Top White Globe	88	4% white — 8% long top
104 F	Purple Top White Globe	96	4% long top
109 F	Purple Top White Globe	92	8% long top
134 F	Purple Top White Globe	92	8% flat
152 F	Purple Top White Globe, No. 11011	96	4% long top
169 F	Purple Top White Globe	92	8% long top shape
181 F	Purple Top White Globe, No. 597	92	4% flat — 4% long top
198 F	Purple Top White Globe, No. 1-179	84	16% long top
209 F	Purple Top White Globe	96	4% long top
301 F	Purple Top White Globe, No. 634	92	8% long top
368 F	Purple Top White Globe, No. 184554	92	8% long top
557 F	Purple Top White Globe, Large Ea. Red	88	4% white — 4% flat — 4% long top
113 F	Purple Top Flat	96	4% white
44 F	Purple Top Strap Leaf	80	16% globe shaped — 4% white
163 F	Purple Top Strap Leaf, No. Y2-7442	88	8% white — 4% long top
236 F	Purple Top Strap Leaf, No. 2351	92	8% globe
256 F	Purple Top Strap Leaf, No. 82111	96	4% long top
442 F	Strap Leaf	88	8% white — 4% long top
4 F	White Egg	88	12% long top
255 F	White Egg, No. 834-12	92	8% long top
274 F	White Egg	88	12% long top

* This was labeled "Improved Long Orange" but was found to be "American Purple Top."

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor

For the seventh season the Department of Floriculture has cooperated with the Seed Laboratory in maintaining trials to determine the quality of flower seed offered for sale in retail seed stores, hardware stores, chain stores, schools, and other retail outlets. The seeds, which were collected by the State Seed Inspector, were tested for germination and performance under field conditions.

Seeds of 233 lots, representing 54 genera, packeted by 20 concerns, and obtained from 68 retailers, were distributed as follows:

Ageratum	4	Kochia	5
Alyssum	7	Linum	2
Anchusa	2	Lobelia	1
Antirrhinum	3	Lupinus	1
Aretotis	1	Mathiola	3
Brachycome	1	Mirabilis	3
Calendula	9	Nemesia	1
Callistephus	8	Nemophila	2
Celosia	3	Nierembergia	1
Centaurea	6	Nigella	4
Chrysanthemum	3	Papaver	7
Clarkia	2	Petunia	15
Cleome	1	Phacelia	1
Cosmos	11	Phlox	2
Cynoglossum	1	Portulaca	6
Delphinium	7	Reseda	3
Dianthus	3	Rudbeckia	1
Didiscus	2	Salpiglossis	3
Dimorphotheca	1	Salvia	2
Eschscholtzia	3	Scabiosa	7
Gaillardia	4	Schizanthus	1
Gamolepis	1	Tagetes	16
Gypsophila	5	Tropaeolum	9
Helianthus	1	Venidium	1
Helichrysum	2	Verbena	9
Iberis	4	Zinnia	21
Impatiens	4		
Ipomoea	7	TOTAL	233

Germination tests were not made in the laboratory on any of the lots of seed. Where the number of seeds permitted, rows twelve feet in length were sown, but in many lots the number was insufficient. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, producing only a low percentage of plants which were not true to form or color (one-third or less); "fair" between one-third and two-thirds not true; and "not satisfactory," if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. However, since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

All seeds were sown on June 22. The first killing frost occurred on September 29. Total rainfall for the months of June, July, August, and September in 1942 was 15.45 inches, as compared with 14.84 inches in 1941, 10.24 inches in 1940, 12.73 inches in 1939, and 32.49 inches in 1938.¹

Results of the tests on germination are summarized as follows:

	NUMBER OF LOTS	PERCENT OF TOTAL
Good	104	45
Fair	54	23
Poor	70	30
None	5	2
	—	—
Total	233	100

¹Data on precipitation and frost were taken from the monthly bulletins, "Meteorological Observations" of the Massachusetts Agricultural Experiment Station.

FLOWER SEED INSPECTION

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
AGERATUM			
624F	FERRY-MORSE SEED CO., Detroit, Mich. Blue Teddy's Wall Paper & Paint Shop, Jamaica Plain	Good	Satisfactory
445F	THOMAS J. GREY CO., Boston, Mass. Dwarf Blue Bedder	Good	Satisfactory
769F	CHARLES C. HART SEED CO., Wethersfield, Conn. Blue Perfection Dean Hardware Co., Lawrence	Good	Satisfactory
1067F	STERLING SEED CO., Minneapolis, Minn. Dwarf Blue F. & W. Grand Silver Stores, Haverhill	Poor	Not Satisfactory
ALYSSUM			
630F	JOSEPH BRECK & SONS, Boston, Mass. Sweet Guy L. Harvey Hardware Stores, Inc., Jamaica Plain	Good	Satisfactory
677F	White Fleece Joseph Breck & Sons, Boston	Good	Satisfactory
959F	FREDONIA SEED CO., Fredonia, N. Y. Little Gem E. A. Noble & Co., Stockbridge	Poor	Not Satisfactory
959-aF	Bentham's Sweet	Fair	Satisfactory
668F	MANDEVILLE & KING CO., Rochester, N. Y. Snow Cloth Buzzard's Bay Hardware Co., Buzzard's Bay	Good	Satisfactory
671F	PAGE SEED CO., Greene, N. Y. White Onset Lumber Co., Onset	Good	Satisfactory
278F	PERRY SEED CO., Boston, Mass. Violet Queen	Fair	Satisfactory
ANCHUSA			
798F	W. ATLEE BURPEE CO., Philadelphia, Pa. Blue Bird John E. Jordan Co., Plymouth	Good	Satisfactory
891F	JEROME B. RICE SEED CO., Cambridge, N. Y. Blue Bird Frank Howard, Inc., Pittsfield	Poor	Not Satisfactory
ANTIRRHINUM — Snapdragon			
1072F	W. ATLEE BURPEE CO., Philadelphia, Pa. Giant Mixed Murray & Dugdale Co., Haverhill	Fair	Satisfactory
446F	THOMAS J. GREY CO., Boston, Mass. Reveille — Tall Giant Yellow	Fair	Not Satisfactory 4 colors
990F	MANDEVILLE & KING CO., Rochester, N. Y. All Colors Phillips General Store, Williamstown	Poor	Not Satisfactory
ARCTOTIS			
741F	LITTLE TREE FARMS, Framingham Center, Mass. Hybrids, Mixed Colors	Poor	Not Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
BRACHYCOME — Swan River Daisy			
CROSMAN SEED CORPORATION, Rochester, N. Y.			
711-cF	Swan River Daisy..... S. S. Kresge Co., Boston	Good	Satisfactory
CALENDULA			
W. ATLEE BURPEE CO., Philadelphia, Pa.			
727F	Yellow Colossal..... The Fair, Roslindale	Fair	Satisfactory
GENESEE VALLEY SEED CO., Dalton, N. Y.			
707F	Campfire..... S. S. Kresge Co., Boston	Fair	Satisfactory
CHARLES C. HART SEED CO., Wethersfield, Conn.			
616F	Orange King..... Clarendon Hill Hardware Co., Inc., Somerville	Poor	Not Satisfactory
HYGRADE SEED CO., Fredonia, N. Y.			
99F	Exquisite Mixed Colors..... Franklin School, Holbrook	Good	Satisfactory
PAGE SEED CO., Greene, N. Y.			
637F	Orange King..... L. M. Johnson, Reading	Fair	Satisfactory
PERRY SEED CO., Boston, Mass.			
279F	Sensation or Campfire.....	Good	Satisfactory
ROSS BROS. CO., Worcester, Mass.			
860F	Ball's Gold.....	Good	Satisfactory
THORNTON & CROUCH, Lawrence, Mass.			
781F	Campfire.....	Fair	Satisfactory
VAUGHAN'S SEED STORE, Chicago, Ill.			
642F	Shaggy..... Harold Cogger, Reading	Poor	Not Satisfactory
CALLISTEPHUS — Aster			
COBURN SEED & SUPPLY CO., Chelmsford, Mass.			
1031F	Azure Blue.....	Good	Had not bloomed September 25
FERRY-MORSE SEED CO., Detroit, Mich.			
625F	Giant Crego Crimson..... Teddy's Wall Paper & Paint Shop, Jamaica Plain	Good	Satisfactory
GENESEE VALLEY SEED CO., Dalton, N. Y.			
708F	El Monte..... S. S. Kresge Co., Boston	Poor	Not Satisfactory
LITTLE TREE FARMS, Framingham Center, Mass.			
740F	Rose Marie.....	Good	Satisfactory
NORTHROP, KING & CO., Minneapolis, Minn.			
660F	Ostrich Plume Red..... F. W. Woolworth Co., Weymouth	Poor	Not Satisfactory
PAGE SEED CO., Greene, N. Y.			
672F	Ostrich Plume Mixed..... Onset Lumber Co., Onset	Good	Satisfactory
ROSS BROS. CO., Worcester, Mass.			
859F	Super Giant El Monte.....	Good	Had not bloomed September 25
STERLING SEED CO., Minneapolis, Minn.			
608F	Ostrich Plume Red..... J. J. Newberry Co., Woburn	Poor	Not Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
CELOSIA — Cockscomb			
797F	W. ATLEE BURPEE CO., Philadelphia, Pa. Plumosa Mixed John E. Jordan Co., Plymouth	Good	Satisfactory
914F	J. B. RICE, JR., INC., Shushan, N. Y. Feather Mixed Peirson Hardware Co., Pittsfield	Good	Satisfactory
861F	ROSS BROS. CO., Worcester, Mass. Glasgow Prize	Good	Satisfactory
CENTAUREA — (Including Bachelor's Button)			
678F	JOSEPH BRECK & SONS, Boston, Mass. Americana Rosy Lilac	Poor	Not Satisfactory
690F	FERRY-MORSE SEED CO., Detroit, Mich. Red Boy Jordan Marsh Co., Boston	Fair	Not Satisfactory Included blue forms
621F	CHARLES C. HART SEED CO., Wethersfield, Conn. Bachelor's Button — Double Blue Forest Strain Brigham Hardware Supply Co., Boston	Fair	Satisfactory
638F	PAGE SEED CO., Greene, N. Y. Finest Mixed L. M. Johnson, Reading	Poor	Not Satisfactory
988F	J. B. RICE, JR., INC., Shushan, N. Y. Double Blue Phillips General Store, Williamstown	Good	Satisfactory
712F	STERLING SEED CO., Minneapolis, Minn. Double Blue McLellan's Store, Boston	Fair	Satisfactory
CHRYSANTHEMUM			
849F	W. ATLEE BURPEE CO., Philadelphia, Pa. Annual, Single Mixed C. B. Coburn Co., Lowell	Poor	Not Satisfactory
894F	JEROME B. RICE SEED CO., Cambridge, N. Y. Coronarum, Mixed Frank Howard, Inc., Pittsfield	Good	Satisfactory
1068F	STERLING SEED CO., Minneapolis, Minn. Eastern Star F. & W. Grand Silver Stores, Haverhill	Fair	Satisfactory
CLARKIA			
691F	FERRY-MORSE SEED CO., Detroit, Mich. Double Salmon Jordan Marsh Co., Boston	Poor	Not Satisfactory
713F	STERLING SEED CO., Minneapolis, Minn. Double Mixed McLellan's Store, Boston	Poor	Not Satisfactory
CLEOME			
692F	FERRY-MORSE SEED CO., Detroit, Mich. Giant Rose Shades Jordan Marsh Co., Boston	Fair	Satisfactory
COSMOS			
595F	THOMAS W. EMERSON CO., Beverly, Mass. Orange Flare	Poor	Not Satisfactory
703-aF	GENESSE VALLEY SEED CO., Dalton, N. Y. Pink S. S. Kresge Co., Boston	Fair	Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
COSMOS—Concluded			
GENESSE VALLEY SEED CO.—Continued			
703-bF	Crimson S. S. Kresge Co., Boston	Poor	Not Satisfactory
703-cF	Rose S. S. Kresge Co., Boston	Poor	Not Satisfactory
703-dF	Best Mixed S. S. Kresge Co., Boston	Poor	Not Satisfactory 2 colors only
THOMAS J. GREY CO., Boston, Mass.			
447F	Yellow Flare Klondyke	Good	Satisfactory
HYGRADE SEED CO., Fredonia, N. Y.			
141F	Sensation Mixed Colors Allen School, East Bridgewater	Good	Satisfactory
PAGE SEED CO., Greene, N. Y.			
1106F	Orange Flare W. E. Fuller Co., Mansfield	Poor	Not Satisfactory
PERRY SEED CO., Boston, Mass.			
281F	Sensation Purity	Good	Satisfactory
J. B. RICE, JR., INC., Shushan, N. Y.			
913F	Orange Flare Peirson Hardware Co., Pittsfield	Poor	Not Satisfactory
JEROME B. RICE SEED CO., Cambridge, N. Y.			
944F	Sensation Bridge Market, Huntington	Good	Satisfactory
CYNOGLOSSUM			
W. ATLEE BURPEE CO., Philadelphia, Pa.			
728F	Blanche Burpee, Mixed Colors The Fair, Roslindale	Fair	Satisfactory
DELPHINIUM — Larkspur			
CROSMAN SEED CORPORATION, East Rochester, N. Y.			
721-aF	Lilac Spire S. S. Kresge Co., Jamaica Plain	Poor	Not Satisfactory
721-bF	Dark Blue Spire S. S. Kresge Co., Jamaica Plain	Fair	Satisfactory
721-cF	Empress Pink S. S. Kresge Co., Jamaica Plain	Poor	Not Satisfactory
1020F	Carmine King S. S. Kresge Co., Roxbury	Poor	Not Satisfactory
THOMAS W. EMERSON CO., Beverly, Mass.			
596F	Rosamond	None	
THOMAS J. GREY CO., Boston, Mass.			
448F	Empress Rose Bud	Poor	Not Satisfactory
NORTHRUP, KING & CO., Minneapolis, Minn.			
981F	Mixed Colors Arthur E. Sherman, Lanesboro	Poor	Not Satisfactory
DIANTHUS — Pinks			
JOSEPH BRECK & SONS, Boston, Mass.			
676F	Breck's Geisha Girl	Good	Satisfactory
FREDONIA SEED CO., Fredonia, N. Y.			
657F	Heddwigi Mixed Bellingham Hardware Co., Weymouth	Good	Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
DIANTHUS—Concluded			
675F	JEROME B. RICE SEED CO., Cambridge, N.Y. Annual, Mixed, Church & Stowell Co., Wareham	Good	Satisfactory
DIDISCUS — Blue Lace Flower			
853F	FRASER'S, Wellesley, Mass. Blue Lace Flower	Good	Satisfactory
779F	THORNTON & CROUCH, Lawrence, Mass. Blue Lace Flower	Good	Satisfactory
DIMORPHOTHECA — African Daisy			
711-aF	CROSMAN SEED CORPORATION, East Rochester, N. Y. African Daisy, S. S. Kresge Co., Boston	Poor	Not Satisfactory
ESCHSCHOLTZIA — California Poppy			
855F	FRASER'S, Wellesley, Mass. Brilliant Shades, Selected	Good	Satisfactory
696F	NORTHROP, KING & CO., Minneapolis, Minn. Golden Orange, F. W. Woolworth Co., Boston	Fair	Satisfactory
975	J. B. RICE, JR., INC., Shushan, N. Y. Mixed, Shaker's Store, Adams	Fair	Satisfactory
GAILLARDIA			
802F	W. ATLEE BURPEE CO., Philadelphia, Pa. Double Mixed, John E. Jordan Co., Plymouth	Poor	Not Satisfactory
854F	FRASER'S, Wellesley, Mass. Picta Single, Finest Mixed	Poor	Not Satisfactory
964F	MANDEVILLE & KING CO., Rochester, N. Y. Indian Chief, Berkshire Hardware Co., Pittsfield	Poor	Not Satisfactory
893F	JEROME B. RICE SEED CO., Cambridge, N.Y. Indian Chief, Frank Howard, Inc., Pittsfield	Fair	Satisfactory
GAMOLEPIS — Dahlborg Daisy			
679F	JOSEPH BRECK & SONS, Boston, Mass. Dahlborg Daisy	None	
GYPSOPHILA			
711-bF	CROSMAN SEED CORPORATION, East Rochester, N. Y. Baby's Breath, S. S. Kresge Co., Boston	Fair	Satisfactory
1090F	THOMAS W. EMERSON CO., Beverly, Mass. Rose Pink, J. B. Keene, Amesbury	Good	Not Satisfactory Weak strain; poor growth
617F	CHARLES C. HART SEED CO., Wethersfield, Conn. White, Clarendon Hill Hardware Co., Somerville	Fair	Satisfactory
862F	ROSS BROS. CO., Worcester, Mass. Elegans Grandiflora Alba	Good	Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
GYPSOPHILA—Concluded			
716F	STERLING SEED CO., Minneapolis, Minn. Annual White Paris Market..... McLellan's Store, Boston	Good	Satisfactory
HELIANTHUS — Sunflower			
942F	MICHAEL-LEONARD SEED CO., Chicago, Ill. Mammoth Russian..... Manchester Forbes Co., Easthampton	Good	Satisfactory
HELICHRYSUM — Everlasting			
623F	CHARLES C. HART SEED CO., Wethersfield, Conn. Mixed..... Brigham Hardware Supply Co., Boston	Poor	Not Satisfactory
1069F	STERLING SEED CO., Minneapolis, Minn. Monstrum Mixed..... F. & W. Grand Silver Stores, Haverhill	Poor	Not Satisfactory
IBERIS — Candytuft			
946F	EMPIRE SEED CO., Fredonia, N. Y. Umbellata, Mixed Colors..... Bridge Market, Huntington	Poor	Not Satisfactory
280F	PERRY SEED CO., Boston, Mass. Giant White Perfection.....	Good	Satisfactory
634F	J. B. RICE, JR., INC., Shushan, N. Y. Finest Mixed..... Fred F. Smith, Inc., Reading	Fair	Satisfactory
714F	STERLING SEED CO., Minneapolis, Minn. All Colors Mixed..... McLellan's Store, Boston	Fair	Satisfactory
IMPATIENS — Balsam			
807F	JOSEPH BRECK & SONS, Boston, Mass. Double Mixed..... F. B. Willis, East Bridgewater	Good	Satisfactory
1073F	W. ATLEE BURPEE CO., Philadelphia, Pa. Double Camellia Flowered, Mixed..... Murray & Dugdale Co., Haverhill	Good	Satisfactory
1101F	JEROME B. RICE SEED CO., Cambridge, N. Y. Bush Double White..... Metro Paint & Supply Co., Brockton	Good	Satisfactory
715F	STERLING SEED CO., Minneapolis, Minn. Balsam or Lady Slipper..... McLellan's Store, Boston	Good	Satisfactory
IPOMOEA — Morning Glory			
682F	JOSEPH BRECK & SONS, Boston, Mass. Heavenly Blue.....	Good	Satisfactory
705F	CROSMAN SEED CORPORATION, East Rochester, N. Y. True Heavenly Blue..... S. S. Kresge Co., Weymouth	Good	Satisfactory
945F	EMPIRE SEED CO., Fredonia, N. Y. Heavenly Blue..... Bridge Market, Huntington	Fair	Had not bloomed on September 25
619F	FERRY-MORSE SEED CO., Detroit, Mich. Heavenly Blue..... Davis Square Hardware Co., Weymouth	Good	Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
IPOMOEA—Concluded			
659F	FREDONIA SEED CO., Fredonia, N. Y. Mammoth Blue..... Bellingham Hardware Co., Weymouth	Fair	Satisfactory
864F	ROSS BROS. CO., Worcester, Mass. Heavenly Blue.....	Good	Satisfactory
633F	J. B. RICE, JR., INC., Shushan, N. Y. Scarlett O'Hara..... Fred F. Smith, Inc., Reading	Poor	Not Satisfactory
KOCHIA — Mexican Fire Bush			
799	W. ATLEE BURPEE CO., Philadelphia, Pa. Giant Christmas..... John E. Jordan Co., Plymouth	Fair	Satisfactory
1096F	THOMAS W. EMERSON CO., Beverly, Mass. Mexican Fire Bush..... F. B. Keene, Amesbury	None	
667F	CHARLES C. HART SEED CO., Wethersfield, Conn. Mexican Fire Bush..... Buzzard's Bay Hardware Co., Buzzard's Bay	Poor	Not Satisfactory
982F	NORTHROP, KING & CO., Minneapolis, Minn. Childs..... Arthur E. Sherman, Lanesboro	Poor	Not Satisfactory
892F	JEROME B. RICE SEED CO., Cambridge, N.Y. Childs..... Frank Howard, Inc., Pittsfield	Good	Satisfactory
LINUM — Flax			
1092F	THOMAS W. EMERSON CO., Beverly, Mass. Scarlet Flax..... F. B. Keene, Amesbury	Good	Had not bloomed on September 25
699F	NORTHROP, KING & CO., Minneapolis, Minn. Scarlet Flax..... F. W. Woolworth Co., Boston	Good	Had not bloomed on September 25
LOBELIA			
925F	PAGE SEED CO., Greene, N. Y. Bedding Queen..... Snyder's Store, Housatonic	Good	Satisfactory
LUPINUS — Lupine			
628F	MANDEVILLE & KING CO., Rochester, N. Y. Texas Blue Bonnet — Lupin Texensis..... Guy L. Harvey Hardware Stores, Inc., Jamaica Plain	Poor	Not Satisfactory Two plants: both died
MATHIOLA — Stock			
694F	FERRY-MORSE SEED CO., Detroit, Mich. Early Beauty of Nice, Carmine Rose..... Jordan Marsh Co., Boston	Good	Only 1 plant in bloom by September 25
658F	FREDONIA SEED CO., Fredonia, N. Y. Finest Mixed Double..... Bellingham Hardware Co., Weymouth	Good	Only 2 plants in bloom by September 25
700F	NORTHROP, KING & CO., Minneapolis, Minn. Evening Scented Mathiola bicornis..... F. W. Woolworth Co., Boston	Good	Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
MIRABILIS — Four O'Clock			
1089F	THOMAS W. EMERSON CO., Beverly, Mass. Marvel of Peru..... F. B. Keene, Amesbury	Poor	Not Satisfactory
717F	JEROME B. RICE SEED CO., Cambridge, N.Y. Finest Mixed..... Faneuil Hardware Co., Boston	Fair	Satisfactory
1070F	STERLING SEED CO., Minneapolis, Minn. Fine Mixed..... F. & W. Grand Silver Stores, Haverhill	Poor	Not Satisfactory
NEMESIA			
1102F	JEROME B. RICE SEED CO., Cambridge, N.Y. Triumph Mixed..... Metro Paint & Supply Co., Inc., Brockton	Fair	Satisfactory 9 colors
NEMOPIILA			
697F	NORTHROP, KING & CO., Minneapolis, Minn. Blue..... F. W. Woolworth Co., Boston	Good	Satisfactory
895F	JEROME B. RICE SEED CO., Cambridge, N.Y. Baby Blue Eyes..... Frank Howard, Inc., Pittsfield	Fair	Satisfactory
NIEREMBERGIA			
454F	THOMAS J. GREY CO., Boston, Mass. Coerulea — Purple Robe.....	Poor	Not Satisfactory
NIGELLA			
593F	THOMAS W. EMERSON CO., Beverly, Mass. Love-in-a-Mist.....	Poor	Not Satisfactory
698F	NORTHROP, KING & CO., Minneapolis, Minn. Love-in-a-Mist..... F. W. Woolworth Co., Boston	Good	Satisfactory
910F	J. B. RICE, JR., INC., Shushan, N. Y. Love-in-a-Mist..... Peirson Hardware Co., Pittsfield	Fair	Satisfactory
1071F	STERLING SEED CO., Minneapolis, Minn. Love-in-a-Mist..... F. & W. Grand Silver Stores, Haverhill	Good	Satisfactory
PAPAVER — Poppy			
693F	FERRY-MORSE SEED CO., Detroit, Mich. Double Shirley Sweet Briar..... Jordan Marsh Co., Boston	Good	Satisfactory
706-aF	GENESEE VALLEY SEED CO., Dalton, N. Y. Double Mixed..... S. S. Kresge Co., Boston	Poor	Not Satisfactory
706-bF	Genesee Best Mixture.....	Fair	Satisfactory — Shirley and Opium types
706-cF	Single Mixed.....	Good	Satisfactory. Few double flowered forms
706-dF	Shirley Mixed.....	Fair	Satisfactory
146F	HYGRADE SEED CO., Fredonia, N. Y. American Legion..... Allen School, East Bridgewater	Good	Satisfactory
1103F	JEROME B. RICE SEED CO., Cambridge, N.Y. American Legion..... Metro Paint & Supply Co., Inc., Brockton	Good	Satisfactory

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
PETUNIA			
	JOSEPH BRECK & SONS, Boston, Mass.		
683F	Balcony — Brilliant Rose	Poor	Not Satisfactory
685F	Glamour — Rich Salmon-Rose-Ruffled	Poor	Not Satisfactory
	CROSMAN SEED CORPORATION, East Rochester, N. Y.		
709-aF	Bright Pink S. S. Kresge Co., Boston	Poor	Not Satisfactory
709-bF	Velvety Red	Good	Satisfactory
709-cF	Velvety Purple	Good	Satisfactory
	THOMAS W. EMERSON CO., Beverly, Mass.		
592F	Hybrida violacea	Poor	Not Satisfactory
	THOMAS J. GREY CO., Boston, Mass.		
455F	Hybrida, Mars	Poor	Not Satisfactory 4 colors
456F	Hybrida Nana Compacta, Pure White	Good	Not Satisfactory 4 colors
	HYGRADE SEED CO., Fredonia, N. Y.		
145F	Exquisite Hybrida Allen School, East Bridgewater	Good	Satisfactory 5 colors
	JEROME B. RICE SEED CO., Cambridge, N. Y.		
582F	Balcony Blue People's Hardware Co., Lynn	Good	Satisfactory
669F	Balcony Rose Gallant Hardware Co., Onset	Fair	Not Satisfactory 3 colors
788F	Rose of Heaven Kingston Hardware Co., Kingston	Fair	Satisfactory
	ROSS BROS. CO., Worcester, Mass.		
865F	Rosy Morn	Good	Satisfactory
	STERLING SEED CO., Minneapolis, Minn.		
610F	Hybrida Blue J. J. Newberry Co., Woburn	Poor	Not Satisfactory
	VAUGHAN'S SEED STORE, Chicago, Ill.		
644F	Rose of Heaven (Pink) Harold Cogger, Reading	Good	Satisfactory
PHACELIA			
	MANDEVILLE & KING CO., Rochester, N. Y.		
1107F	Bluebells of California, Gentian Blue W. C. Fuller Co., Mansfield	Good	Satisfactory
PHLOX			
	THOMAS J. GREY CO., Boston, Mass.		
458F	Gigantea — Red Glory	Fair	Satisfactory
	MANDEVILLE & KING CO., Rochester, N. Y.		
1027F	Drummond — All colors Concord Hardware & Plumbing Supply Co., Concord	Poor	Not Satisfactory
PORTULACA			
	COMSTOCK, FERRE & CO., Wethersfield, Conn.		
1120F	Single Mixed Bell Hardware Co., Stoneham	Poor	Not Satisfactory
	FERRY-MORSE SEED CO., Detroit, Mich.		
723F	Double Mixed Diamond Hardware Stores, Inc., Mattapan	Poor	Not Satisfactory
770F	Single Mixed Dean Hardware Co., Lawrence	Fair	Satisfactory 8 colors

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
PORTULACA—Concluded			
791F	FREDONIA SEED CO., Fredonia, N. Y. Large Single Flowered Mixed G. Canovaro Hardware & Paint Co., No. Plymouth	Poor	Not Satisfactory
989F	CHARLES C. HART SEED CO., Wethersfield, Conn. Single Mixed Colors Phillips General Store, Williamstown	Poor	Not Satisfactory
144F	HYGRADE SEED CO., Fredonia, N. Y. Double and Single Mixed Allen School, East Bridgewater	Fair	Satisfactory 7 colors
RESEDA — Mignonette			
947F	EMPIRE SEED CO., Fredonia, N. Y. Sweet Odorata Grandiflora Bridge Market, Huntington	Poor	Not Satisfactory
622F	CHARLES C. HART SEED CO., Wethersfield, Conn. Giant Machet Type Brigham Hardware Supply Co., Boston	Poor	Satisfactory
780F	THORNTON & CROUCH, Lawrence, Mass. Golden Goliath	Poor	Not Satisfactory
RUDBECKIA			
684F	JOSEPH BRECK & SONS, Boston, Mass. Golden Sunset	Fair	Satisfactory
SALPIGLOSSIS			
147F	HYGRADE SEED CO., Fredonia, N. Y. Exquisite Mixed Colors Allen School, East Bridgewater	Fair	Satisfactory 6 colors
282F	PERRY SEED CO., Boston, Mass. Emperor, Purple and Gold	Fair	Satisfactory
1104F	JEROME B. RICE SEED CO., Cambridge, N. Y. Mixed Metro Paint & Supply Co., Brockton	Good	Satisfactory 7 colors
SALVIA			
594F	THOMAS W. EMERSON CO., Beverly, Mass. Spendens	Poor	Not Satisfactory. Had not bloomed on September 25
739F	LITTLE TREE FARMS, Framingham Center, Mass. Bonfire	Poor	Not Satisfactory. Had not bloomed on September 25
SCABIOSA			
1074F	W. ATLEE BURPEE CO., Philadelphia, Pa. Tall Double Mixed Murray & Dugdale Co., Haverhill	Poor	Not Satisfactory. Had not bloomed on September 25
948F	EMPIRE SEED CO., Fredonia, N. Y. Mourning Bride — Tall Double, All Colors Bridge Market, Huntington	Poor	Not Satisfactory. Had not bloomed on September 25
852F	FRASER'S, Wellesley, Mass. Blue Cockade	Fair	First flower on September 25
670F	CHARLES C. HART SEED CO., Wethersfield, Conn. Mourning Bride Mixed Gallant Hardware Co., Onset	Fair	Had not bloomed on September 25

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
SCABIOSA— Concluded			
LITTLE TREE FARMS, Framingham Center, Mass.			
742F	Blue Cockade.....	Poor	Not Satisfactory. Had not bloomed on September 25
PERRY SEED CO., Boston, Mass.			
283F	Grandiflora — Giant Flower Hybrids.....	Good	First flower on September 25
J. B. RICE, JR., INC., Shushan, N. Y.			
912F	Mourning Bride Mixed..... Peirson Hardware Co., Pittsfield	Poor	Not Satisfactory. Had not bloomed on September 25
SCHIZANTHUS			
J. B. RICE, JR., INC., Shushan, N. Y.			
976F	Butterfly Flower Mixed..... Shaker's Store, Adams	Good	Satisfactory
TAGETES — Marigold			
JOSEPH BRECK & SONS, Boston, Mass.			
680F	Canary Bird — Single, French.....	Fair	Satisfactory
681F	Limelight, Chrysanthemum Flowered.....	Good	Satisfactory
W. ATLEE BURPEE CO., Philadelphia, Pa.			
729F	Odorless Foliage, Special Mixture..... The Fair, Roslindale	Good	Satisfactory
CROSMAN SEED CORPORATION, East Rochester, N. Y.			
720F	Gigantea — Sunset Giants..... S. S. Kresge Co., Jamaica Plain	Good	Satisfactory
THOMAS W. EMERSON CO., Beverly, Mass.			
591F	Guinea Gold.....	Poor	Not Satisfactory
THOMAS J. GREY CO., Boston, Mass.			
449F	Butterball — French Dwarf Double.....	Good	Satisfactory
450F	Yellow Supreme Double African Carnation Flowered.....	Good	Had not bloomed on September 25
451F	Melody — Golden Yellow French Dwarf Double Harmony.....	Good	Satisfactory
452F	Golden Bedder — Dwarf Chrysanthemum Flowered.....	Good	Satisfactory
HYGRADE SEED CO., Fredonia, N. Y.			
98F	Orbit..... Franklin School, Holbrook	Good	Satisfactory
142F	Sunset Giants and California Giants Mixed..... Allen School, East Bridgewater	Good	Only 2 blooms on September 25
MANDEVILLE & KING CO., Rochester, N. Y.			
618F	Burpee Gold..... Davis Hardware Co., Somerville	Good	Satisfactory
JEROME B. RICE SEED CO., Cambridge, N. Y.			
581F	Burpee Gold..... People's Hardware Co., Lynn	Good	Satisfactory
ROSS BROS. CO., Worcester, Mass.			
863F	Orange — All Double.....	Good	Had not bloomed on September 25
STERLING SEED CO., Minneapolis, Minn.			
609F	Harmony — Dwarf French..... J. J. Newberry Co., Woburn	Good	Satisfactory
VAUGHAN'S SEED STORE, Chicago, Ill.			
643F	Sunset Giants, Dahlia Flowered..... Harold Cogger, Reading	Good	Only 1 bloom on September 25

FLOWER SEED INSPECTION — Continued

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
TROPAEOLUM — Nasturtium and Canary Vine			
800F	JOSEPH BRECK & SONS, Boston, Mass. Dwarf John E. Jordan Co., Plymouth	Good	Satisfactory 8 colors
597F	THOMAS W. EMERSON CO., Beverly, Mass. Canary Vine — Bird Vine	None	
602F	Golden Gleam Arlington Hardware, Inc., Arlington	Poor	Not Satisfactory Chiefly single mixed
851F	FRASER'S, Wellesley, Mass. Dwarf Double Golden Globe	Good	Not Satisfactory Chiefly single mixed
632F	CHARLES C. HART SEED CO., Wethersfield, Conn. Dwarf Mixed Fred F. Smith, Inc., Reading	None	
143F	HYGRADE SEED CO., Fredonia, N. Y. Nasturtium — Golden Gleam Allen School, East Bridgewater	Good	Satisfactory
589F	D. LANDRETH SEED CO., Bristol, Pa. Dwarf Mixed Salem Hardware Co., Inc., Salem	Good	Not Satisfactory Climbing type
753F	F. H. WOODRUFF & SONS, Milford, Conn. Double Golden Gleam Boston Supply Co., Framingham	Good	Satisfactory
997F	UNKNOWN Dwarf Burlingame & Darbys Co., North Adams	Good	Satisfactory 6 colors
VENIDIUM			
962F	MANDEVILLE & KING CO., Rochester, N. Y. All Shades Berkshire Hardware Co., Pittsfield	Fair	Satisfactory 3 colors
VERBENA			
760F	W. ATLEE BURPEE CO., Philadelphia, Pa. Giant Mixed Baker Hardware Co., Wellesley	Fair	Satisfactory
704-aF	CROSMAN SEED CORPORATION, East Rochester, N. Y. Defiance — Scarlet S. S. Kresge Co., Boston	Fair	Satisfactory
704-bF	Collosea — Pink	Fair	Satisfactory
704-cF	Blue Shades	Good	Satisfactory
726F	FERRY-MORSE SEED CO., Detroit, Mich. Scarlet Reliable Hardware Co., Mattapan	Poor	Not Satisfactory
453F	THOMAS J. GREY CO., Boston, Mass. Anapolis Blue	Poor	Not Satisfactory
457F	Hybrid Rose Glow	Poor	Not Satisfactory
662F	NORTHRUP, KING & CO., Minneapolis, Minn. Mammoth Flowering Blue Shades F. W. Woolworth Co., Boston	Poor	Not Satisfactory
911F	J. B. RICE, JR., INC., Shushan, N. Y. Choice Mixed Peirson Hardware Co., Pittsfield	Fair	Satisfactory 5 colors

FLOWER SEED INSPECTION — Concluded

Lab. No.	Kind and Variety of Seed, Wholesale Distributor, Dealer When Other Than Wholesale Distributor, and Place Collected	Field Tests	
		Germination	Performance
ZINNIA			
JOSEPH BRECK & SONS, Boston, Mass.			
686F	California Giant, Cerise Queen.....	Good	Satisfactory
687F	California Giant, Brightness.....	Good	Satisfactory
688F	California Giant, Golden Queen.....	Good	Satisfactory
689F	Cupid Goblin.....	Poor	Not Satisfactory
W. ATLEE BURPEE CO., Philadelphia, Pa.			
850F	Navajo Mixed Colors..... C. B. Coburn Co., Lowell	Good	Satisfactory 9 colors
CROSMAN SEED CORPORATION, East Rochester, N. Y.			
710-aF	Canary Yellow..... S. S. Kresge Co., Boston	Fair	Satisfactory
710-bF	Rose Pink.....	Fair	Satisfactory
710-cF	Salmon.....	Fair	Not Satisfactory — included yellow and orange
DEERINGTON ZINNIA GARDENS, Bargersville, Ind.			
702F	Dahlia Flowered Pride of Indiana..... S. S. Kresge Co., Boston	Good	Satisfactory
1019F	Baby Bee, Double Bloom, Mixed Colors.....	Good	Satisfactory 7 colors
FRASER'S, Wellesley, Mass.			
614F	Scarlet Flame, Dahlia Flowered.....	Good	Satisfactory
FREDONIA SEED CO., Fredonia, N. Y.			
656F	Dahlia Flowered, Red..... Bellingham Hardware Co., Weymouth	Fair	Satisfactory
THOMAS J. GREY CO., Boston, Mass.			
459F	Striata — Old Glory.....	Good	Satisfactory
HYGRADE SEED CO., Fredonia, N. Y.			
148F	Double Giant, Dahlia Flowered, Mixed Colors..... Allen School, East Bridgewater	Good	Satisfactory 6 colors
MANDEVILLE & KING CO., Rochester, N. Y.			
629F	Rosebud Pompon..... Guy L. Harvey Hardware Stores, Inc., Jamaica Plain	Fair	Satisfactory
NORTHRUP, KING & CO., Minneapolis, Minn.			
661F	Giant Double Orange King..... F. W. Woolworth Co., Weymouth	Good	Satisfactory
JEROME B. RICE SEED CO., Cambridge, N. Y.			
674F	Fantasy..... Church & Stowell, Wareham	Good	Satisfactory 7 colors
789F	Super Giant, Golden Dawn..... Kingston Hardware Co., Kingston	Good	Satisfactory
ROSS BROS. CO., Worcester, Mass.			
866F	Dahlia Flowered Oriole.....	Good	Not Satisfactory 4 colors
STERLING SEED CO., Minneapolis, Minn.			
607F	Scarlet Flame, Dahlia Flowered..... J. J. Newberry Co., Woburn	Good	Satisfactory
UNKNOWN			
1003F	Assorted..... Lev Hardware Co., No. Adams	Poor	Not Satisfactory

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

Control Series

Bulletin No. 116

July 1943

**Twenty-third Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

In comparison with the previous season there was a slight decrease in the number of flocks and birds tested and an increase in the percentage of positive tests. Although there were fewer non-reacting flocks, both the number and percentage of birds in these flocks showed a slight increase. On the whole, the results are encouraging when considered in connection with the conditions which confronted flock owners during the year.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

TWENTY-THIRD ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS

1942-1943

By the Poultry Disease Control Laboratory¹

INTRODUCTION

The poultry industry in all its phases has been directly and markedly affected by conditions brought on by the war. In pullorum disease testing, the demand for testing has increased in some states while in others no perceptible change or even a decrease has been observed. In Massachusetts, the demand for testing has decreased during the past season which is attributed in part to the shortage of labor and to the great demand for chicks regardless of whether or not they were from officially tested flocks.

It is unfortunate that a state control and eradication program does not receive full emphasis in a time when increased production is requested. Some flocks, ordinarily used for meat and egg production, are now being mated for breeding purposes. The pullorum status of such flocks should first be determined. Likewise, some flocks that have been used for breeding purposes on a small scale have increased their output and distribution of stock with little or no regard for official pullorum testing.

Massachusetts flock owners have built up an enviable reputation for freedom from pullorum disease during the past ten years. It is to be hoped that flock owners who have found it necessary to drop pullorum testing or flock owners who for the first time have had breeding flocks which were not tested, will realize that a sound program cannot be built on disease hazards.

The increased demand for stock from other states, especially from the broiler growing centers, is in a great measure due to the fine quality of stock that has been developed through breeding and pullorum eradication by the stable breeders in the State. To them credit is due for the progress that has been made in pullorum disease eradication in Massachusetts. It is hoped that flock owners who have recently entered or plan to enter into a breeding program will not ignore official pullorum disease testing. In this manner pullorum disease dissemination will be further reduced and also give purchasers more sources from which to buy pullorum-free stock. The replacing of flocks with pullorum-free stock is an effective and in the majority of instances the most economical way of eliminating the disease.

Appreciation is again extended to the various agencies that have given direct or indirect assistance to pullorum disease eradication. It should be emphasized that the necessity for the dissemination of reliable information at the appropriate time cannot be ignored in this program. Various agencies such as the Massachusetts Department of Agriculture, State and County Extension Services, feed dealers, and other service agencies that make direct or indirect contact with the flock owners, can be of great aid to the eradication program. The flock owner should be informed that the main burden of eradication rests on his shoulders but that this burden will be greatly lessened if certain effective measures are followed.

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Chief of Laboratory; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; Miriam K. Clarke, Research Assistant; Felicia Jewett, Laboratory Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

TABLE 1. DISTRIBUTION OF TESTS AND REACTORS BY COUNTIES AND BY BREEDS

Breeds	Barnstable	Ferksline	Plymouth	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Percent Positive Tests
Rhode Island Reds.....(Total tests)	2,826	8,249	66,074	74	61,850	22,906	15,866	24,111	75,454	42,316	29,158	92,099	440,983	
.....(Positive tests)	0	185	18	0	13	0	0	2	10	997	249	1,290	2,764	0.63
Barred Plymouth Rocks.....(Total tests)	581	2,056	18,594	2,165	7,338	20,512	3,560	3,584	15,966	12,227	13,839	19,668	120,090	
.....(Positive tests)	0	15	10	0	3	15	0	3	3	129	1	69	248	0.21
White Plymouth Rocks.....(Total tests)	.....	.....	18	.....	2,200	76	773	1,125	5,791	3,253	11,738	.....	24,974	
.....(Positive tests)	.....	.....	0	.....	0	0	0	0	0	3	0	.....	3	0.01
White Leghorns.....(Total tests)	.....	3,298	2,695	.....	3,612	.....	.....	31	.....	.....	.....	.....	9,636	
.....(Positive tests)	.....	0	0	.....	0	.....	.....	0	.....	.....	.....	.....	0	0.00
New Hampshires.....(Total tests)	.....	.....	7,426	.....	5,439	3,210	.....	395	2,731	12,248	15,667	961	48,077	
.....(Positive tests)	.....	.....	46	.....	0	0	.....	0	0	50	0	0	96	0.20
Miscellaneous.....(Total tests)	357	270	937	.....	813	.....	267	.....	133	1,846	97	657	5,377	
.....(Positive tests)	0	0	0	.....	2	.....	0	.....	0	0	0	0	2	0.04
Total Tests.....	3,764	13,873	95,744	2,239	81,252	46,704	20,466	29,246	100,075	71,890	70,499	113,385	649,137	
Positive Tests.....(Number)	0	200	74	0	18	15	0	5	13	1,179	250	1,359	3,113	
.....(Percent)	0.00	1.44	0.08	0.00	0.02	0.03	0.00	0.02	0.01	1.64	0.35	1.20	0.48	

Summary of Service Rendered

Applications received.....		377
Applications cancelled.....		15
Flocks tested.....		362
Chicken flocks.....	323	
Chicken and turkey flocks.....	9	
Turkey flocks.....	30	
Number of tests.....		662,995
Chickens:		
Routine.....	644,676	
Experimental.....	9,557*	
Fowl other than chickens:		
Routine.....	8,522	
Experimental.....	240**	
Owners receiving necropsy service.....		23 †
Necropsies of reacting birds.....		47 ‡

* Includes 5,096 paratyphoid tests.

** Includes 232 paratyphoid tests.

† Includes one turkey flock.

‡ Includes three turkeys.

Distribution of Tests and Reactors

Table 1 gives the distribution of tests and reactors by counties and by breeds. A total of 649,137 chicken samples was submitted for test from 12 counties, and 3,113 or 0.48 percent reactors were detected. Three counties revealed no reactors, six had less than one percent, and three had between one and two percent. Worcester, Middlesex, and Bristol Counties led in the number of samples tested.

Of the total number of samples tested, 588,651 were obtained from females (hens 64,185 and pullets 524,466) and 60,486 from males. The percentages of the reactors were 0.05 among the hens, 0.48 among the pullets, and 0.45 among the males.

The following breeds and varieties were tested: Bantam, Barred Plymouth Rock, Black Langshan, Brahma, Columbian Plymouth Rock, Crosses, New Hampshire, Rhode Island Red, Silver Laced Wyandotte, White American, White Cornish, White Leghorn, White Plymouth Rock, and White Wyandotte. Rhode Island Red and Barred Plymouth Rock are the predominating breeds. Reactors were detected among the Barred Plymouth Rocks, Crosses, New Hampshires, Rhode Island Reds, and White Plymouth Rocks.

Annual Testing of Flocks

Table 2 shows the results among flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years.

Flocks tested for the first time numbered 27, representing 22,938 birds which revealed 6.34 percent reactors. A considerable decrease in the number of flocks and number of birds was observed in comparison with the previous season. The amount of infection showed a considerable increase over the previous season (1941-42, 0.04 percent; and 1942-43, 6.34 percent). The reactors were confined to three flocks. Twenty-four flocks representing 19,541 birds were found to be non-reacting.

In the intermittent group, 19 flocks representing 18,363 birds, were tested. In comparison with the previous season, a marked decrease is noted in the number of flocks and birds tested. The percentage of infection, 1.05, was higher than

that of the previous season. The reactors were confined to one flock which was heavily infected. Eighteen flocks were found to be non-reacting.

The results for the flocks tested for two consecutive years reveal a considerable increase over the previous season in the number of flocks and birds tested. A total of 62 flocks, representing 85,638 birds, was tested. The percentage of infection was 0.25. The reactors were confined to three flocks. A total of 59 flocks, representing 82,193 birds, was non-reacting.

In the group tested for three or more years, 224 flocks representing 510,727 birds were tested. The percentage of reactors was 0.24 which is the lowest for all groups. A total of 216 non-reacting flocks, representing 481,826 birds, was detected in this group. Only eight positive flocks were identified. The majority of reactors detected in this group was found in one flock.

Considering the four groups as a whole, 295 flocks, representing 583,733 birds or 91 percent of the total birds tested, were 100 percent tested and non-reacting. It is encouraging to note that such a high percentage of the birds tested are in 100 percent tested non-reacting flocks. However, one should not ignore the number of birds (37,059) in infected flocks nor the average percentage of infection (8.4) for those flocks. It should be indicated that the bulk of this infection was limited to a few flocks. It is hoped that these heavily infected flocks will be replaced by pullorum clean stock.

TABLE 2. ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially tested	100% Tested	Partially Tested
Tested for the first time.....	27	22,938	22,938	1,455	6.34	22	2	3	0
Intermittent testing.....	19	18,363	18,363	192	1.05	12	6	1	0
Two consecutive years.....	62	85,638	88,956	223	0.25	59	0	3	0
Three or more consecutive years..	224	510,727	518,880	1,243	0.24	202	14	5	3
Totals.....	332	637,666	649,137	3,113	0.48	295	22	12	3

The results in Table 2 indicate that flocks with two or more years of testing are apt to have a lower incidence of infected flocks as well as a lower percentage of reactors. Annual testing along with sound eradication and prevention measures is certain to produce successful results in establishing and maintaining pullorum-free flocks. It is unfortunate that some flock owners are unable or unwilling to follow a program of this sort.

Appearance of Infection in Flocks Previously Negative

Table 3 gives the testing results for flocks which had been non-reacting for one or more years but showed infection in 1942-43. Thirteen "breaks" are listed and in only two instances was the amount of infection above one percent.

TABLE 3. APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

Flock	Number of Years Negative	1942-43 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	4	546	546	0.18	Unknown
2	1	1,916	1,916	0.63	Unknown
		1,331	1,331*	0.00	
3	4	2,051	2,049	0.05	Unknown
		1,392	1,392*	0.00	
4	9	1,347	1,347	1.34	Custom hatching
5	1	2,443	1,276	3.21	Custom hatching
		2,100	452*	2.43	
		400	22*	0.00	
6	4	788	488	0.61	No information
7	14	1,767	1,766	0.17	Unknown
		1,512	1,512*	0.00	
8	2	652	650	0.15	Introduced untested stock
9	1	836	836	0.36	Introduced doubtful stock
		798	798*	0.00	
10	3	10,956	10,956	0.06	Contest birds
		10,900	200*	0.00	
11	1	1,018	1,005	0.20	Unknown
		889	139*	0.00	
12	3	5,519	5,519	0.02	Purchased new stock
		5,500	5,22*	0.00	
13	6	2,652	2,652	0.98	Unknown
		2,600	1,745*	0.00	

*Represents retests

Four flocks had been negative for one year, one for two years, two for three years, three for four years, and three for six years or more. In seven cases the explanation for the infection was unknown, in two the infection was apparently introduced through custom hatching, in three flocks possibly through new stock, and in one flock through returned contest birds.

The number of "breaks" was more than double that of the previous season. Whether this trend can be attributed to war conditions is difficult to determine. However with circumstances as they exist, flock owners are urged to become more vigilant in disease prevention and give greater attention to the following measures that are so essential in establishing and maintaining pullorum-free flocks.

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment, should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum-disease-free flocks. Consult your county agent regarding additions or replacements in your flock.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum-disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

Testing of Fowl Other Than Chickens

During the past season 8,522 turkeys, 6 pheasants, and 2 guinea fowl were tested for pullorum disease. No reactors were detected among the pheasants and guinea fowl. Eighty-four turkey reactors were detected, all of which were in one flock. The reactions observed were not very definite and conclusive but upon necropsy of a few of the reacting birds, the causative organism of pullorum disease was isolated. The flock history also revealed that pullorum infection had been found in the poult raised from the infected breeding flock. Aside from this one flock, pullorum disease appears to be of little or no significance in Massachusetts turkey flocks. Owners of turkey breeding flocks are cautioned about introducing new stock because pullorum disease can readily be introduced through such a practice. Also, avenues of infection must be considered such as raising chickens on the same premises and disregarding the pullorum status of the chickens. Custom hatching for infected or untested chicken and turkey flocks or having eggs hatched where infection may be present are in some instances responsible for introducing infection into turkey breeding flocks. Massachusetts turkey breeders should exercise every precaution in protecting and safeguarding their flocks against pullorum infection.

Only a small number of turkeys were tested for paratyphoid infection. A test fluid containing *S. typhi-murium* was used. No paratyphoid reactors were detected. While in some instances the test may aid in partial control of the infection, for the most part the agglutination test cannot be relied upon to eliminate the infection from the flock. Turkey flock owners must recognize this fact and not be led astray by sales or advertising talk that stock tested for paratyphoid infection is free of such infection when no reactors have been found. There are many different types of organisms in the paratyphoid group and a test fluid prepared with one type might not be effective in detecting carriers of other types. If turkey buyers wish to make an effort to avoid paratyphoid infection, the flock history should serve as the most reliable guide. The state diagnostic laboratories can usually give one the desired information that may be available.

Non-Reacting and Positive Flocks Classified by Counties

Table 4 gives the distribution of non-reacting and positive flocks by counties. No reactors were found among 295 one hundred percent tested and 22 partially tested flocks. The total number of birds in the 100 percent tested non-reacting flocks was 583,733 and in the partially tested non-reacting group, 16,874. Worcester, Essex, Middlesex, Bristol, and Plymouth Counties led, in the order listed, in the number of non-reacting flocks and birds. In Barnstable, Berkshire, Dukes, and Franklin Counties all flocks were 100 percent tested.

A total of 15 infected flocks which were distributed among eight counties was detected. Three counties had one infected flock each, three counties two each, and two counties three each. Norfolk County had the largest number of birds in infected flocks. Fewer infected flocks and birds in such flocks are listed than were listed in the previous report.

The results in this table show that non-reacting stock is available in all of the counties listed. Flock owners with infected flocks should make every effort possible to eliminate their infected flocks or birds and replace them with pullorum-free stock. It is hoped that some day the number of infected flocks will be insignificant. This can be accomplished only through systematic, conscientious testing and the adoption of measures designed to eliminate the infection and to prevent the reintroduction of the disease.

TABLE 4. NONREACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable.....	2	3,764	—	—	2	3,764
Berkshire.....	6	10,388	—	—	6	10,388
Bristol.....	41	86,344	4	3,756	45	90,100
Dukes.....	1	2,239	—	—	1	2,239
Essex.....	44	78,620	3	1,923	47	80,543
Franklin.....	26	44,575	—	—	26	44,575
Hampden.....	18	20,354	2	112	20	20,466
Hampshire.....	22	26,325	1	1,289	23	27,614
Middlesex.....	40	90,727	3	2,487	43	93,214
Norfolk.....	21	46,012	2	1,716	23	47,728
Plymouth.....	25	65,513	4	3,868	29	69,381
Worcester.....	49	108,872	3	1,723	52	110,595
Totals.....	295	583,733	22	16,874	317	600,607
Positive Flocks						
Berkshire.....	1	1,164	—	—	1	1,164
Bristol.....	2	2,623	1	633	3	3,256
Essex.....	1	709	—	—	1	709
Hampshire.....	2	1,493	—	—	2	1,493
Middlesex.....	3	4,083	—	—	3	4,083
Norfolk.....	—	—	2	22,450	2	22,450
Plymouth.....	1	1,114	—	—	1	1,114
Worcester.....	2	2,790	—	—	2	2,790
Totals.....	12	13,976	3	23,083	15	37,059

Comparison of 1941-42 and 1942-43 Testing

Table 5 gives the comparison of the 1941-42 and 1942-43 testing results for the different counties. Fewer flocks, birds, and samples were tested during the past year than in 1941-42. Also, fewer non-reacting flocks were identified but fortunately the number of birds in non-reacting flocks was greater than in the previous season. The percentage of infection was higher during the 1942-43 season. This is largely attributed to a few flocks with a high rate of infection.

The trend in the pullorum eradication work does not appear as encouraging as in previous years. While the majority of flocks are being tested 100 percent annually with no reactors, yet a large number of flocks in the State are following a haphazard method of testing which does not contribute to a sound state-wide disease control and eradication program. Too many poultrymen, commercial, and non-commercial agencies have the "take a chance" attitude. This may bring apparent success for a while but sooner or later reverses begin to arise. In such instances, the person in trouble wants immediate help and relief which it may not be possible to render in spite of the urgency of the request. If a sound program is followed from year to year, one is less apt to encounter trouble than if one intermittently or never observes effective measures for the control of pullorum disease.

TABLE 5. COMPARISON OF 1941-42 AND 1942-43 TESTING

County	Flocks	Birds	Tests	Positive Tests Percent	Non-Reacting Flocks
1941-42 Season					
Barnstable.....	2	3,713	3,713	0.00	2
Berkshire.....	4	7,472	7,472	0.31	2
Bristol.....	52	86,527	86,527	0.003	51
Dukes.....	2	2,541	2,541	0.00	2
Essex.....	55	82,020	82,104	0.006	53
Franklin.....	33	56,072	56,072	0.00	33
Hampden.....	23	18,462	18,528	0.03	20
Hampshire.....	31	29,042	30,892	0.04	31
Middlesex.....	54	106,191	106,531	0.07	49
Norfolk.....	29	90,864	98,159	1.67	27
Plymouth.....	31	66,421	66,421	0.00	31
Suffolk.....	1	608	608	0.00	1
Worcester.....	49	103,147	103,147	0.002	48
Totals.....	366	653,080	662,715	0.27	350
1942-43 Season					
Barnstable.....	2	3,764	3,764	0.00	2
Berkshire.....	7	11,552	13,873	1.44	6
Bristol.....	48	93,356	95,744	0.08	45
Dukes.....	1	2,239	2,239	0.00	1
Essex.....	48	81,252	81,252	0.02	47
Franklin.....	26	44,575	46,704	0.03	26
Hampden.....	20	20,466	20,466	0.00	20
Hampshire.....	25	29,107	29,246	0.02	23
Middlesex.....	46	97,297	100,075	0.01	43
Norfolk.....	25	70,178	71,890	1.64	23
Plymouth.....	30	70,495	70,499	0.35	29
Worcester.....	54	113,385	113,385	1.20	52
Totals.....	332	637,666	649,137	0.48	317

Twenty-Three-Year Testing Summary

Table 6 gives the testing results for a 23-year testing period. These data are presented to show that pullorum disease can be eradicated from flocks and that flocks can be maintained at such a status. The average individual cannot appreciate the full value of the outstanding progress which has been made in eliminating this disease from the majority of breeding flocks in the State. Similar accomplishments may be observed in other states where effective measures and high standards of work have been adopted.

TWENTY-THREE-YEAR PULLORUM DISEASE TESTING SUMMARY

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

Comments and Suggestions

Annual Testing: The subject of annual testing cannot be stressed too greatly because it is an apparent fact that one cannot be certain of a flock status if the birds are not tested annually. This statement is borne out by the discussion on the data in Table 3. Considering the scattered foci of pullorum infection in the State, the unrestricted traffic of diseased birds, and other possible factors that may play an important role in the dissemination of the disease, one cannot afford to operate a breeding flock without knowing the pullorum status.

It is rather alarming to note that 21 percent of the poultrymen who had their flocks tested during the 1941-42 season failed to have a test during 1942-43. Very little can be gained by testing for only one year or testing every other year. Furthermore, official recognition by the Massachusetts Department of Agriculture is not given unless a flock is tested and found free of infection. Official recognition is of distinct value when one sells hatching eggs, chicks, or mature stock. It

means that the stock has been officially certified as having met certain requirements. Far too many flock owners fail to take advantage of this official grading service.

Testing All Birds on Premises: The testing of all birds over five months of age on the premises is a time-tried practice which has proved effective in identifying pullorum-free flocks. One cannot be certain that a flock is free of pullorum disease by testing only part of the mature birds. This is especially true in flocks where the amount of infection is small, and may be confined to the untested part of the flock. Actual testing records show that one reactor has been detected in a flock and it so happened that the reactor was the last bird tested in the flock. It is true that in some flocks partial testing has been practiced with apparent success but for a general program in which flocks are officially graded, partial flock testing cannot be considered a safe and reliable procedure. It is hoped that more flock owners will adopt the 100 percent testing program so that their flocks will be eligible for official grading by the Massachusetts Department of Agriculture if no reactors are found.

Prevention of Pullorum Infection: During the past year, it has been observed that some flock owners are not as careful in selecting their hatching eggs for custom hatching as they should be. In view of the great demand for hatching eggs, the careful selection of pullorum-free flocks has been somewhat neglected. Custom hatching is one of the easiest means of spreading pullorum infection, therefore hatcherymen and flock owners should exercise every possible precaution against selecting eggs from infected or untested stock.

Likewise some breeders have taken chances on purchased males, especially when cross-bred stock was desired. Males can be infected with pullorum disease and should be considered a possible source of infection when introduced into a pullorum-free flock.

In view of the shortage of equipment and materials, used poultry equipment is in great demand and is being purchased by flock owners and hatcherymen. Also, used equipment is sometimes being loaned among poultrymen without certain precautionary measures. The purchase or loan of used equipment is not condemned, especially in war times, but if proper precautionary measures against disease transmission are not taken, flock owners and hatcherymen may invite trouble.

With the shortage and high cost of labor, poultrymen are finding it very difficult to do their work as efficiently as they would like. With all the problems confronting the industry, it is natural that some practices have to be eliminated or modified. Some flock owners have eliminated pullorum disease testing, which cannot be regarded as sound procedure and a safeguard to the flock. It is hoped that breeding flocks will be tested even though war time conditions may seem to suggest otherwise.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 117

SEPTEMBER 1943

**Inspection of Commercial
Feedstuffs**

By the Feed Control Staff

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This is the forty-ninth report of feeding stuffs inspection. It contains information relative to the carotene content of alfalfa meals, the riboflavin content of various products, and the protein quality index of fish and meat meals found on the Massachusetts markets.

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MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith¹

The feed situation as it exists under war conditions is a matter of common knowledge and experience. Commercial feed formulas change almost from day to day as the manufacturer finds it necessary to alter his products on account of government directives or the shortage of vital material. For the greater part manufacturers are to be commended for the skill and ingenuity they have shown in surmounting the problems with which they were confronted.

The Massachusetts feeding stuffs act requires that manufacturers register annually with Feed Control Service the guarantee of protein, fat, and fiber placed on their various products, together with a list of the ingredients from which they are made. Minor changes which did not materially affect the analysis of a feed have previously been allowed. In order not to restrict the free flow of such feeds as are available, the manufacturer is now allowed to make any change in his registered feed formulas made necessary by government directive or material shortage without re-registration provided his guarantee is corrected and he files with Control Service a notice of the change. It is believed that the user has the right to know at all times exactly what he must purchase even though he cannot get exactly what he wants. On the whole, cooperation on the part of manufacturers has been excellent, although in isolated cases guarantee tags have been found to bear only a slight relation to the material they purported to guarantee.

The scarcity of certain materials ordinarily used in poultry and animal rations and the more general use of substitutes should lead to a somewhat broader examination of feeding stuffs than that required by the feeding stuffs act. This has particular application to the vitamins and mineral ingredients. Examination of poultry feeds should be made to determine that the balance between calcium and phosphorus is not upset and that fluorine is not present in amount sufficient to be detrimental to the animals or poultry fed.

While 1,340 samples of feeding stuffs have been officially collected and examined, the results will not be published as it is believed that they will convey no useful information when compared with feeding stuffs now on the market, nor can the analyses form a sound basis for judgment in the selection for purchase of feeding stuffs offered at present.

Considerable time has been spent in the examination of feed ingredients for carotene, riboflavin, and the protein quality index of meat and fish products. Such results should have a more permanent application. Tables of the analyses made and a discussion of the results are therefore presented.

¹The following staff members assisted in the inspection: John W. Kuzmeski, H. Robert DeRose, Albert F. Spelman, Leo V. Crowley, and C. Tyson Smith, chemists; Frederick A. McLaughlin, microscopist; James T. Howard, inspector; Joseph A. Martell, Laboratory Assistant; Cora B. Grover, clerk.

Carotene and Riboflavin Content of Alfalfa and Alfalfa Leaf Meal

The samples are somewhat like those reported in Bulletin 113. In some instances the carotene content is so low that the product is practically valueless as a source of carotene in poultry feeds. In others the content is excellent. Opinion is that alfalfa products when used as a carotene source should contain at least 50,000 International Units per pound expressed in terms of Vitamin A equivalent. Carotene is extremely unstable and is destroyed by high temperatures, aging, and dampness. If alfalfa is to be held for long periods, it should be under carefully controlled conditions. Some experimental work is being conducted in search of a stabilizer to be added to alfalfa meals to prevent loss of carotene.

Alfalfa is a fairly satisfactory source of riboflavin. While it does not hold true in every instance, the riboflavin content is generally high where the carotene is also high.

Many of the samples analyzed exceeded their maximum fiber guarantees, a condition that can easily be corrected by increasing the fiber guarantee to conform to the product.

Alfalfa and Alfalfa Leaf Meal

Manufacturer and Brand	Water %	Protein		Fat		Nitrogen Free Extract %	Fiber		Ash %	Carotene Parts per Million	Vitamin A Equivalent Internat onal Units per Pound	Riboflavin Parts per Million
		Found %	Guar- anteed %	Found %	Guar- anteed %		Found %	Guar- anteed %				
A. B. Caple Co., Toledo, Ohio												
No. 1 Alfalfa Meal	10.0	16.0	13.0	1.7	1.0	37.9	26.0	33.0	8.4	52	39,312	14.8
No. 1 Alfalfa Meal	9.6	13.9	13.0	1.7	1.0	39.3	29.5	33.0	6.0	20	15,120	9.1
No. 1 Alfalfa Meal	9.6	12.5	13.0	1.5	1.0	36.7	33.0	33.0	6.7	25	19,656	7.4
No. 1 Alfalfa Meal	14.4	12.2	13.0	1.3	1.0	34.1	31.4	33.0	6.6	9	6,804	9.0
17% Capex Dehyd. Alfalfa Meal	8.2	18.5	17.0	2.6	2.0	34.4	27.4	27.0	5.9	133	100,548	16.8
17% Capex Dehyd. Alfalfa Meal	6.0	18.5	17.0	2.3	2.0	36.2	28.2	27.0	8.8	141	106,596	16.3
17% Capex Dehyd. Alfalfa Meal	7.2	17.9	17.0	2.6	2.0	41.1	23.9	27.0	7.3	115	109,620	18.4
Capex 20% Dehyd. Alfalfa Leaf Meal	7.3	20.4	20.0	2.9	2.0	38.1	22.7	20.0	8.6	202	152,712	—
Denver Alfalfa Milling & Products Co., Lamar, Col.												
Alfalfa Leaf Meal	9.4	21.5	20.0	3.0	2.5	41.2	15.1	18.0	9.8	65	49,140	13.6
Green Acres Farms, Nazareth, Pa.												
Green Acres Brand Alfalfa Meal	10.3	17.9	17.0	2.2	2.0	33.5	23.5	27.0	1.6	26	19,656	—
D. Harbeck & Sons, New Bedford, Mass.												
Alfalfa Meal	17.0	16.8	—	1.4	—	34.0	23.6	—	7.2	31	23,436	17.4
Keystone Dehydrating Co., Nazareth, Pa.												
Super-Green Dehyd. Alfalfa Meal	6.5	16.5	17.0	2.0	2.0	40.6	26.8	25.0	7.6	38	28,728	13.6
Super-Green Dehyd. Alfalfa Meal	4.5	18.6	17.0	2.2	2.0	36.3	29.8	25.0	8.6	98	74,088	17.5
13% Fine Ground Alfalfa Meal	5.3	16.7	13.0	1.7	2.0	32.9	35.2	35.0	8.2	29	21,924	11.1
13% Fine Ground Alfalfa Meal	5.1	11.0	13.0	1.1	2.0	33.3	40.9	35.0	6.5	8	6,048	—
LeRoy Alfalfa Corp., LeRoy, N. Y.												
Dehydrated Alfalfa Meal	6.9	16.8	17.0	2.4	2.0	43.2	23.4	25.0	7.3	91	68,796	15.7
Dehydrated Alfalfa Meal	6.4	18.5	17.0	2.7	2.0	37.2	28.8	25.0	6.4	143	108,108	16.9
Meadow Brook Farms, Nazareth, Pa.												
Superior Alfalfa Meal	6.7	15.0	17.0	1.8	2.0	36.1	32.0	27.0	8.1	48	36,288	11.7
Superior Alfalfa Meal	6.7	14.9	17.0	2.3	2.0	35.5	31.6	27.0	9.0	134	101,304	13.6
Nationa. Alfalfa Co., Toledo, Ohio												
Dehydrated Alfalfa Meal	6.8	17.9	13.0	2.4	1.5	32.8	32.4	33.0	7.7	112	84,672	17.9

Alfalfa and Alfalfa Leaf Meal—continued

Manufacturer and Brand	Water %		Protein		Fat		Nitrogen Free Extract %		Fiber		Ash %	Carotene Parts per Million	Vitamin A Equivalent Units per Pound	Riboflavin Parts per Million
	Found %	Guaranteed %	Found %	Guaranteed %	Found %	Guaranteed %	Found %	Guaranteed %	Found %	Guaranteed %				
Neumond Co., St. Louis, Mo. 20% Delyd. Alfalfa Leaf Meal 20% Delyd. Alfalfa Leaf Meal	8.6	20.0	3.0	2.0	39.4	19.7	18.0	11.1	70	52,920	15.0			
	9.1	20.0	3.0	2.0	41.6	18.2	18.0	9.4	85	64,260	---			
Pecos Valley Alfalfa Mill Co., Chandler, Ariz. Peeve Alfalfa Leaf Meal Dehydrated	5.8	20.1	3.0	2.5	37.2	24.9	18.0	9.0	139	105,084	18.4			
Saunders Mills, Inc., Toledo, Ohio Carotene Brand Delyd. Alfalfa Leaf Meal Carotene Brand Delyd. Alfalfa Leaf Meal Carotene Brand Delyd. Alfalfa Leaf Meal Carotene Brand Delyd. Alfalfa Leaf Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal 20 Velvet Brand Alfalfa Meal	7.1	18.6	3.2	1.5	46.4	15.9	18.0	8.8	176	133,056	15.5			
	5.2	21.6	3.7	1.5	40.7	18.3	18.0	10.5	210	158,760	21.6			
	7.3	18.3	2.9	1.5	35.7	20.6	18.0	9.2	121	91,476	20.2			
	12.3	15.5	1.7	1.5	31.8	31.6	28.0	7.3	27	20,412	11.6			
	10.7	20.5	1.9	1.5	41.4	17.0	18.0	8.5	23	17,388	12.3			
	11.5	20.7	2.0	1.5	43.5	13.6	18.0	8.6	31	23,436	13.3			
	10.0	13.3	2.0	1.6	36.7	30.6	18.0	7.8	23	17,388	11.2			
	10.3	20.7	2.0	1.5	38.1	20.9	18.0	8.7	24	18,144	15.9			
	7.9	19.9	2.0	1.8	35.2	21.4	18.0	10.4	138	104,328	14.7			
	11.0	20.1	1.6	1.5	35.1	27.4	18.0	13.4	34	25,704	13.0			
	11.0	15.1	2.0	1.3	32.0	35.7	28.0	6.6	9	6,804	10.4			
	9.8	14.2	1.7	1.5	32.0	34.7	32.0	6.9	8	6,048	10.4			
	13.3	14.3	1.5	1.5	27.7	30.1	33.0	6.5	13	9,828	7.1			
	9.3	15.8	1.3	1.5	37.0	33.1	33.0	7.1	24	18,144	---			
	12.4	13.8	1.7	1.5	31.9	33.1	33.0	7.1	24	18,144	---			
Schoenck Farms, Inc., Nazareth, Pa. Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal Super-Green Delyd. Alfalfa Meal	6.8	19.6	3.0	2.0	36.9	22.4	20.0	11.3	86	65,016	15.6			
	7.6	16.2	2.4	2.0	38.3	25.8	20.0	9.7	80	60,480	13.9			
	3.6	20.8	2.0	2.0	34.9	25.7	20.0	11.8	230	173,880	15.6			
	9.5	18.8	2.0	2.0	31.7	27.2	20.0	10.6	119	89,964	---			
	6.7	18.0	2.6	2.0	35.3	28.5	25.0	8.9	99	74,844	13.8			
	4.2	17.0	2.1	2.0	39.5	29.3	25.0	7.8	38	28,728	14.0			
	6.7	16.3	1.7	2.0	38.2	26.6	25.0	9.6	72	54,432	15.0			
	7.9	17.2	2.6	2.0	34.7	29.5	25.0	7.9	111	83,916	15.6			
	4.0	17.8	2.7	2.0	38.3	29.6	25.0	7.6	60	45,360	13.0			
	4.6	17.6	2.1	2.0	37.9	28.3	25.0	9.5	71	53,676	15.7			
	6.8	17.5	1.7	2.0	34.4	29.0	25.0	9.4	69	52,164	11.6			
	7.0	17.0	2.3	2.0	37.0	28.3	25.0	9.4	69	52,164	11.6			
	16.6	16.6	1.8	2.0	34.5	32.4	25.0	7.7	44	33,264	12.6			

W. J. Small Co., Inc., Neodesha, Kan.																						
Dehydrated Alfalfa Leaf Meal	6.3	22.2	20.0	3.5	2.5	40.7	17.2	18.0	10.1	180	136,080	20.5										
Dehydrated Alfalfa Leaf Meal	9.3	20.9	20.0	3.2	2.5	35.8	19.2	18.0	11.6	132	99,792	20.6										
Dehydrated Alfalfa Leaf Meal	6.8	22.1	20.0	3.2	2.5	39.8	17.9	18.0	10.2	135	102,060											
17% Dehydrated Alfalfa Meal	7.9	18.6	17.0	2.8	1.8	35.8	24.5	27.0	10.4	97	73,352	13.6										
Tremaine Alfalfa Milling Co., Mesa, Ariz.																						
Arizona Brand Alfalfa Leaf Meal	7.8	21.1	20.0	2.5	2.5	37.9	20.0	18.0	10.7	91	68,796	—										
Trexler Farms, Allentown, Pa.																						
Buffalo Brand 17% Fancy Fine Ground Dehydrated Alfalfa Meal	6.2	17.0	17.0	2.5	2.0	38.6	28.8	27.0	6.9	114	86,184	17.2										
Buffalo Brand 17% Fancy Fine Ground Dehydrated Alfalfa Meal	6.1	16.4	17.0	2.6	2.0	37.2	30.1	27.0	7.6	80	60,048	17.2										
Buffalo Brand 17% Fancy Fine Ground Dehydrated Alfalfa Meal	4.3	18.1	17.0	2.2	2.0	37.1	30.3	27.0	8.0	53	40,068	14.6										
Buffalo Brand 17% Fancy Fine Ground Dehydrated Alfalfa Meal	6.3	19.0	17.0	2.4	2.0	35.6	29.4	27.0	7.3	96	72,576	12.8										
Buffalo Brand 15% Choice Fine Ground Dehydrated Alfalfa Meal	5.4	15.7	15.0	2.1	2.0	38.5	31.3	30.0	7.0	30	22,680	15.4										

Animal and Fish Products

In these tables are presented not only the usual analyses but determinations of oleic acid, riboflavin and the protein quality index as well.

Oleic acid is, within limits, a measure of decomposition and may indicate the condition of the material before it is processed. Some feed manufacturers place dependence on the test as the basis of acceptance of the products they purchase for use in their mixtures and reject any shipment containing 1% or more of oleic acid. With the present scarcity of meat and fish products it is quite possible that this organic acid test is not so generally used.

Meat and fish products are only fair sources of riboflavin and with the proportion used in poultry mixtures cannot be depended upon to furnish an adequate supply. The exceptions are the fish and liver meals and possibly crab meal.

Salt was not found in excessive amount in any of the samples analyzed. The higher percentages would not prove of serious consequence when diluted by the other ingredients of a mixed ration.

The protein quality index indicates production value. It is determined by chemically breaking up the complex substance known as protein into several parts, all of which vary in nutritive value. The results obtained are subjected to a formula which gives the figures known as the protein quality index. The index does not show the actual value in terms of percentage, but is simply a comparative figure. However, it has been shown to correspond closely to the values obtained in feeding trials with chicks. It is stated on authority that a meat and bone scrap of excellent quality should have an index value of 70 to 75. Highest grade fish meals should run as high as 80 to 87.

The index value is also given for several fish products not usually found in the market. These were obtained from private sources. All of them indicate value and they should receive favorable consideration as substitutes for the better grades of fish meal during the present scarcity. The index for shrimp meal is probably too low. It is an average figure obtained from several samples dried by different methods.

Animal Products

Manufacturer and Brand	Water %	Protein		Fat		Ash %	Salt %	Oleic Acid %	Riboflavin Parts per Million	Protein Quality Index
		Found %	Guar- anteed %	Found %	Guar- anteed %					
Consolidated Rendering Co., Boston, Mass.										
Corenco 55% Meat Scrap	7.1	57.5	55.0	10.7	6.0	22.1	1.2	1.0	8.2	67
Corenco 50% Meat Scrap	6.2	47.3	50.0	11.5	6.0	32.7	2.1	0.7	7.3	72
Corenco 50% Meat Scrap	5.4	49.2	50.0	11.2	6.0	32.3	1.1	0.8	6.2	65
Corenco 45% Meat Scrap	6.4	41.4	45.0	11.2	6.0	39.0	1.3	0.7	5.0	70
Corenco 45% Meat Scrap	8.6	42.6	45.0	8.2	6.0	39.0	0.4	0.4	—	84
Jas. F. Morse & Co., Somerville, Mass.										
Morse's 45% Meat & Bone Scrap	5.7	44.6	45.0	9.0	8.0	38.3	1.0	0.6	5.1	64
John Reardon & Sons, Cambridge, Mass.										
Register Brand 50% Meat and Bone Scrap	7.1	50.4	50.0	10.8	8.0	27.1	1.2	1.9	9.1	66
Register Brand 50% Meat and Bone Scrap	6.2	51.4	50.0	12.5	8.0	26.6	1.4	1.8	5.6	65
Register Brand 50% Meat and Bone Scrap	5.6	51.3	50.0	10.9	8.0	28.7	0.9	1.3	7.0	59
Register Brand 45% Meat and Bone Scrap	6.3	43.9	45.0	10.5	8.0	36.4	1.0	2.7	8.8	53
Register Brand 45% Meat and Bone Scrap	5.7	49.0	45.0	10.3	8.0	31.5	1.2	3.4	7.7	63
Register Brand 45% Meat and Bone Scrap	3.4	42.8	45.0	13.3	8.0	37.9	1.9	2.0	4.4	64
Register Brand 45% Meat and Bone Scrap	4.7	45.4	45.4	14.1	8.0	32.3	1.5	2.3	8.7	65
Register Brand 45% Meat and Bone Scrap	7.5	43.7	45.0	11.1	8.0	35.3	0.8	1.8	5.4	71
Register Brand 45% Meat and Bone Scrap	5.0	52.2	45.0	12.1	8.0	27.2	1.2	3.0	—	67
Rearco 72 Feeding Bone	4.9	4.9	5.0	7.1	—	79.5	—	—	—	71
Rearco Animal Liver Meal	8.6	65.6	65.0	13.7	—	7.9	0.5	4.8	60.4	82
Rearco Animal Liver Meal	9.4	64.4	65.0	14.7	—	8.9	1.0	6.8	35.7	74
H. M. Rubin Co., Long Island City, N. Y.										
Rubco Meat & Bone Scrap	7.2	50.7	50.0	8.3	5.0	31.0	1.2	0.6	4.9	71
Unknown										
Argentine Liver Meal	7.5	63.3	—	21.8	—	5.6	0.7	2.7	34.8	72

Fish Products

Manufacturer and Brand	Water %	Protein		Fat		Ash %	Salt %	Oleic Acid %	Riboflavin Parts per Million	Protein Quality Index
		Found %	Guar- anteed %	Found %	Guar- anteed %					
Consolidated Rendering Co., Boston, Mass.										
Corenco Cod and Haddock Meal	9.1	59.4	62.0	8.2	2.0	24.1	1.9	1.8	8.7	63
Corenco Cod and Haddock Meal	11.1	59.8	62.0	8.6	2.0	20.6	1.8	2.0	12.6	66
Corenco Cod and Haddock Meal	12.6	61.5	62.0	6.9	2.0	19.9	1.5	2.7	9.4	72
Gorton-Pew Fisheries, Ltd., Gloucester, Mass.										
Gorton's Codliver Meal Blend	6.5	45.3	50.0	28.0	15.0	7.1	1.0	15.5	23.5	50
Gorton's Red Fish Meal	6.4	56.6	55.0	8.8	5.0	26.6	1.2	0.9	8.5	78
Gorton's Red Fish Meal	7.2	55.7	55.0	7.8	5.0	26.6	1.1	0.4	9.3	80
Gorton's Red Fish Meal	5.8	57.6	55.0	9.1	5.0	26.6	1.2	0.3	8.5	79
Gorton's Red Fish Meal	5.1	59.4	55.0	8.7	5.0	26.5	1.1	0.4	—	80
Maine Fish Meal Co., Portland, Maine										
Maine Vitamin D Concentrate	8.6	53.8	55.0	19.0	10.0	17.5	5.6	1.0	7.9	75
Maine Vitamin D Concentrate	8.8	54.0	55.0	17.7	10.0	19.5	6.5	1.1	6.5	78
Maine Vitamin D Fish Meal	8.7	54.8	55.0	16.0	10.0	19.0	6.5	1.2	8.7	68
John Kcardon & Sons, Cambridge, Mass.										
Register Brand White Fish Meal	11.3	60.8	62.0	6.8	3.0	20.4	1.7	1.1	12.7	73
Register Brand White Fish Meal	11.5	63.4	62.0	7.0	3.0	15.8	3.9	0.6	5.8	78
Register Brand White Fish Meal	10.9	63.5	62.0	8.0	3.0	16.9	3.9	0.7	5.8	82
Register Brand White Fish Meal	11.5	63.5	62.0	10.8	3.0	13.6	2.7	0.6	6.9	81
Register Brand White Fish Meal	11.6	62.8	62.0	7.4	3.0	16.6	4.3	0.8	5.8	82
From Private Sources										
Unscreened Crab Meal	7.6	33.5	—	2.7	—	37.5	—	—	16.0	60
Screened Crab Meal	5.4	28.8	—	1.3	—	45.1	—	—	14.4	57
Red Fish Meal	—	53.9	—	—	—	—	—	—	—	54
Red Fish Meal	—	53.0	—	—	—	—	—	—	—	61
Shrimp Meal	—	48.5	—	—	—	—	—	—	—	43
Shark Meal	—	94.7	—	—	—	—	—	—	—	04
Star Fish	3.0	33.6	—	7.7	—	41.7	—	—	8.9	65

Milk Products

Manufacturer and Brand	Water %	Protein		Fat		Lactose %	Ash %	Riboflavin Parts per Million
		Found %	Guar- anteed %	Found %	Guar- anteed %			
Herbert K. Cloline, Philadelphia, Pa. Supreme Brand Dried Skimmilk	4.3	35.5	32.0	1.3	0.25	50.8	8.1	22.4
Dairymen's League Co-Operative Association, Inc., Ulica, N. Y. Darylect Dried Skimmilk	4.7	33.6	33.0	2.3	0.5	51.3	8.1	19.9
Fergus Co-operative Creamery Association, Fergus Falls, Minn. Buttermilk Powder	9.9	29.5	28.0	4.9	5.0	—	10.0	25.9
New England Dairies, Inc., Charlestown, Mass. Skimmilk Powder	7.6	36.5	32.0	0.8	0.025	47.1	8.0	26.7
Producers Creamery Co., Cabool, Mo. Land-O-Smiles Dried Skimmilk	6.7	34.3	32.0	1.0	0.25	50.1	7.9	20.8
United Farmers Co-operative Creamery Association, Inc., Morrisville, Vt. Dried Skimmilk	6.6	34.5	32.0	0.9	0.5	50.2	7.8	23.7
Dried Skimmilk	7.3	32.9	32.0	0.9	0.5	51.1	7.8	22.2
Ward Milk Products Div., Kraft Cheese Co., Chicago, Ill. Dried Whey (Feeding)	7.3	12.6	10.5	1.8	1.0	70.1	8.2	25.9
Collis Dried Buttermilk (Feeding)	7.1	30.0	30.0	4.3	5.0	—	8.2	33.4
Western Condensing Co., San Francisco, Cal. Peebles Lact-G Dried Whey	7.2	12.7	12.0	0.5	0.5	70.5	9.1	24.8

The milk products examined consisted for the most part of dried skim and butter milk. All possess a high nutritive value in addition to being excellent sources of riboflavin. The dried wheys contain more milk sugar than the dried milks as the protein (casein) has been so largely removed.

Miscellaneous

Manufacturer and Brand	Water %	Protein		Fat		Nitro- gen Free Extract %	Fiber		Ash %	Riboflavin Parts per Million
		Found %	Guar- anteed %	Found %	Guar- anteed %		Found %	Guar- anteed %		
Borden Co., New York, N. Y.										
Ration Ayd 85	9.5	35.4	32.0	3.8	0.5	36.5	3.1	4.25	11.7	20.5
Ration Ayd 160	8.1	37.1	32.0	5.5	0.5	37.9	3.8	4.25	7.6	11.8
Flaydry	7.3	37.2	24.0	2.9	0.5	38.5	4.3	4.25	9.8	13.4
Flaydry	6.7	36.3	24.0	2.9	0.5	40.7	4.4	4.25	9.0	11.1
Flaydry	9.0	29.6	24.0	2.5	0.5	33.9	3.6	4.25	21.4	8.9
Cerophyl Laboratories, Inc., Kansas City, Mo.										
*Dried Greens Buttermilk	6.8	21.2	20.0	4.9	4.0	36.0	17.4	19.0	13.7	16.2
Commercial Solvents Corp., Peoria, Ill.										
B-Y Riboflavin Supplement	5.6	30.8	—	1.1	—	55.3	1.8	—	10.5	252.0
B-Y Riboflavin Supplement	4.8	30.8	—	0.8	—	50.9	2.3	—	10.4	262.0
B-Y Riboflavin Concentrate	5.5	25.0	—	0.3	—	57.4	0.6	—	11.2	95.0
Dawes Products Co., Chicago, Ill.										
Flavonne	8.0	34.9	31.0	3.3	4.0	44.3	3.7	5.0	5.8	16.7
Egg-O-Milk Co., Baltimore, Md.										
Egg-O-Milk Co.'s Blend	11.2	38.1	32.0	2.4	1.5	41.2	2.3	4.0	4.8	3.9
Egg-O-Milk Co.'s Blend	11.1	35.6	32.0	1.8	1.5	42.9	3.8	4.0	1.8	4.5
Egg-O-Milk Co.'s Blend	11.0	36.7	32.0	1.9	1.5	41.8	3.7	4.0	4.9	3.9
C. J. Martenis Grain Co., New York, N. Y.										
Alco Malt Sprouts	10.8	28.0	24.0	1.5	0.5	39.8	13.3	15.0	6.6	11.0
National Distillers Products Corp., New York, N. Y.										
Produlac Dried Distillers Corn Grains with Solubles	9.5	27.4	27.0	8.8	8.0	43.6	6.4	9.0	4.3	5.9
Produlac Dried Distillers Corn Grains with Solubles	5.5	29.8	27.0	8.5	8.0	43.9	8.3	9.0	4.0	4.0
Produlac Dried Distillers Corn Grains with Solubles	8.4	27.9	27.0	8.6	8.0	42.4	8.8	9.0	3.9	4.6
Pablocker, Inc., Philadelphia, Pa.										
Paco Riboflavin Concentrate	7.9	25.6	20.0	0.4	—	56.4	0.3	—	9.4	71.7
Whitmoyer Laboratories, Myerstown, Pa.										
Flav A Dee 60	9.3	24.2	17.0	23.9	21.0	27.9	8.7	5.0	6.0	37.4

*Carotene 285 parts per million

In the foregoing table are listed products sold primarily as riboflavin sources, others which furnish not only riboflavin but other vitamins as well, and a few examined merely to determine how much riboflavin might be present. Where the riboflavin content was guaranteed, the guarantee was in no instance overstated.

Directory of Manufacturers Who Registered Feeding Stuffs for Sale in Massachusetts in 1943

- Albers Milling Co., Seattle, Wash.
Allied Mills, Inc., Chicago, Ill.
American Maize-Products Co., 100 East 42nd St., New York, N. Y.
A. P. Ames & Co., 10 Walnut St., Peabody, Mass.
Archer-Daniels-Midland Co., Minneapolis, Minn.
Ashcraft-Wilkinson Co., Trust Company of Georgia Bldg., Atlanta, Ga.
Atkinson Milling Co., 900 Flour Exchange Minneapolis, Minn.
W. E. Atkinson Co., 27 Water St., Newburyport, Mass.
Atlantic Supply Co., 1000 Hull St., Baltimore, Md
Bay State Milling Co., Winona, Minn.
Beacon Milling Co., Inc., Cayuga, N. Y.
Best Foods, Inc., Buffalo, N. Y.
Bisbee Linseed Co., Inc., Amsterdam, N. Y.
Blatchford Calf Meal Co., Waukegan, Ill.
Borden Co., 350 Madison Ave., New York, N. Y.
Borden Grain Co., West Water St., Taunton, Mass.
A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America)
George B. Brown Corporation, Ipswich, Mass.
Buckeye Cotton Oil Co., Cincinnati, Ohio
A. B. Caple Co., Toledo, Ohio.
Center Milk Products Co., Middlebury Center, Penn. (Registered also for Vita-Lac Co.)
Central Soya Co., Inc., Decatur, Ind.
S. J. Cherry & Sons, Ltd., Preston, Ont., Canada
Clinton Co., Clinton, Iowa.
Coatsworth and Cooper Ltd., 67 Yonge St., Toronto, Ont., Canada
Commander-Larabee Milling Co., Minneapolis, Minn.
Community Service, Inc., Canaan, Conn.
Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
Continental Distilling Corporation, 1429 Walnut St., Philadelphia, Penn.
O. A. Cooper Co., Humboldt, Neb.
Corn Products Sales Co., 17 Battery Place, New York, N. Y.
Nicolas Courcy, 12 Waverly St., Taunton, Mass.
Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
Chas. M. Cox Co., 177 Milk St., Boston, Mass.
Dailey Mills, Inc., Binghamton, N. Y.
Dairymen's League Co-operative Association, Inc., 11 West 42nd St., New York, N. Y.
Decatur Milling Co., Inc., Decatur, Ill.
Dehydrating Process Co., 60 Mt. Washington Ave., Boston, Mass.
Delaware Mills, Inc., 88 Front St., Deposit, N. Y.
Denver Alfalfa Milling & Products Co., Lamar, Col.
Frank Diauto, 87 Warren St., Randolph, Mass.
F. Diehl & Son, Inc., Wellesley, Mass.
Dietrich & Gambrill, Inc., Frederick, Md.
Drackett Products Co., 5020 Spring Grove Ave., Cincinnati, Ohio.
Dreyer Commission Co., St. Louis, Mo.
Eagle Roller Mill Co., New Ulm, Minn.
East Bridgewater Farmers Cooperative Exchange, East Bridgewater, Mass.
Eastern Grain Co., Bridgewater, Mass.
Eastern States Farmers' Exchange, West Springfield, Mass.
B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago, Ill.
Economy Grocery Stores Corporation, 393 D St., Boston, Mass.
Egg-O-Milk Co., Baltimore, Md. (Registered by P. Fred'k Obrecht & Son)
M. W. Ellis Estate, 19 Walnut St., Peabody, Mass.
Elmore Milling Co., Inc., Oneonta, N. Y.

John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Cooperative Farming Association, Topsfield, Mass.
 Evans Milling Co., Indianapolis, Ind.
 Excelsior Milling Co., Minneapolis, Minn.
 George A. Fair, Holliston, Mass.
 Farmers Feed Co., 532 East 76th St., New York, N. Y.
 Farmers Service Bureau, Monument & Haven Streets, Baltimore, Md.
 Federal Mill, Inc., Lockport, N. Y.
 Ferneau Grain Co., Blanchester, Ohio
 Finger Lakes & Hudson Flour Mills, Inc., 7-9 Madison St., Troy, N. Y.
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Flory Milling Co., Inc., Bangor, Penn.
 Fred A. Fountain, Taunton, Mass.
 Paul Fuller & Son, 8 Mooney Ave., Salem, Mass.
 J. B. Garland & Son, Inc., 15 Grafton St., Worcester, Mass.
 General Foods Corporation, Battle Creek, Mich.
 General Foods Corporation, Corn Mill Division, Kankakee, Ill.
 General Mills, Inc., Minneapolis, Minn.
 General Mills, Inc., Farm Service Division, Fitchburg, Mass.
 General Mills, Inc., Larrowe Division, Detroit, Mich.
 Getek Industrial & Agricultural Supplies Corporation, 1270 Sixth Ave., New York, N. Y.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Gilster Milling Co., Chester, Ill.
 Glidden Company Feed Mill Division, 1160 West 18th St., Indianapolis, Ind.
 Glidden Co., Soya Products, Division, 5165 West Moffat St., Chicago, Ill.
 Gloucester Dehydrating Process Co., Gloucester, Mass.
 Goode Grain Co., 452 Broadway, Lowell, Mass.
 Gorton-Pew Fisheries Co., Ltd., 327 Main St., Gloucester, Mass.
 Grande Isle County Co-operative Creamery Association, Inc., Grand Isle, Vt.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., New York, N. Y.
 Great Eastern Feed Mills, Phoenix Ave., Lowell, Mass., (Registered by Wilmington Packing Co.)
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.
 Wm. Hamilton & Son, Inc., Caledonia, N. Y.
 D. Harbeck & Sons, New Bedford, Mass.
 Henkel Flour Mills, 323 East Atwater St., Detroit, Mich.
 Hercules Powder Co., Dairy Products Division, 332 South Michigan Ave., Chicago, Ill.
 D. B. Hodgkins' Sons, Gloucester, Mass.
 E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
 Horton Grain Co., Ipswich, Mass.
 Horvitz Feed Co., New Bedford, Mass.
 Hubinger Co., Keokuk, Iowa
 Humpreys-Godwin Co., Memphis, Tenn.
 Illinois Cereal Mills, Inc., Paris, Ill.
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.
 International Milling Co., Minneapolis, Minn.
 Ismert-Hincke Milling Co., Kansas City, Mo.
 Jaquith & Co., 305 Main St., Woburn, Mass.
 Kansas Flour Mills Co., Kansas City, Mo.
 Kasco Mills, Inc., Waveley, N. Y.
 Kellogg Co., Battle Creek, Mich.
 Spencer Kellogg and Sons, Inc., 98 Delaware Ave., Buffalo, N. Y.
 King Midas Flour Mills, 500 Flour Exchange, Minneapolis, Minn.
 Kinsey Distilling Corporation, 1429 Walnut St., Philadelphia, Penn.
 Chas. A. Krause Milling Co., Milwaukee, Wis.
 Lake of the Woods Milling Co., Ltd., Montreal, Que., Canada
 J. T. Lampman & Co., Claverack, N. Y.
 Larabee Flour Mills Co., Kansas City, Mo.
 L. B. Lovitt & Co., Memphis, Tenn.
 Maine Fish Meal Co., Union Wharf, Portland, Maine
 Mansfield Milling Co., Mansfield, Mass.
 Maritime Milling Co., Inc., Buffalo, N. Y.
 C. J. Martens Grain Co., Produce Exchange Bldg., New York, N. Y.
 Meadow Brook Farms, Nazareth, Penn.
 Mellin's Food Company of North America, 41 Central Wharf, Boston, Mass. (Registered for
 A. H. Brown & Bros.)
 Merrimack Farmers' Exchange, Inc., Concord, N. H.

Middlesex County Farm Bureau Association, Waltham, Mass.
 Miller Cereal Mills, Omaha, Neb.
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.
 Geo. Q. Moon & Co., Inc., Binghamton, N. Y.
 Moore-Lowry Flour Mills Co., 1065 Board of Trade Bldg., Kansas City, Mo.
 Jas. F. Morse & Co., 11 Horace St., Somerville, Mass.
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.
 National Distillers Products Corporation, 120 Broadway, New York, N. Y.
 National Foods, Feed Division, Baltimore, Md.
 National Lead Co., 111 Broadway, New York, N. Y.
 National Milling Branch of National Biscuit Co., Toledo, Ohio
 Neumond Co., St. Louis, Mo.
 New England Dairies, Inc., Charlestown, Mass.
 New England Grain Co., 390 Commercial St., Portland, Maine.
 New England Rendering Co., Brighton, Mass.
 New England Retail Grain Dealers Cooperative Association, Inc., Springfield, Mass.
 P. Fred'k. Obrecht & Son, 4101 East Monument St., Baltimore, Md. (Registered for Egg-O-Milk Co.)
 Oeden Grain Co., Utica, N. Y.
 Ogilvie Flour Mills Co., Ltd., Montreal, Que., Canada
 Pabst Brewing Co., Milwaukee, Wis.
 Palm Grain Co., 1081 Gorham St., Lowell, Mass.
 Park & Pollard Co., Inc., 356 Heitel Ave., Buffalo, N. Y.
 George H. Parker Grain Co., 56 Water St., Danvers, Mass.
 Patent Cereals Co., Geneva, N. Y.
 Pillsbury Flour Mills Co., Minneapolis, Minn.
 Pittsburgh Plate Glass Co., Linseed Oil Division, 2-10 Chester Ave., Newark, N. J.
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.
 Pratt Food Co., Inc., 69 Leddy St., Buffalo, N. Y.
 Publicker Commercial Alcohol Co., 1429 Walnut St., Philadelphia, Penn.
 Publicker Inc., 1429 Walnut St., Philadelphia, Penn.
 H. C. Puffer Co., Springfield, Mass. (Business sold May 1)
 Quaker Oats Co., 141 West Jackson Blvd., Chicago, Ill.
 Ralston Purina Co., St. Louis, Mo.
 John Reardon & Sons Division of Wilson & Co., Inc., Cambridge, Mass.
 Rodney Milling Co., Kansas City, Mo.
 Russell-Miller Milling Co., Minneapolis, Minn.
 Ryther & Warren Co., Belchertown, Mass.
 St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame Street West, Montreal, Que., Canada
 Saunders Mills, Inc., Box 1584 Central Station, Toledo, Ohio
 Schenley Distilleries, Inc., 350 Fifth Ave., New York, N. Y.
 Schoeneck Farms, Inc., Nazareth, Penn.
 Joseph E. Seagram & Sons, Inc., Louisville, Ky.
 Shellabarger Mill & Elevator Co., Salina, Kan.
 Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio
 W. J. Small Co., Inc., Neodesha, Kan.
 A. E. Staley Manufacturing Co., Decatur, Ill.
 Standard Milling Co., 309 West Jackson Blvd., Chicago, Ill.
 Stratton & Co., Concord, N. H.
 Sunny Slope Farms, Nazareth, Penn.
 Swift & Company, Finney St., Palmer, Mass.
 Swift & Company Soybean Mills, Champaign, Ill.
 Toledo Soybean Products Co., Toledo, Ohio
 Jacob Trinley & Sons, Linfield, Penn.
 Union Sales Corporation, Columbus, Ind. (Distributor for Union Starch & Refining Co.)
 United Cooperative Farmers, Inc., Fitchburg, Mass.
 United Farmers Cooperative Creamery Association, Inc., Charlestown, Mass.
 United Mills Co., Inc., Grafton, Ohio
 Unity Feeds, Inc., 177 Milk St., Boston, Mass.
 Valier & Spies Milling Co., St. Louis, Mo.
 Arthur Ventura Grain Co., 7 Purchase St., Taunton, Mass.
 Victor Flour Mills, Inc., Pittsford, N. Y.
 Vita-Lac Co., Middlebury Center, Penn. (Registered by Center Milk Products Co.)
 Wakefield Sawdust & Shavings Co., Wakefield, Mass.
 Hiram Walker & Sons, Inc., Foot of Edmund St., Peoria, Ill.
 Wamesit Co., Wamesit (Tewksbury), Mass. (Registered by Wilmington Packing Co.)
 Ward Milk Products Division of Kraft Cheese Co., 500 Pestigo Ct., Chicago, Ill.
 C. P. Washburn Co., Middleboro, Mass.

Wayne County Grangers Feed Corporation, Clyde, N. Y.
H. K. Webster Co., Lawrence, Mass.
Western Condensing Co., Petaluma, Cal.
Whitmoyer Laboratories, Inc., Myerstown, Penn.
Williams Bros. Co., Kent, Ohio
Est. M. G. Williams, Taunton, Mass.,
Wilmington Packing Co., New Boston St., Woburn, Mass. (Registered also for Great Eastern Feed
Mills, and Wamesit Co.)
Wilson & Co., Inc., 4100 South Ashland Ave., Chicago, Ill.
Stanley Wood Grain Co., Taunton, Mass.
Worcester Grain & Coal Co., Worcester, Mass.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 118

SEPTEMBER 1943

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventieth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Section 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

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INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1943

By Fertilizer Control Service Staff:

Philip H. Smith, Official Chemist, in Charge
John W. Kuzmeski, Senior Chemist
*H. Robert DeRose, Assistant Chemist
Albert F. Spelman, Assistant Chemist
C. Tyson Smith, Assistant Chemist
Leo V. Crowley, Junior Chemist
*On military leave of absence.

James T. Howard, Inspector
Louis A. Graves, Inspector
Joseph A. Bartl, Inspector
Joseph A. Martell, Laboratory
Assistant
Cora B. Grover, Senior Clerk

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesia.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes

Tonnage reports are required semi-annually, on January 1 and July 1.

Tonnage fee: 6 cents per ton of 2,000 pounds.

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

PHILIP H. SMITH
Massachusetts Agricultural Experiment Station
Amherst, Mass.

Manufacturers and Brands

Registrations have been perfected in Massachusetts during 1943 by 65 firms, covering 257 brands of mixed fertilizer and unmixed fertilizing materials.

The following brands were not found on display by the sampling agent at any point in the state and therefore do not appear in the tables of analyses.

Brands of Fertilizer Registered but Not Sampled

Acme Guano Co. Acme 4-9-7 Acme 4-12-4	Chilean Nitrate Sales Corporation Chilean Nitrate of Soda—Original Old Style (16-0-0)
Allied Chemical & Dye Corporation The Barrell Division Sulphate of Ammonia (20.6-0-0)	Consolidated Rendering Co. Coreno 0-20-20 Hay & Pasture Coreno 4-16-20 Seeding Special Coreno 10-6-4
American Cyanamid Co. 21% Aero Cyanamid Pulverized (21 0-0)	Eastern States Farmers' Exchange Eastern States 5-10-10-1.5 Eastern States 5-17-0 Eastern States 6-12-6-0.5 Eastern States 8-8-8
American Potash & Chemical Corp. Tiona Muriate of Potash (0-0-60)	Hartney & Amalia, Inc. Vitafood 7-7-6
Apothecaries Hall Co. Liberty Fertilizer 0-14-14 Cotton Hull Ashes (0-0-25) Muriate Potash 60% (0-0-60) Sulphate Potash (0-0-48) Sulphate Ammonia (20.5-0-0)	Humphreys-Godwin Co. Dixie Brand 41% Prime Cottonseed Meal (6.58-0-0)
Archer-Daniels-Midland Co. Archer Brand 32 Per Cent Protein Old Process Linseed Oil Meal (5-0-0)	Hyper-Humus Co. Hyper-Humus (4-0-0)
Armour Fertilizer Works Armour's Big Crop Fertilizer 3-10-10	Ruhm Phosphate & Chemical Co. Red Seal Brand Ruhm's Phosphate Rock 30% (0-30-0)
Ashcraft-Wilkinson Co. Fertilizer Compound (34-0-0)	O. M. Scott & Sons Co. Scotts Turf Builder 8-7-3 (2% organic nitrogen)
Baugh & Sons Co. Baugh's Premium Plant Food & Soil Builder 3-12-6 Baugh's Premium Plant Food & Soil Builder 4-10-10 Baugh's Victory Garden Fertilizer 3-8-7 Baugh's 20% Superphosphate (0-20-0)	Sears, Roebuck & Co. Garden Master Plant Food 3-8-7
Berkshire Chemical Co. Berkshire 0-14-14	Swift & Company Fertilizer Works Swift's Red Steer 3-12-6 Swift's Red Steer 4-9-7 Swift's Red Steer 4-10-10 Swift's Red Steer Superphosphate (0-20-0) Swift's Pulverized Cattle Manure (1.85-0.75-1.50)
Buell Fertilizer Co. Buell Peat-Poultry Manure (3-3-1.5)	Universal Chemical Co. Electra Plant Food 4-12-4

Drawing of Samples

Between April 1 and June 15, three sampling agents made a thorough canvass of the state: James T. Howard in Hampshire, Hampden, Franklin, and Berkshire Counties; Louis A. Graves in Norfolk, Bristol, Plymouth, Barnstable, and Dukes Counties; and Joseph A. Bart in Essex, Middlesex, Suffolk, and Worcester Counties. They visited 151 towns, took 1,176 samples, representing 220 brands, from stock in the possession of 332 agents or owners, and called at 307 places where no samples were drawn because the agency had been discontinued, the stock was all sold out, or sufficient samples had already been taken of the brands found. They sampled 16,686 sacks, representing 8,739 tons of fertilizer. One ton was sampled to every eight and nine-tenths tons sold in the state.

FERTILIZER TONNAGE

Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts

	July 1, 1940, to July 1, 1941	July 1, 1941, to July 1, 1942	July 1, 1942, to July 1, 1943
Mixed fertilizers	46,212	53,602	62,989 <i>c</i>
Fertilizer chemicals and materials unmixed	18,613 <i>a</i>	15,470 <i>b</i>	13,219 <i>d</i>
Pulverized animal manures	1,414	1,508	1,596
Totals	66,239	70,580	77,804

a Does not include 9,192 tons of 20% superphosphate distributed by the A.A.A.

b Does not include 1,604 tons of 18% superphosphate and 8,394 tons of 20% superphosphate distributed by the A.A.A.

c Does not include 2,916 tons of 0-14-14 distributed by the A.A.A.

d Does not include 8,505 tons of 20% superphosphate distributed by the A.A.A.

Tonnage of Mixed Fertilizers, July 1, 1942 to July 1, 1943.

Grade*	Tonnage	Brands	Grade*	Tonnage	Brands
4-9-7	16,084	19	6-12-8	47	—
4-10-10	15,476	26	4-8-7	46	—
3-8-7	11,128	20	7-7-7	41	—
6-3-6	5,966	11	3-10-6	38	—
3-12-6	3,769	16	4-1-2	38	—
6-15-15	2,693	6	10-6-4	37	—
4-12-4	2,551	19	3-10-4	31	—
0-14-14	862	8	3-10-10	30	—
5-8-7	809	—	8-5-2	28	—
6-8-4	350	—	5-8-10	22	—
4-16-20	342	—	8-6-6	19	—
4-8-4	328	—	10-10-10	17	—
5-3-5	317	—	8-16-16	16	—
4-8-10	226	—	6-12-12	13	—
3-10-5	223	—	7-5-3	13	—
5-10-10	163	—	7-7-5	13	—
5-6-4	154	—	7-7-6	13	—
4-9-3	150	—	5-5-15	12	—
3-10-3	116	—	8-16-14	12	—
8-4-8	115	—	5-5-10	11	—
5-5-5	98	—	8-6-4	11	—
5-10-5	97	—	Miscellaneous	106	15
5-10-4	93	—	Special Mixtures	96	—
0-20-20	88	—	TOTALS	62,989	167
8-6-2	81	—			

*The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Fertilizing Materials, July 1, 1942, to July 1, 1943

Material	Tonnage	Brands	Material	Tonnage	Brands
Nitrate of soda	3,144	—	Linseed meal	57	—
Superphosphate 20%	2,785	12	Superphosphate 16%	56	—
Milorganite	1,743	—	Superphosphate 47%	43	—
Pulverized animal manures	1,596	23	Rock phosphate	30	—
Superphosphate 18%	1,577	—	Peat	29	—
Bone meal	1,141	14	Sulfate of potash	19	—
Cottonseed meal	801	—	Tankage	7	—
Muriate of potash 60%	671	8	Fish meal	6	—
Cyanamid	512	—	Castor pomace	6	—
Sulfate of ammonia	350	6	Urea	5	—
Muriate of potash 50%	101	—	Miscellaneous	12	—
Bone and tankage	72	—	TOTALS	14,815	60
Cotton hull ashes	61	—			

MIXED FERTILIZERS
Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
Acme Guano Co.	3	2	9	0	0	0	1
American Agricultural Chemical Co.	82	18	240	41	14	12	17
Apothecaries Hall Co.	19	18	57	0	1	0	0
Armour Fertilizer Works	30	6	88	26	6	2	1
Ernest J. Bantle	2	2	6	0	0	0	0
F. A. Bartlett Tree Expert Co.	1	1	3	0	0	0	0
Baugh & Sons Co.	3	3	9	0	0	0	0
Berkshire Chemical Co.	14	2	42	10	4	1	1
Joseph Breck & Sons	5	1	15	2	2	1	1
Consolidated Rendering Co.	38	23	112	10	5	4	0
Eastern States Farmers' Exchange	24	15	88	8	2	1	0
Thomas W. Emerson Co.	4	0	12	0	1	1	4
Essex County Co-operative Farming Association	2	2	7	0	0	0	0
Excell Laboratories	1	1	3	0	0	0	0
H. L. Frost & Higgins Co.	2	0	6	2	0	0	0
Goulard & Olena, Inc.	1	0	3	0	0	0	1
Grasalo Co.	2	1	6	0	0	1	1
Greenlands Services, Inc.	1	1	3	0	0	0	0
Henderson & Herndon Tree Co., Inc.	1	1	3	0	0	0	0
Hydroponic Chemical Co., Inc.	2	2	6	0	0	0	0
Hy-Trous Corporation	2	2	6	0	0	0	0
International Minerals & Chemical Corporation	35	14	102	15	8	1	2
Mechling Bros. Chemicals, Division of General Chemical Co.	2	2	6	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	24	19	74	4	1	0	0
Olds & Whipple, Inc.	16	14	48	1	1	0	0
Plantabbs Co.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	46	37	137	5	2	0	2
William H. Rorer, Inc.	1	1	3	0	0	0	0
O. M. Scott & Sons Co.	4	2	12	1	3	0	0
M. L. Shoemaker Division, Wilson & Co., Inc.	1	1	3	0	0	0	0
Smith-Doulass Co., Inc.	1	0	3	1	0	0	0
Standard Wholesale Phosphate & Acid Works, Inc.	7	1	21	3	4	2	0
Swift & Company Fertilizer Works	7	3	21	2	0	0	2
Tennessee Corporation	5	3	15	1	1	0	0
C. P. Washburn Co.	7	0	21	2	6	1	2
Woodruff Fertilizer Works, Inc.	4	1	12	2	1	0	0
TOTALS	400	200	1,205	136	62	27	35

Serious Commercial Shortages in Mixed Fertilizers

Amount of Shortage per Ton	Number of Samples
More than \$5	2
Between \$4 and \$5	2
Between \$3 and \$4	2
Between \$2 and \$3	7
Between \$1 and \$2	29

Average Variation from Guaranteed Analysis

Twelve firms have registered five or more brands of mixed fertilizers. On the basis of composition found by analysis as well as of tonnage sold, the following table shows to what extent each manufacturer was successful in avoiding deficiencies in plant food guarantees in his mixtures. One of the twelve firms has an average deficiency in one plant food element.

Manufacturer	Average Percentage of Plant Food Above or Below the Minimum Guarantee		
	Nitrogen	Available Phosphoric Acid	Water Soluble Potash
American Agricultural Chemical Co.	+	+	+
Apothecaries Hall Co.	+	+	+
Armour Fertilizer Works	-.06	+	+
Baugh & Sons Co.	+	+	+
Berkshire Chemical Co.	+	+	+
Consolidated Rendering Co.	+	+	+
Eastern States Farmers' Exchange	+	+	+
International Minerals & Chemical Corporation	+	+	+
Old Deerfield Fertilizer Co., Inc.	+	+	+
Olds & Whipple, Inc.	+	+	+
Rogers & Hubbard Co.	+	+	+
Swift & Company Fertilizer Works	+	+	+

Explanation of Tables of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand", and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

From the Control Official's viewpoint, the amount of overrun, within reasonable limits, found in any sample of fertilizer is not especially significant. Of main importance is the fact that the particular sample analyzed shows that the manufacturer of the brand represented by the sample is selling a product which is or is not substantially as guaranteed. The manufacturer whose 4-9-7 brand is found by the Control Official to be running 4.01-9.03-7.02 in every sample of the brand tested is meeting all requirements covering this part of the fertilizer control laws as fully as the manufacturer of another 4-9-7 brand found to run 4.85-9.95-7.90 in each sample tested.

Therefore this table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton

Name of Manufacturer and Brand	Where Sampled	Approximate Commercial Shortage Per Ton	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found
			Water Insoluble	Total		
Acme Guano Co.						
Acme 4-10-10	New Bedford	\$1.98	.07	4.05	10.45	8.10
American Agricultural Chemical Co.						
AA Market Garden Fertilizer 4-12-4	Taunton	3.49	.29	3.49	10.95	3.86
AA Market Garden Fertilizer 4-12-4 (a)	Seckonk	1.22	.38	3.86	11.63	3.84
AA Potato & Root Crop Fertilizer 4-10-10	Sunderland	1.20	.43	4.12	10.29	8.79
AA Potato & Root Crop Fertilizer 4-10-10	Rochester	1.49	.44	4.59	10.83	8.47
AA Potato & Root Crop Fertilizer 4-10-10	Hatfield	1.10	.49	4.00	10.20	8.85
AA Potato & Root Crop Fertilizer 4-10-10 (a)	North Amherst	1.01	.47	4.02	10.28	8.96
AA Sure Crop Fertilizer 3-12-6	Lakeville	1.34	.18	3.03	12.78	4.66
AA Sure Crop Fertilizer 3-12-6	Taunton	1.03	.17	3.17	12.86	4.90
AA Sure Crop Fertilizer 3-12-6	Bridgewater	1.20	.18	3.04	12.50	4.79
AA Sure Crop Fertilizer 3-12-6	Westboro	1.29	.18	3.04	12.67	4.65
AA Sure Crop Fertilizer 3-12-6	Walham	1.29	.19	2.96	12.25	4.73
AA Sure Crop Fertilizer 3-12-6 (a)	East Falmouth	3.41	.35	2.38	11.35	5.98
Agrico for Potatoes & Vegetables 4-10-10 (a)	Mansfield	1.06	.33	3.68	10.25	10.15
Agrico Victory Garden Fertilizer "For Food Production Only" 3-8-7	Middleboro	2.79	.10	2.76	9.40	5.23
Agrico Victory Garden Fertilizer "For Food Production Only" 3-8-7	Buzzards Bay	1.79	.03	3.18	9.03	6.07
Agrico Victory Garden Fertilizer "For Food Production Only" 3-8-7 (a)	Foxboro	2.20	.04	3.03	7.33	7.71
Armour Fertilizer Works						
Armour's Big Crop Fertilizer 0-20-20 (a)	Chelsea	2.84	—	—	19.38	18.38
Armour's Big Crop Fertilizer 4-9-7 (a)	Attleboro	1.34	.42	3.71	8.86	7.09
Armour's Big Crop Fertilizer 4-10-10 (a)	South Deerfield	1.31	.35	3.76	9.95	9.73

Joseph Breck & Sons										
Brexone for Vegetables 4-10-10 (a)	.	.	.	.	.	1.41	3.08	4.04	10.18	9.20
Consolidated Rendering Co.										
Corenco 4-9-7 General Crop Manure (a)	.	.	.	.	.	2.08	.02	3.61	9.27	6.38
Corenco 4-10-10 Potato Grower (a)	.	.	.	.	.	1.69	.05	3.72	10.52	9.27
Thomas W. Emerson Co.										
Emseco Victory Garden 3-8-7	.	.	.	.	.	10.48	.54	3.87	5.72	4.53
Emseco Victory Garden 3-8-7	.	.	.	.	.	5.35	.55	3.29	6.10	5.20
Emseco and English Formula 4-9-7	.	.	.	.	.	1.45	.32	4.87	8.25	10.86
Grasalo Co.										
Grasalo Organic Fertilizer 3-6-6	.	.	.	.	.	4.43	1.92	2.37	7.08	4.91
International Minerals & Chemical Corporation										
International 0-14-14 (a)	.	.	.	.	.	2.94	—	—	15.52	10.93
International 4-9-7 (a)	.	.	.	.	.	1.29	.44	3.64	9.86	7.21
International All Organic 4-10-10 (a)	.	.	.	.	.	4.77	2.66	3.56	11.60	9.55
International 6-3-6 (a)	.	.	.	.	.	1.47	2.95	5.68	3.94	6.43 b
Rogers & Hubbard Co.										
Hubbard High Potash Fertilizer 4-10-10 (a)	.	.	.	.	.	1.49	1.09	4.10	10.07	8.70
Hubbard Tobacco Grower 6-3-6 (a)	.	.	.	.	.	1.21	3.93	5.64	3.92	6.78
Red H Brand 0-14-14	.	.	.	.	.	1.81	—	—	16.29	12.72

^a See also table of "Mixtures substantially complying with guarantees."

^b Potash in forms other than muriate.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton—Concluded

Name of Manufacturer and Brand	Where Sampled	Approximate Commercial Shortage Per Ton	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found
			Water Insoluble	Total		
Standard Wholesale Phosphate & Acid Works, Inc.						
Standard 4-9-7 (a)	Hadley	\$1.65	.32	3.70	9.89	6.37
Standard 4-10-10 (a)	Hadley	1.86	.10	3.60	11.43	9.52
Standard 4-12-4 (a)	Hadley	1.07	.31	3.68	12.80	4.77
Swift & Company Fertilizer Works						
Vigoro 3-12-6 (a)	Wakefield	2.33	.26	3.76	12.00	4.22
Vigoro 4-12-4	Halifax	2.57	.40	4.00	10.73	4.26
C. P. Washburn Co.						
Market Garden 4-6-7 (a)	Middleboro	1.14	.45	4.03	8.71	6.47
Special Potato 4-10-10	Middleboro	1.18	.30	3.73	10.32	9.66
Special Potato 4-10-10 (a)	Middleboro	1.23	.40	4.05	10.37	8.80

^a See also table of "Mixtures substantially complying with guarantees."

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Acme Guano Co.		
Acme Victory Garden 3-8-7	2	.41
American Agricultural Chemical Co.		
AA Market Garden Fertilizer 4-12-4	9 a	.30
AA Potato & Root Crop Fertilizer 4-10-10	7 a	.39
AA Potato & Vegetable Fertilizer 4-9-7	5	.37
AA Sure Crop Fertilizer 3-12-6	11 a	.18
AA XXX Mixture 0-14-14	3	—
Agrico Alkaline 0-14-14	3	—
Agrico for Commercial Growers 4-12-4	2	.38
Agrico for Corn 3-12-6	4	.23
Agrico for Lawns, Trees and Shrubs 3-10-5	4	2.02
Agrico for New England 4-9-7	4	.29
Agrico for Potatoes & Vegetables 4-10-10	3 a	.44
Agrico for Seeding Down 4-16-20	3	.09
Agrico for Tobacco 6-3-6	3 b	4.10
Agrico for Truck 4-12-4	3	.39
Agrico Victory Garden Fertilizer "For Food Production Only" 3-8-7	3 a	.04
Apothecaries Hall Co.		
Liberty Victory Fertilizer 3-8-7	3	1.43
Liberty Fertilizer 3-12-6	3	.67
Liberty Fertilizer 4-9-7	3	.52
Liberty Fertilizer 4-10-10	3	.67
Liberty Fertilizer 4-10-10 (with Sul. Potash)	1 b	.53
Liberty Fertilizer 4-12-4	3	.77
Liberty Tobacco Mixture (with Cotton Hull Ashes) 6-3-6	3 b	4.73
Armour Fertilizer Works		
Armour's Big Crop Fertilizer 0-20-20	1 a	—
Armour's Big Crop Fertilizer 3-12-6	4	.38
Armour's Big Crop Fertilizer 4-9-7	4 a	.43
Armour's Big Crop Fertilizer 4-10-10	5 a c	.39
Armour's Big Crop Fertilizer 4-12-4	3	.36
Armour's Big Crop Fertilizer 4-16-20	1	.13
Armour's Big Crop Tobacco Special 5-3-5	1 b	2.11
Armour's Big Crop Tobacco Special 6-3-6	1 b	2.67
Armour's Big Crop Fertilizer 6-15-15	3	.26
Armour's Victory Garden Fertilizer 3-8-7	5	.37
Ernest J. Banile		
Potato 4-9-7	1	.71
Potato 4-10-10	1	1.02
F. A. Bartlett Tree Expert Co.		
Bartlett Green Tree Food 6-7-4	1	1.07
Baugh & Sons Co.		
Baugh's Balanced Plant Food 4-12-4	1	.15
Baugh's Perfection Brand 3-12-6	1	.15
Baugh's 4-10-10	1	.14
Belmont Gardens		
Gardenia Fertilizer (Belgard) 6-15-4	1	.84
Berkshire Chemical Co.		
Berkshire Victory Garden (For Food Production Only) 3-8-7	3	.15
Berkshire 4-9-7	5	.16
Berkshire 4-10-10	2	.16
Berkshire 4-12-4	3	.20
Berkshire 6-3-6	1 b	3.35
Joseph Breck & Sons		
Breck's Victory for Food Crops Only 3-8-7	1	.21
Brexone for Lawns and Gardens 5-10-4	2	3.74
Brexone for Vegetables 4-10-10	1 a	3.21
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser	2	—
Corenco 3-8-7 Victory Garden	5	.24
Corenco 3-10-3 Landscape	2	2.77
Corenco 3-12-6 Animal Brand	6	.16
Corenco Landscape Fertilizer 4-7-3	2	3.39
Corenco 4-9-7 General Crop Manure	6 a	.06
Corenco 4-10-10 Potato Grower	4 a	.06
Corenco 4-12-4 Complete Manure	4	.07
Corenco 6-3-6 Special Tobacco Grower	1 b	3.10
Corenco 6-15-15	2	.05

a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b Potash in forms other than muriate.

c Potash in forms other than muriate in one sample.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Eastern States Farmers' Exchange		
Eastern States 0-9-27 with .5% magnesium oxide	1	—
Eastern States 0-14-14 with 1% magnesium oxide	2	—
Eastern States 3-8-7	4	.20
Eastern States 3-12-6 with 1% magnesium oxide	4	.16
Eastern States 4-10-10 with 1% magnesium oxide	4	.16
Eastern States 4-16-20 with .5% magnesium oxide	1	.10
Eastern States 6-15-15 with 1% magnesium oxide	5	.12
Eastern States 6-15-15 Low Chlorine with .5% magnesium oxide	2	.09
Eastern States 8-4-8 Tobacco	1 <i>b</i>	2.32
Thomas W. Emerson Co.		
Emseco 4-10-10	1	.23
Essex County Cooperative Farming Association		
S-X Brand 3-12-6	1	.24
S-X Brand (1% Magnesium Oxide) 4-10-10	1	.15
Excell Laboratories		
New Plant Life 2-1-2	1	—
H. L. Frost & Higgins Co.		
Frost's Lawn & Shrubbery Special 8-6-3	1	3.67
Frost's Shade Tree Special 8-6-6	1	4.15
Grasalo Co.		
Grasalo Chemical Fertilizer 3-8-7	1	.19
Greenlands Services, Inc.		
Rhododendrons and Evergreens 4-6-4	1	3.75
Henderson & Herndon Tree Co., Inc.		
H. & H. Plant Food 5-5-10	1	3.25
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19	2	.02
Hy-Trous Corporation		
Hy-Trous 4-8-4	2	—
International Minerals & Chemical Corporation		
International 0-14-14	2 <i>a</i>	—
International 3-12-6	3	.23
International 4-9-7	6 <i>a</i>	.22
International 4-10-10	4	.33
International All Organic 4-10-10	1 <i>a</i>	2.91
International 4-12-4	4	.27
International All Organic 5-6-4	3	3.65
International 6-3-6	2 <i>a b</i>	2.73
International 6-15-15	3	.08
International Victory Garden Fertilizer 3-8-7	3	.16
Mechling Bros. Chemicals, Division of General Chemical Co.		
Veget Aid 5-10-5	2	.92
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield Victory 3-8-7	1	.49
Old Deerfield 3-12-6 Fertilizer	1	.14
Old Deerfield 4-9-7	5	.76
Old Deerfield 4-10-10	4	.46
Old Deerfield with Sulphate of Potash 4-10-10 with 2% magnesium oxide	2 <i>b</i>	.95
Old Deerfield 4-12-4	2	.71
Old Deerfield Lawnshrub 5-5-5	2	3.94
Old Deerfield 6-3-6 Complete Tobacco Fertilizer	7 <i>b</i>	3.73
Olds & Whipple, Inc.		
O & W 3-12-6 Fertilizer	2	.67
O & W 4-9-7 General Purpose Fertilizer	3	.65
O & W 4-9-7 General Purpose Fertilizer with Sulphate of Potash	1 <i>b</i>	.95
O & W 4-10-10 Potato Fertilizer	3 <i>c</i>	.68
O & W 4-12-4 Market Garden Fertilizer	2	.53
O & W 5-3-5 Complete Tobacco Fertilizer	1 <i>b</i>	3.29
O & W 6-3-6 Blue Label Tobacco Fertilizer	1 <i>b</i>	3.54
O & W 6-3-6 Blue Label Tobacco Fertilizer Potash Derived from Cotton Hull Ash	3 <i>b</i>	3.42

a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b Potash in forms other than muriate.

c Potash in forms other than muriate in one sample.

Mixtures Substantially Complying with Guarantees—Concluded

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Plantabbs Co.		
Fulton's "V" Plantabbs 4-12-18	1	2.81
Rogers & Hubbard Co.		
Carnation Special 3-10-4	2	2.32
Gro-Fast Plant Food 4-8-4	2	3.91
Hubbard All Soils Fertilizer 4-12-4	2	1.14
Hubbard Climax Tobacco Fertilizer 5-3-5	2 <i>b</i>	3.57
Hubbard Corn & Grain Fertilizer 3-12-6	2	.57
Hubbard High Potash Fertilizer 4-10-10	3 <i>a</i>	.92
Hubbard Potato Fertilizer 4-9-7	3	1.06
Hubbard Tobacco Grower 6-3-6	4 <i>a b</i>	4.18
Red H Brand 3-10-10	2	.42
Red H Brand 3-12-6	5	.47
Red H Brand 4-9-7	4	.49
Red H Brand 4-10-10	4	.48
Red H Brand 4-12-4	2	.56
Red H Brand 6-15-15	1	.14
Victory Garden Fertilizer 3-8-7	4	1.28
Warrior Tobacco Fertilizer with Cotton Hull Ashes 6-3-6	1 <i>b</i>	2.06
William H. Rorer, Inc.		
Plant Dinner 5-7-5	1	.54
O. M. Scott & Sons Co.		
Scotts Turf Builder 6-8-4	2	5.32
Scotts Victory Garden Fertilizer 3-8-7	2	1.50
M. L. Shoemaker Division, Wilson & Co., Inc.		
Shoemaker's "Swift-Sure" Victory Garden Fertilizer 3-8-7	1	.85
Smith-Douglass Co., Inc.		
Smith Victory Garden 3-8-7	1	.12
Standard Wholesale Phosphate & Acid Works, Inc.		
Standard 4-9-7	1 <i>a</i>	.45
Standard 4-10-10	2 <i>a</i>	.17
Standard 4-12-4	1 <i>a</i>	.19
Swift & Company Fertilizer Works		
Vigoro Victory Garden Fertilizer for Food Production only 3-8-7	3	.20
Vigoro 3-12-6	2 <i>a</i>	.15
Tennessee Corporation		
Loma 4-12-4	2	1.19
Victory Garden Fertilizer 3-8-7	3	.37
C. P. Washburn Co.		
Market Garden 4-9-7	2 <i>a</i>	.47
Special Potato 4-10-10	2 <i>a</i>	.36
Woodruff Fertilizer Works, Inc.		
Woodruff's 4-9-7 Fertilizer	2	.59
Woodruff's 4-10-10 Fertilizer	1	.64
Woodruff's 4-12-4 Fertilizer	1	.74

a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b Potash in forms other than muriate.

NITROGEN COMPOUNDS
Calcium Cyanamid, Nitrate of Soda, Sulfate of Ammonia, Synthetic Urea

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
Allied Chemical and Dye Corp., The Barrett Division		
Arcadian the American Nitrate of Soda	16.25	16.00
Arcadian Sulphate of Ammonia	20.73	20.60
American Cyanamid Co.		
20.6% Aero Cyanamid Granular	21.52	20.60
Chilean Nitrate Sales Corp.		
Chilean Nitrate of Soda—Champion Brand	16.16	16.00
Chilean Nitrate of Soda—Champion Brand	16.26	16.00
E. I. du Pont de Nemours & Co., Inc.		
Du Pont Uranion Fertilizer Compound	43.74	42.00
Eastern States Farmers' Exchange		
Eastern States Sulphate of Ammonia	20.98	20.50
Old Deerfield Fertilizer Co., Inc.		
Nitrate of Soda	16.10	16.00
Sulphate of Ammonia	21.43	20.50

Cottonseed Meal, Soybean Oil Meal

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
Archer-Daniels-Midland Co.		
Archer Brand 41% Protein Soybean Oil Meal	7.38	6.56
Ashcraft-Wilkinson Co.		
Cow-Eta Brand 41% Protein Cottonseed Meal	6.51	6.58
Cow-Eta Brand 41% Protein Cottonseed Meal	6.60	6.58
Cow-Eta Brand 41% Protein Cottonseed Meal	6.56	6.58
Cow-Eta Brand 41% Protein Cottonseed Meal	6.70	6.58
Cow-Eta Brand 41% Protein Cottonseed Meal	6.55	6.58
L. B. Lovitt & Co.		
Lovitt Brand 41% Protein Cottonseed Meal	6.66	6.56
Lovitt Brand 41% Protein Cottonseed Meal	6.65	6.56
Lovitt Brand 41% Protein Cottonseed Meal	6.66	6.56
Lovitt Brand 41% Protein Cottonseed Meal	6.64	6.56

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
18% Normal Superphosphate	19.60	18.80	18.00
18% Normal Superphosphate	20.25	19.85	18.00
18% Normal Superphosphate	18.70	18.66	18.00
Apothecaries Hall Co.			
Superphosphate 20%	21.40	20.66	20.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%	20.63	19.58	20.00
Consolidated Rendering Co.			
Superphosphate 20%	21.45	20.75	20.00
Superphosphate 20%	20.40	20.40	20.00
Superphosphate 20%	20.35	19.59	20.00
Davison Chemical Corporation			
Davco Granulated 20% Superphosphate	21.60	20.76	20.00
Eastern States Farmers' Exchange			
Eastern States Superphosphate 20%	22.10	21.34	20.00
Eastern States Superphosphate 20%	21.20	20.42	20.00
Eastern States Superphosphate 47%	48.35	47.83	47.00
Goulard & Olena, Inc.			
G & O Superphosphate 20%	22.05	21.71	20.00
International Minerals & Chemical Corporation			
International Superphosphate 20%	20.35	19.85	20.00
International Superphosphate 20%	21.60	20.72	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield Superphosphate 20%	20.45	20.21	20.00
Olds & Whipple, Inc.			
O & W Superphosphate 20%	21.80	20.72	20.00
Rogers & Hubbard Co.			
Hubbard Superphosphate 20%	20.95	20.79	20.00
Hubbard Superphosphate 20%	20.40	20.40	20.00

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Dry Ground Fish, Animal Tankage, Bone and Tankage

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
Rogers & Hubbard Co.				
Dry Ground Fish	9.85	9.46	7.00	5.00
N. Roy & Son				
Animal Tankage (a)	7.98	7.00	12.60	8.00

Sample Showing Commercial Shortage of More than \$1 per Ton

Consolidated Rendering Co.				
Bone and Tankage	3.75 b	4.00	21.50	20.00

a Degree of fineness: coarser than 1/50 inch, 66.2%.
 b Commercial shortage \$1.91 per ton.

Ground Bone

Manufacturer	Nitrogen		Total Phosphoric Acid		Degree of Fineness
	Found	Guaranteed	Found	Guaranteed	Coarser than 1/50 Inch
American Agricultural Chemical Co.	3.07	2.47	24.65	23.00	33.8
	3.82	2.47	23.65	23.00	45.4
	2.43	2.47	25.25	23.00	46.1
	2.73	2.47	23.95	23.00	23.4
Apothecaries Hall Co.	3.23	2.25	24.85	22.00	39.9
Armour Fertilizer Works	2.99	2.47	27.30	23.00	48.7
Consolidated Rendering Co.	3.68	2.47	23.95	23.00	52.4
	2.69	2.47	24.00	23.00	42.8
	3.01	2.47	25.70	23.00	21.0
Eastern States Farmers' Exchange	2.70	2.30	26.75	23.00	28.9
	2.73	2.30	27.30	23.00	24.7
A. H. Hoffman, Inc.	3.74	3.70	19.55	20.00	63.4
International Minerals & Chemical Corp.	2.92	2.47	25.70	23.00	35.0
Olds & Whipple, Inc.	2.81	2.47	26.05	22.00	38.8
John Reardon & Sons Division of Wilson & Co., Inc.	3.53	2.47	24.30	21.00	41.8
	3.42	2.47	20.75	21.00	40.9
Rogers & Hubbard Co.	2.03	2.00	26.25	23.00	10.2
	2.13	2.00	25.30	23.00	11.0
	2.86	2.47	26.25	23.00	33.4
	4.36	3.70	24.38	24.70	26.9
	4.29	3.70	24.38	24.70	12.7
	4.45	3.70	23.93	24.70	5.7
	3.95	3.70	22.45	20.00	26.7
	4.01	3.70	23.90	20.00	68.8
	3.68	3.70	22.20	20.00	35.7
	4.03	3.70	21.70	20.00	36.2
	4.36	3.70	23.70	20.00	10.9
	3.96	3.70	24.15	20.00	15.0
3.92	3.70	20.85	20.00	44.1	
Swift & Company Fertilizer Works	2.75	2.47	26.35	23.00	25.5

Samples Showing Commercial Shortage of More than \$1 per Ton

American Agricultural Chemical Co.	3.80	2.47	21.00 _a	23.00	55.5
	1.99 _b	2.47	23.75	23.00	39.1
	2.28 _c	2.47	25.85	23.00	26.0
	2.17 _d	2.47	26.65	23.00	33.5
International Minerals & Chemical Corp.	3.40	2.47	21.30 _e	23.00	32.1
Rogers & Hubbard Co.	2.19 _f	2.47	30.35	23.00	
	1.79 _e	2.47	30.85	23.00	32.0
	2.25 _h	2.47	29.65	23.00	45.2
	2.32 _i	2.47	29.00	23.00	15.2
	4.47	3.70	23.75 _j	24.70	4.4
	4.43	3.70	23.85 _k	24.70	4.3

Commercial shortage per ton: *a* \$2.79; *b* \$3.67; *c* \$1.46; *d* \$2.29; *e* \$2.56; *f* \$2.81; *g* \$6.07; *h* \$1.84; *i* \$1.24; *j* \$1.24; *k* \$1.05.

Milorganite

Manufacturer and Brand	Nitrogen		Available Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
Sewerage Commission of the City of Milwaukee				
Milorganite	5.61 <i>a</i>	6.00	2.28	2.00
Milorganite	5.83 <i>b</i>	6.00	2.17	2.00
Milorganite	5.74 <i>c</i>	6.00	2.46	2.00

a Commercial shortage \$2.93 per ton.

b Commercial shortage \$1.28 per ton.

c Commercial shortage \$1.95 per ton.

POTASH COMPOUNDS

Muriate and High Grade Sulfate of Potash

Manufacturer	Muriate of Potash		High Grade Sulfate of Potash		Chlorine
	Water Soluble Potash		Water Soluble Potash		
	Found	Guaranteed	Found	Guaranteed	
American Agricultural Chemical Co.	48.92	50.00	52.16	52.00	1.12
	51.16	50.00			
	50.16	50.00			
Armour Fertilizer Works	60.20	60.00			
Consolidated Rendering Co.	61.14	60.00			
Eastern States Farmers' Exchange	59.84	60.00			
	59.12	60.00			
	59.39	60.00			
	61.76	60.00			
International Minerals & Chemical Corp.	49.64	50.00			
	49.84	50.00			
	51.70	50.00			
Middlesex County Farm Bureau Ass'n.	60.44	60.00			
Old Deerfield Fertilizer Co., Inc.	60.88	60.00			
Rogers & Hubbard Co.	60.16	60.00			

Samples Showing Commercial Shortage of More than \$1 per Ton

Eastern States Farmers' Exchange			49.94 <i>a</i>	52.00	2.66
Goulard & Olena, Inc.	47.24 <i>b</i>	50.00			
International Minerals & Chemical Corp.	48.58 <i>c</i>	50.00			
Rogers & Hubbard Co.	58.37 <i>d</i>	60.00			
	58.54 <i>e</i>	60.00			

Commercial shortage per ton: *a* \$1.85. *b* Since this material is sold in small packages a calculation of the shortage per ton is not feasible. *c* \$1.20; *d* \$1.31; *e* \$1.18.

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen		Total Phosphoric Acid		Available Phosphoric Acid		Water Soluble Potash		Organic Matter	Acid Insoluble Ash (d)	Moisture
	Found	Guaran- teed	Found	Guaran- teed	Found	Guaran- teed	Found	Guaran- teed			
American Agricultural Chemical Co. Pulverized Sheep & Goat Manure	1.65	1.25	1.11	1.00	1.07	—	2.91	2.00	39.85	20.63	17.70
Apothecaries Hall Co. Sheep Manure	1.43	1.00	1.19	.50	1.15	—	3.20	1.00	39.27	39.08	7.35
Armour Fertilizer Works Sheep Manure	2.52	1.25	2.11	1.00	2.01	—	3.45	2.00	56.87	20.33	8.45
Atkins & Durbrow, Inc. Driconure	2.78	2.00	3.75	1.00	3.45	1.00	1.86	1.00	65.07	4.95	15.40
Joseph Breck & Sons Breck's Pulverized Cattle Manure	2.03	2.00	1.72	—	1.72	1.00	3.29	1.00	50.25	32.23	6.00
Breck's Shredded Cattle Manure	2.04	2.00	1.71	—	1.71	1.00	2.91	1.00	52.89	39.03	5.68
Breck's Kam's Head Sheep Manure	1.95	2.00	1.49	—	1.49	1.00	3.18	1.00	58.15	21.95	6.75
Consolidated Rendering Co. Corenco Sheep Manure	1.88	1.25	1.71	1.00	1.63	—	3.72	2.00	51.72	27.38	6.65
Glendale Poultry Farm "Biff" Peat-Poultry Manure	2.60	2.00	3.22	—	3.06	3.00	1.71	1.00	26.04	13.26	8.70
A. H. Hoffman Co. Hoffman's Cow Manure (Dehydrated)	2.39	2.00	2.15	—	2.15	2.00	2.56	2.00	81.60	2.15	5.25
Hoffman's Sheep Manure (Kiln-Dried)	1.44	1.85	1.09	—	1.09	1.00	2.17	2.00	36.44	45.50	4.13
International Minerals & Chemical Corporation International Caribbee Sheep Manure	1.58	1.25	1.26	—	1.26	75	3.82	2.00	43.19	38.73	3.93
Norwood Brand Fertilizer Co. Norwood Brand Sheep Manure Screened from Wool	1.83	1.83	.40	—	.40	.89	3.91	1.03	39.00	43.68	5.70
Norwood Brand Sheep Manure Screened from Wool	1.61	1.83	.40	—	.40	.89	4.34	1.03	37.77	43.33	7.10

Pulverized Manure Co.														
Wizard Cow Manure	2.00	1.33	—	1.33	1.00	1.22	1.00	64.97	19.25	5.45				
Wizard Brand Pulverized Sheep Manure	2.24	1.40	—	1.38	1.00	2.67	2.00	73.27	6.05	9.23				
Ramshorn Mills														
Sheep Manure—Wool Waste	2.45	.66	.50	.64	—	3.53	4.50	59.84	16.35	6.38				
Rogers & Hubbard Co.														
Geo-Fast Cow Manure	2.27	3.10	2.00	2.72	—	3.32	2.00	59.16	16.75	6.28				
Hubbard Domestic Sheep Manure	1.93	2.34	1.00	2.06	—	3.53	1.50	39.75	20.15	14.95				
Stockdale Fertilizer Co.														
Ovone (Sheep Manure)	2.11	1.59	—	1.59	1.00	2.96	2.00	71.99	8.03	7.83				
Swift & Company Fertilizer Works														
Swift's Sheep Manure	2.07	1.59	—	1.59	1.00	3.26	2.00	53.29	28.75	4.43				
Walker-Gordon Laboratory Co., Inc.														
Bovving	2.13	2.43	2.00	2.39	—	2.37	2.00	79.12	2.23	6.60				

4. The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food.

AGRICULTURAL LIME PRODUCTS

Manufacturers and Brands

During 1943, 17 firms registered for sale in Massachusetts 39 brands of lime products, manufactured and sold for neutralizing acid soils, and one brand of gypsum. The products are grouped as follows:

Hydrated or slaked lime	23
Pulverized and ground limestone	15
Lime ashes	1
	—
	39
Gypsum	1

The analytical results which appear in this bulletin represent officially drawn samples secured by the same sampling agents who drew the samples of commercial fertilizer which served for the inspection of that commodity; the samples therefore came from every section of the state and are, we believe, representative of the lime products sold in Massachusetts as soil amendments.

We were not successful in securing samples of the following brands:

- Brewer & Co., Inc.**, 45 Arctic Street, Worcester, Mass.
 - Lime Kiln Ashes
 - Producto Agricultural Lime
- Kelley Island Lime & Transport Co.**, 1122 Leader Building, Cleveland, Ohio
 - Tiger All Purpose Hydrated Lime
- Lawrence Portland Cement Co.**, Thomaston, Maine
 - Dragon "Mainrok" Land Lime
- Limestone Products Corporation of America**, Newton, N. J.
 - "Lime Crest" Brand Calcite Hydrated Lime
 - "Lime Crest" Brand Calcite Pulverized (Pulverized Limestone)
- New England Lime Co.**, Adams, Mass.
 - Nelco Agricultural Hydrated Lime
 - Nelco Agricultural Ground Limestone (Canaan, Conn.)
- Rockland-Rockport Lime Co., Inc.**, Rockland, Maine
 - R-R Ground Limestone, Grade C
 - R-R Land Lime, Grade C
- Solvay Process Co.**, Syracuse, N. Y.
 - Solvay Pulverized Limestone

Variations and Deficiencies Found in the Composition of Lime Products

Of the lime products effective in neutralizing soil acidity, about 88 per cent of the samples analyzed fully met the minimum guarantee; of the 20 samples of ground limestone, 3 showed deficiencies. Most of the deficiencies were not of a serious nature as the companion ingredient was present in sufficient excess to more than make up the full neutralizing value of the product as based on the stated guarantee. The same may be said of the hydrated lime products where one out of 17 samples showed a deficiency. The tables of analyses show the extent of variations from the guaranteed composition.

Explanation of Tables of Analyses

Tables I, II, III, "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Tables II and III, "Carbonates of calcium and magnesium". The figures in this column are exclusive of the small amounts of calcium and magnesium combined as basic silicates; these are readily soluble in mineral acid solutions but obviously should not be classed as carbonates.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass or be retained by the meshed sieves mentioned.

The limestone products have been published in two groups or grades (see tables II and III) according to fineness of grinding and to conform to definitions voted by the Association of Official Agricultural Chemists at their 1936 meeting.

Table I. Hydrated or Slaked Lime

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass.							
Green Mountain Handy Hydrate	72.2	60.0	1.5	1.0	73.5	1470	2.0
Snow Fluff Agricultural Hydrate	70.1	70.0	4.4	5.0	75.0	1500	2.6
Sure Crop Agricultural Hydrate	72.4	65.0	1.5	1.0	73.0	1460	5.0
Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.							
Bald Eagle Hydrated Lime	72.4	69.3	1.5	7	73.4	1468	2.7
A. H. Hoffman, Inc., Landisville, Penn.							
Hoffman's Hydrated Lime	70.1	70.0	2.3	1.0	71.2	1424	4.0
Hoosac Valley Lime Co., Adams, Mass.							
Adams Land Lime	62.8	60.0	2.8	.5	64.5	1290	8.7
Hoosac Agricultural Hydrated Lime	74.1	65.0	.9	.5	74.3	1486	1.8
Lee Lime Corporation, Lee, Mass.							
Lee Double Strength Agricultural Hydrated Lime	48.2	46.0	31.6	31.0	92.3	1846	2.4
Lee Land Lime	41.9	35.0	39.2	25.0	79.9	1598	2.0
Tobey Agra Hydrate	43.3	35.0	29.6	25.0	83.3	1666	1.9
Clifford L. Miller, West Stockbridge, Mass.							
Monarque Hydrated Lime	62.3	60.0	13.8	4.0	79.8	1596	3.6
New England Lime Co., Adams, Mass.							
Nelco Agricultural Hydrated Lime (Adams)	73.6	70.0	.9	5	74.7	1494	2.2
Nelco Land Lime (Canaan, Conn.)	43.3	35.0	29.1	25.0	82.2	1644	2.4
North American Cement Corporation, 1504 O'Sullivan Bldg., Baltimore, Md.							
Berkeley Hydrated Lime	70.1	70.0	2.3	2.0	71.8	1436	2.8
United States Gypsum Co., 300 West Adams St., Chicago, Ill.							
Red Top Hydrated Lime	71.0	70.0	1.5	—	71.7	1434	2.3
USG Agricultural Land Lime	73.1	60.0	1.6	—	74.1	1482	1.9
USG Hydrated Lime	72.7	70.0	1.3	—	74.0	1480	2.3

Table II. Pulverized Limestone (Fine-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Carbonates of Calcium and Magnesium		Neutralizing Value Expressed in Terms of Calcium Oxide		Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds In One Ton	Finer than 100-mesh	Coarser than 20-mesh
Hoosac Valley Lime Co., Adams, Mass. Hoosac Agricultural Limestone	54.4	51.5	1.3	5	99.8	90.0	55.7	1114	87.7	1.2
Lee Lime Corporation, Lee, Mass. Tobey Pulverized Limestone	42.9	35.0	8.2	10.0	93.6	90.0	54.3	1086	78.9	3
New England Lime Co., Adams, Mass. Nelo Agricultural Limestone (Adams)	53.7	53.5	1.5	4	97.2	96.3	55.5	1110	90.2	none
United States Gypsum Co., 300 West Adams St., Chicago, Ill. USG Agricultural Limestone—Farmans, Mass. USG Agricultural Limestone—Farmans, Mass.	53.6 51.5	50.5 50.5	9 2.5	5 .5	98.4 93.9	91.0 91.0	55.0 54.2	1100 1084	94.7 84.2	none none

Table III. Ground Limestone (Coarse-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Carbonates of Calcium and Magnesium		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Conklin Limestone Co., Inc., Canaan, Conn. High Magnesium Agricultural Ground Limestone	28.4	30.0	18.7	20.0	89.1	90.0	53.2	1064	10.6	45.7	.2
Grangers Manufacturing Co., 53 State St., Boston, Mass. Grangers Agricultural Limestone	38.8	34.0	9.1	6.0	88.3	90.0	51.8	1036	11.5	61.2	3.1
Lee Lime Corporation, Lee, Mass. Lee Pulverized Limestone	31.2	30.0	21.3	20.0	97.5	93.0	60.3	1206	1.2	40.4	.1
Lee Pulverized Limestone	31.5	30.0	20.9	20.0	99.9	93.0	60.9	1218	9	47.8	.1
Lee Pulverized Limestone	32.2	30.0	22.6	20.0	95.1	93.0	62.8	1256	.8	46.2	.2
Lee Pulverized Limestone	31.2	30.0	21.2	20.0	98.9	93.0	60.7	1214	.7	41.1	.1
Lee Pulverized Limestone	31.0	30.0	21.7	20.0	97.5	93.0	60.2	1204	1.0	46.9	.1
Clifford L. Miller, West Stockbridge, Mass. Monarque Pulverized Limestone	45.9	39.0	6.4	11.0	—	—	53.8	1076	5.4	68.6	.5
Rockland-Rockport Lime Co., Inc., Rockland, Maine R-R Ground Limestone, Grade M	31.5	30.0	21.0	17.0	98.4	94.0	60.3	1206	.8	48.8	.1
D. U. Smith & Bro., Ashley Falls, Mass. Ashley White Dolomite—Agricultural Limestone	30.8	30.0	21.1	21.0	97.6	98.0	59.8	1196	1.8	73.5	.1
United States Gypsum Co., 300 West Adams St., Chicago, Ill. USG Agricultural Limestone—Falls Village, Conn.	31.5	30.0	20.0	20.0	98.1	95.0	59.9	1198	1.6	22.3	none

Table IV . Gypsum or Land Plaster

Manufacturer and Brand	Calcium Oxide (CaO)		Calcium Sulfate (CaSO ₄)		Moisture
	Found	Guaranteed	Found	Guaranteed	
United States Gypsum Co., 300 West Adams St., Chicago, Ill. Ben Franklin Agricultural Gypsum	33.6	30.0	80.8	64.5	13.9

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1943**

- Acme Guano Co., 411 National Marine Bank Bldg., Baltimore, Md.
 Allied Chemical & Dye Corporation, The Barrett Division, 40 Rector St., New York, N. Y.
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.
 American Potash & Chemical Corporation, 122 East 42nd St., New York, N. Y.
 Apothecaries Hall Co., 8-28 Benedict St., Waterbury, Conn.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis, Minn.
 Armour Fertilizer Works, 120 Broadway, New York, N. Y.
 Ashcraft-Wilkinson Co., 601 Trust Company of Georgia Bldg., Atlanta, Ga.
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.
 Ernest J. Bantle, 130 Griswold St., Glastonbury, Conn.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Baugh & Sons Co., 20 South Delaware Ave., Philadelphia, Penn.
 Belmont Gardens, W. E. Lenk, Proprietor, 170 Brighton St., Belmont, Mass.
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport, Conn.
 Joseph Breck & Sons, 85 State St., Boston, Mass.
 Buell Fertilizer Co., Exeter, N. H.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Davison Chemical Corporation, Rouse Bldg., Baltimore, Md.
 E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
 Eastern States Farmers' Exchange, West Springfield, Mass.
 Thomas W. Emerson Co., 70 Park St., Beverly, Mass.
 Essex County Co-operative Farming Association, South Main St., Topsfield, Mass.
 Excell Laboratories, 2625 Indiana Ave., Chicago, Ill.
 H. L. Frost & Higgins Co., 20 Mill St., Ailington, Mass.
 Glendale Poultry Farm, Somerset, Mass.
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.
 Grasalo Co., 380 Main St., Wilmington, Mass.
 Greenlands Services, Inc., Eastman St., Concord, N. H.
 Hartney & Amalia, Inc., 581 Boylston St., Boston, Mass.
 Henderson & Herndon Tree Co., Inc., 9 Story Ave., Beverly, Mass.
 A. H. Hoffman, Inc., Landisville, Penn.
 Humphreys-Godwin Co., 81 South Front St., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., 315 West 39th St., New York, N. Y.
 Hyper-Humus Co., Box 263, Newton, N. J.
 Hy-Trous Corporation, 131 State St., Boston, Mass.
 International Minerals & Chemical Corporation, Woburn, Mass.
 L. B. Lovitt & Co., 1004 Falls Bldg., Memphis, Tenn.
 Mechling Bros. Chemicals, Division of General Chemical Co.
 12 South 12th St., Philadelphia, Penn.
 Middlesex County Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Norwood Brand Fertilizer Co., Wright St., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 Plantabbs Co., Baltimore, Md.
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago, Ill.
 Ramshorn Mills, Inc., West Millbury, Mass.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 William H. Rorer, Inc., 254 South Fourth St., Philadelphia, Penn.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
 O. M. Scott & Sons Co., Marysville, Ohio.
 Sears, Roebuck & Co., 925 South Homan Ave., Chicago, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee, Wis.
 M. L. Shoemaker Division, Wilson & Co., Inc., 3600 North Delaware Ave., Philadelphia, Penn.
 Smith-Douglass Co., Inc., 304 East Plume St., Norfolk, Va.
 Standard Wholesale Phosphate & Acid Works, Inc., Baltimore, Md.
 Stockdale Fertilizer Co., Morris, Ill.
 Swift & Company Fertilizer Works, 910 Court Square Bldg., Baltimore, Md.
 Tennessee Corporation, Lockland, Ohio
 Universal Chemical Co., 106 Ontario St., Lynn, Mass.
 Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro, Mass.
 Woodruff Fertilizer Works, Inc., North Haven, Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 119

NOVEMBER, 1943

Seed Inspection

By F. A. McLaughlin

This report, the sixteenth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1943, by authority of Chapter 94 as amended by Chapter 288 of the Acts of 1937 and Chapter 363 of the Acts of 1938.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:	Units
Purity analysis (red clover, timothy, etc.)	1
Purity analysis (bluegrass, orchard grass, etc.)	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture)	4-10
Examination for noxious weeds (sample of 4 oz. or less)	2
Identification of seed or plant	1
Cleaning tobacco seed (4 oz. or less)	2
Germination test (4 x 100 seeds of any seed not chaffy or requiring purity analysis)	1
Germination test (soil, 2 x 100 seeds)	1
Germination test (chaffy grasses or seeds requiring purity analysis)	2

Fees for work in excess of the ten free units allowed to a citizen or resident firm of Massachusetts are as follows:

Germination test of all crop seeds except grasses	\$0.25
Germination test of timothy . . . . .	.25
Germination test of all other grasses . . . . .	.50
Purity analysis of cereals . . . . .	.50
Purity analysis of timothy . . . . .	.75
Purity analysis of all other grasses	1.00
Purity analysis of all other crop seeds . . . . .	.75
Purity analysis of mixtures of not more than 2 kinds of agricultural seeds	1.00
Purity analysis of special mixtures, including lawn grasses and pasture mixtures — a charge sufficient to cover the actual cost of working the sample, depending entirely upon the character of the sample. Minimum charge	1.25

In no case will the final report be rendered until all fees are paid.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seed of any one kind to be submitted for a germination test is 400.

SEED INSPECTION

By F. A. McLaughlin¹

MASSACHUSETTS VEGETABLE SEED STANDARDS FOR 1944

Section 261D of the Seed Law requires that a set of standards for germination of vegetable seeds be determined each year by the Director of the Massachusetts Agricultural Experiment Station and approved by the Commissioner of Agriculture. The following set of standards for 1944 has been so determined and approved.

KIND OF SEED	GERMINATION STANDARD	KIND OF SEED	GERMINATION STANDARD
Artichoke.....	60	Kohlrabi.....	75
Asparagus.....	*70	Leek.....	60
Beans:		Lettuce.....	80
Limas.....	70	Melons:	
Other varieties than Limas..	80	Muskmelon.....	75
Beets.....	65	Watermelon.....	70
Broccoli.....	75	Mustard.....	75
Brussels Sprouts.....	70	Okra.....	*50
Cabbage.....	75	Onions.....	70
Carrot.....	55	Parsley.....	60
Cauliflower.....	75	Parsnip.....	60
Celeriac.....	55	Peas.....	80
Celery.....	55	Peppers.....	55
Chard, Swiss.....	65	Pumpkin.....	75
Chicory.....	65	Radish.....	75
Chinese Cabbage.....	75	Rhubarb.....	60
Citron.....	65	Rutabaga.....	75
Collards.....	80	Salsify.....	75
Corn, Sweet.....	75	Sorrel.....	60
**Cress, Garden.....	40	Spinach:	
Cress, Water.....	25	Common.....	60
Cucumber.....	80	New Zealand.....	40
Dandelion.....	45	Squash.....	75
Egg Plant.....	60	Tomato.....	75
Endive.....	70	Tomato, Husk.....	50
Fetticus (Corn Salad).....	70	Turnip.....	80
Kale.....	75		

*Including Hard Seeds.

**Garden Cress (*Lepidium sativum*) is also called Pepper Grass and Curled Cress. Should not be confused with Upland Cress or Spring Cress (*Campe verna*) for which no standard has been adopted.

The above set of standards is identical with the one adopted by the United States Department of Agriculture for administration of the Federal Seed Act.

¹ Assisted by Miss Jessie L. Anderson, Technical Assistant; Miss Alice Slack, Laboratory Assistant from May to October, 1943; and Miss May J. Honnay, Clerk.

1943 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1942, to November 1, 1943, the Seed Laboratory received 4825 samples of seed, of which 1137 were collected by the State Department of Agriculture and 3688 were sent in by seedsmen, farmers, and various state institutions. An additional lot of 225 samples of flower seeds, for field tests only, was received from the State Commissioner of Agriculture. Although 4825 samples of seed were received, 333 of these had not been tested on November 1, 1943, consequently the actual number of samples worked during the year is 4492.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 4492 samples was 5162; 370 for purity and 4792 for germination.

NUMBER OF SAMPLES		NUMBER OF TESTS	
		PURITY	GERMINATION
282	Field Crops for Purity and Germination.....	282	282
287	Field Crops for Germination Only.....	...	287
75	Lawn and Other Types of Mixtures for Purity; Germinations involving 347 ingredients.....	75	347
13	Lawn Mixtures for Purity Only.....	13	...
12	Lawn Mixtures for Germination Only; Germinations involving 53 ingredients.....	...	53
3695	Vegetables for Germination Only.....	...	3695
11	Herbs for Germination Only.....	...	11
24	Flower Seeds for Germination Only.....	...	24
7	Tree Seeds for Germination Only.....	...	7
68	Tobacco Seeds for Cleaning and Germination.....	...	68
18	Tobacco Seeds for Germination Only.....	...	18
4492		370	4792

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested respectively 299 samples of Vegetable seeds, 225 samples of Flower seeds. Results of the field tests are shown on pages 53-63.

The Seed Laboratory cleaned 86 lots of Tobacco seed and 21 lots of Onion seed for Connecticut Valley farmers. The gross weight of the 86 lots of Tobacco seed amounted to 65.95 lbs. with a net weight of cleaned seed of 51.49 lbs. Onion seed received had a gross weight of 1195 lbs. which was cleaned to a net weight of 547.78 lbs.

Explanation of Tables

Each of the following tables contains seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. Section 261-A of the Acts and Resolves of 1937 and 1938, Chapters 288 and 363, defines the group from Alfalfa to Wheat, inclusive; Section 261-B, Mixtures; Section 261-C, Special Mixtures; and Section 261-D, Vegetables.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement.

Misbranding and other irregularities are emphasized in the tables by boldface type and explained in the final column of the table or in footnotes.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except for vegetable seed found below the minimum germination standards adopted, in which instance no tolerance is allowed. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

GIVEN GERMINATION PERCENT	TOLERANCE PERCENT
96 or over.....	5
90 or over, but less than 96.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

In the determination of the tolerance for the percentage of the distinguishable kind, type, or variety (pure seed), weed seeds, other crops seeds, and inert matter, the sample shall be first considered as made up of two parts: (a) The percentage of the component (pure seed, weed seed, crop seed or inert matter as the case may be) being considered, and (b) the difference between that percentage and 100. The number represented by (a) is then multiplied by the number represented by (b) and the product is divided by 100. The resulting number is then multiplied by 0.2 (2/10) and the resulting product added to 0.2 or 0.6 as indicated in the following formulae:

$$\text{Pure seed tolerance} = 0.6 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

$$\text{Weed seeds, other crop seeds, and} \\ \text{inert matter tolerance} = 0.2 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

For *Poa* spp., *Agrostis* spp., *Festuca* spp., bromegrass, crested wheatgrass, orchard grass, velvet grass, tall oatgrass, meadow foxtail, sweet vernalgrass, Rhodes grass, Dallis grass, carpet grass, and Bermuda grass, and mixtures containing these seeds singly or combined in excess of 50 percent, an additional tolerance shall be allowed. This is to be obtained by adding to the regular tolerance mentioned above the product obtained by multiplying the regular tolerance by the lesser of "a" and "b" divided by 100.

Results of Inspection and Analyses of Field Seeds — Section 261A

Each lot of Agricultural Seeds must be labeled to show the name and variety; approximate percentage, by weight, of purity; approximate percentage, by weight, of weed seeds; approximate percentage, by weight, of noxious weed seeds present, singly or collectively, as follows: (1) in excess of one seed in each five grams of grasses, alfalfa and clovers; (2) in excess of one seed in each twenty-five grams of millets, rape and other seeds of similar size; (3) in excess of one seed in each hundred grams of wheat, oats, rye, and other seeds as large or larger than wheat; the approximate percentage of germination of such agricultural seed, and the month and year such seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Complete analysis is given; but misbranding, indicated by boldface type, is applied only to the items named above.

Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop %	Germination %	Date of Test	Violations
1006	Oats	Barber & Bennett Inc., Albany, N. Y. Frank Howard, Inc., Pittsfield Victory, No. 4286.....	L F	99.25 99.80	0.10 0.03	0.25 0.04	0.40 0.13	90.00 89.00	3 1943 8 1943
1015	Timothy	.....	L F	99.60 96.97	0.20 0.05	0.20 2.93	— 0.05	90.00 86.00	8 1942 8, 1943
1183	Alfalfa	The Bell Seed Co., Baltimore, Md. Burler Coat & Grain Co., Adams No. 572.....	L F	99.51 99.48	0.23 0.17	0.14 0.22	0.12 0.13	75-15 75-17	3 1943 8/1943
1179	Bentgrass	Astoria, No. 22-14.....	L F	98.31 97.67	0.08 0.07	1.61 2.20	— 0.06	87.00 90.00	11 1942 8, 1943
1187	Bluegrass	Canada, No. 30-11.....	L F	92.88 95.24	0.05 —	5.72 3.17	1.35 1.59	80.00 84.00	2/1943 7/1943
1177	Bluegrass	Kentucky, No. 33-12.....	L F	94.10 93.29	0.40 0.17	5.40 6.46	0.10 0.08	80.00 80.00	4 1943 7/1943

1182	Clover	Crimson, No. 99-10.....	L F	99.00 99.30	0.50 0.25	0.40 0.45	0.10	80-5 91-1	4/1943 8/1943	Noxious weeds not declared but 20 Brassica spp. per oz. found
1185F	Clover	Domestic Red, No. 87-11.....	L F	99.76 99.70	0.02 0.02	0.16 0.23	0.06 0.05	80-10 88-4	2/1943 8/1943	
1181F	Clover	Clover Red Pea Vine, No. 23515.....	L F	99.14 99.32	0.04 0.05	0.12 0.09	0.70 0.54	90-7 90-9	1/1943 8/1943	
1184	Clover	White, No. 83-12.....	L F	99.10 98.70	0.10 0.62	0.15 0.21	0.65 0.62	72-26 50-48	2/1943 8/1943	Weed seeds found excessive Germination below that stated
1180	Fescue	Chewings, No. 40-13.....	L F	98.25 98.06	0.50 0.74	0.75 0.52	0.50 0.68	91.00 90.00	4/1943 7/1943	
1190	Fescue	Cloeping Red, No. 45 10.....	L F	96.15 95.19	0.02 —	3.58 4.78	0.25 0.03	90.00 93.00	1/1943 7/1943	
1178	Redtop	No. 55-12.....	L F	98.30 98.09	0.20 0.17	1.40 1.65	0.10 0.09	92.00 92.00	4/1943 8/1943	
1189F	Ryegrass	Common, No. 18-11.....	L F	98.50 97.62	0.30 1.63	0.70 0.75	0.50	90.00 95.00	12/1942 8/1943	Weed seeds found excessive
1188F	Ryegrass	Perennial, No. 14-11.....	L F	99.61 99.30	0.08 0.19	0.10 0.51	0.21	96.00 96.00	10/1942 8/1943	
1186F	Timothy	No. 65-11.....	L F	99.60 99.64	0.05 0.05	0.30 0.22	0.05 0.09	90.00 91.00	1/1943 8/1943	Noxious weeds not declared but 9 English Plantain per oz. found
1109	Bentgrass	W. Alice Burpee Co., Philadelphia, Pa. Harry Seder, Webster Seaside, No. 604.....	L F	99.17 99.00	— 0.06	0.83 0.88	Trace 0.06	80.00 91.00	10/1942 7/1943	
1106	Alfalfa	Constock, Ferre & Co., Wethersfield, Conn. Weld & Beck, Southbridge Grimm, No. 1671.....	L F	99.00 99.03	0.20 0.09	— 0.75	— 0.13	75-15 85-6	2/1943 8/1943	
1104	Clover	Medium Red, No. 1663.....	L F	99.50 99.66	0.05 0.06	— 0.02	— 0.26	84.00 78-6	2/1943 8/1943	

Results of Inspection and Analyses of Field Seeds—Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
803F	Clover	Arthur R. Cone, Buffalo, N. Y. Community Grain Co., Worcester Medium Red, No. 15-435	99.41 98.79	0.22 0.27	0.04 0.41	0.30 0.53	82-10 80-7	2 1943 8 1943	Noxious weeds not declared but 15 English Plantain per oz. found
1210	Alfalfa	Essex County Cooperative Farming Assoc., Topsfield Grimm, No. 16-62	99.00 99.34	0.20 0.21	0.40 0.34	0.40 0.11	75-15 75-12	2/1943 8/1943	
1209	Bentgrass	Astoria, No. 100-414	98.41 98.16	0.16 0.07	1.43 1.74	— 0.03	90.00 94.00	12 1942 7 1943	
1208	Bluegrass	Kentucky, No. 34-82	88.30 81.54	0.40 0.58	11.30 17.85	— 0.03	90.00 90.00	11 1942 7 1943	Purity below that stated
1205F	Ryegrass	Perennial, No. 39-155	99.00 99.38	0.12 0.03	0.18 0.52	0.70 0.07	80.00 73.00	10 1942 8 1943	
1201	Sweet Clover	Yellow Blossom, No. 29-118	99.75 99.16	0.04 0.23	0.16 0.33	0.05 0.28	78-10 70-10	12 1942 8 1943	
1174	Corn	Farm Service Co., Middleboro Seed, Improved Leaning Type*, No. 80-856	99.50 99.90	— —	0.50 0.10	— —	90.00 68.00	3 1943 7/1943	*Variety required — "Type" not sufficient
1171	Millet	Golden, No. 38-247	98.75 98.48	0.55 0.01	0.45 1.48	0.25 —	85.00 59.00	2/1943 8 1943	Germination below that stated
1172	Millet	Hungarian, No. 38-268	98.60 98.83	1.06 0.99	0.24 0.18	0.10 —	80.00 74.00	1/1943 8/1943	Germination below that stated
1173	Millet	Japanese, No. 38-261	99.34 99.00	0.42 0.64	0.24 0.35	— —	85.00 91.00	1/1943 8 1943	
1162	Buckwheat	Sunshine Feed Store, Bridgewater Japanese, No. 65-117	98.10 98.95	0.10 0.04	1.05 0.67	0.75 0.95	90.00 95.00	4 1943 7/1943	

1163	Redtop	No. 30-130.....	L F	94.05 94.01	0.30 0.46	5.60 5.38	0.05 0.15	97.00 90.00	1, 1943 8, 1943
1161	Rye	Spring, No. 85-147 (*).....	L F	98.01 98.56	0.01 —	0.37 0.38	1.61 0.96	88.00 88.00	2, 1943 8, 1943
871	Clover	Sunshine Feed Store, Westfield Alsike, No. 25-327.....	L F	98.42 97.88	0.48 0.99	0.35 0.39	0.75 0.74	82-10 76-12	1, 1943 8, 1943
868F	Clover	Medium Red, No. 15-426.....	L F	99.05 98.88	0.39 0.64	0.41 0.19	0.15 0.29	80-14 92-5	1, 1943 8, 1943
870	Corn	Westbranch Sweepstakes, No. 80-845.....	L F	99.50 99.90	— —	0.50 0.10	— —	90.00 90.00	3, 1943 7, 1943
869	Oats	Victory, No. 36-169.....	L F	98.75 98.58	— 0.32	0.50 0.10	0.75 1.00	92.00 96.00	4, 1943 8, 1943
867F	Timothy	No. 10-407.....	L F	99.60 99.75	0.05 0.15	0.15 0.10	0.20 —	90.00 91.00	2, 1943 8, 1943
773F	Clover	Worcester Grain & Coal Co., Worcester Medium Red, No. 15-425.....	L F	99.26 99.00	0.28 0.24	0.24 0.36	0.22 0.30	80-10 80-3	1, 1943 8, 1943
1030	Mialia	Craver-Dickinson Co., Buffalo, N. Y. Checkerboard Feed Store, North Adams Grimm, No. 27-50.....	L F	99.42 99.34	0.18 0.13	0.06 0.24	0.34 0.29	78-13 92-2	3/1942 8, 1943
1001	Clover	Frank Howard, Inc., Pittsfield Crimson, No. 22-4.....	L F	99.72 99.85	0.10 0.04	0.17 0.09	0.01 0.02	85.00 87-1	3, 1943 8, 1943
1002	Clover	Ladino, No. 26-2104.....	L F	99.00 98.72	0.54 0.80	0.36 0.19	0.10 0.29	88-3 94-6	3, 1943 8, 1943
1198	Corn	Middlesex Co. Farm Bureau Assoc., Waltham West Branch Sweepstakes, No. 72-365.....	L F	99.00 98.90	— —	1.00 1.10	— —	90.00 94.00	5, 1943 7, 1943
1018	Corn	Stanley's Coal & Grain Co., Adams Leaning Type, Variety Unknown..... No. 72-381	L F	99.50 99.90	— —	0.50 0.10	— —	92.00 88.00	3, 1943 7, 1943

*Variety required — "Spring" is not a variety

Noxious weeds not declared but
3 Canada Thistle and 5 English
Plantain per oz. found.
Weed seeds found excessiveWeed seeds not declared but
found excessiveNoxious weeds not declared but
18 English Plantain per oz. foundNoxious weeds not declared but
10 English Plantain and 1 Brassica
arvensis per oz. found

Results of Inspection and Analyses of Field Seeds—Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germi- nation %	Date of Test	Violations
920	Alfalfa	Eastern States Farmers' Exchange, Springfield, Mass. Eastern States Farmers' Exchange, Great Barrington Variegated, No. 1045.....	L F 99.30 99.21	0.35 0.21	0.10 0.23	0.25 0.35	63.27 76.19	12, 1942 8, 1943	
923	Barley	Wisconsin No. 38-Smooth Bearded, No. 997.....	L F 99.25 99.76	0.10 —	0.50 0.16	0.15 0.08	92.00 98.00	12, 1942 8, 1943	
921	Bluegrass	Kentucky, No. 7671.....	L F 90.40 89.94	0.40 0.19	9.00 9.87	0.20 —	72.00 71.00	2, 1943 7/1943	
922	Corn	Hybrid, U. S. No. 13, No. 6831.....	L F 99.25 99.90	— —	0.75 0.10	— —	92.00 97.00	1, 1943 7/1943	
925	Oats	Selected, Variety Unknown, No. 8501.....	L F 98.00 98.43	0.10 0.05	0.65 1.47	1.25 1.47	92.00 97.00	12, 1942 8, 1943	
919F	Redtop	Fancy, Solid, No. 7541.....	L F 98.00 98.32	0.20 0.30	1.70 1.38	0.10 —	92.00 94.00	12, 1942 8/1943	
924	Soy Beans	Dunfield, No. 1060.....	L F 99.25 99.80	— —	0.70 0.20	0.05 —	82.00 82.00	3/1943 7/1943	
918F	Timothy	Lot, No. 996.....	L F 99.60 99.68	0.05 0.06	0.25 0.22	0.10 0.04	90.00 93.00	12, 1942 8, 1943	
646F	Clover	Templeton Farmers Cooperative Assoc., Inc., Templeton Medium Red, No. 1021.....	L F 99.45 99.41	0.15 0.26	0.10 0.02	0.30 0.31	78.15 82.13	1/1943 8/1943	
1203	Barley	Thomas W. Emerson Co., Beverly, Mass. Essex County Cooperative Farming Assoc., Topsfield 4 Row.....	L F 99.81 98.63	0.01 0.01	0.11 1.08	0.07 0.28	95.00 94.00	1/1943 8/1943	Purity below that stated

259	Beet	Charles C. Hart Seed Co., Wethersfield, Conn. W. K. Gilmore & Sons, Inc., Medfield Mangel, Giant Long Red.....	L F	* 99.82	— —	— 0.18	— —	74.00 57.00	1/1943 6/1943	*Variety required but not stated Germination below that stated
943	Corn	Carr Hardware Co., Pittsfield Improved Leaning.....	L F	99.00 99.95	— —	— 0.05	— —	90.00 91.00	3/1943 7/1943	
1196	Bluegrass	John D. Lyon, Inc. Belmont Mass. Middlesex County Farm Bureau, Assoc., Waltham Kentucky.....	L F	87.25 91.79	0.25 0.09	12.45 8.08	0.05 0.04	85.00 86.00	2/1943 7/1943	
1129	Buckwheat	(*).....	L F	99.00 99.08	0.25 0.12	0.25 0.18	0.50 0.02	90.00 98.00	4/1943 7/1943	*Variety required but not stated Japanese buckwheat found
1193	Clover	Alsike, No. 200.....	L F	98.72 94.74	0.33 0.08	0.81 0.17	0.14 5.01	Over 90.00 85-9	* * 8/1943	*#Date of test required Purity below that stated
1192F	Clover	Medium Red, No. 202.....	L F	99.23 97.14	0.08 0.32	0.24 0.20	0.42 2.34	Over 88-7 89-4	* * 8/1943	*#Date of test required Purity below that stated
1128	Millet	Japanese, No. 12507.....	L F	97.53 98.10	1.25 1.40	0.75 0.50	0.45 Trace	75.00 85.00	1/1943 8/1943	
1197	Peas	Canada Field.....	L F	97.80 98.20	0.78 —	1.41 —	0.01 0.32	89.00 87.00	2/1943 7/1943	
1194	Rape	Dwarf Essex.....	L F	99.50 99.50	0.05 —	0.45 0.50	— —	90.00 96.00	2/1943 8/1943	
1195	Ryegrass	Domestic.....	L F	99.00 99.70	0.40 0.13	0.60 0.17	— —	90.00 93.00	2/1943 8/1943	
1130F	Timothy	Middlesex County Farm Bureau Assoc., So. Weymouth	L F	99.60 99.64	0.10 0.07	0.30 0.26	— 0.03	90.00 95.00	11/1942 8/1943	
864	Corn	The Page Seed Co., Greene, N. Y. The O. B. Parks Co., Westfield Page's Longfellow, No. 2245.....	L F	99.00 99.95	— —	— 0.05	— —	90.00 77.00	1/1943 7/1943	Germination below that stated
926	Corn	Platt & Goslee, Great Barrington Page's Westbranch Sweepstakes..... No. 3150.....	L F	99.00 99.95	— —	— 0.05	— —	90.00 84.00	4/1943 7/1943	

Results of Inspection and Analyses of Field Seeds—Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number; Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Inert Seed Matter %	Other Seeds %	Germination %	Date of Test	Violations	
The Page Seed Co.—Continued									
1112	Corn	Henry Seider, Webster Page's Early Eureka, No. 3115.	L 99.00 F 99.95	— —	— —	— 92.00 — 93.00	2 1943 7 1943		
1020	Millet	Stanley's Coal & Grain Co., Adams Hungarian, No. J 6 N 43	L 99.48 F 99.30	0.38 0.14 0.34	— — 0.09	— 80.00 77.00	1 1943 8 1943	Approx.	
1063	Oats	Ralston Purina Co., St. Louis, Mo. (Checkerboard Feed Store, Amberst Selected Swedish Type, No. 501 Variety Unknown.....)	L 98.00 F 98.95	0.30 0.05	1.00 0.85	93.00 96.00	3 1943 8 1943		
1105	Corn	Ross Bros., Co., Worcester, Mass. Wild & Beck, Southbridge Worcester County Sweepstakes.....	L 98.00 F 99.20	— —	— 0.80	— 90.00 80.00	1 1943 7 1943	Germination below that stated	
1168	Clover	Wm. G. Scarlett & Co., Baltimore, Md. C. P. Washburn Co., Middleboro Alsike, No. 3877.....	L 98.00 F 98.53	0.50 0.77	1.50 0.55	— 70.20 85.8	2 1943 8 1943	Noxious weeds not declared but 41 English Plantain per oz. found	
1170	Corn	Yellow Learning, No. 23733.....	L 98.00 F 99.85	0.20 —	1.80 0.15	— 90.00	2 1943 7 1943		
1165	Millet	Hungarian, No. 4580.....	L 99.00 F 99.19	0.70 0.51	0.30 0.30	— 70.00 76.00	2 1943 8 1943		
1167	Rape	Dwarf Essex, No. 2551.....	L 99.50 F 99.87	0.13 0.13	— —	— 98.00	1 1943 8 1943		
1169	Redtop	No. 2669.....	L 91.30 F 87.26	0.50 0.48	5.50 7.77	2.70 4.49	90.00 89.00	1 1943 8 1943	Purity below that stated
1166F	Timothy	No. 2855.....	L 99.50 F 98.97	0.20 0.07	0.30 0.94	— 0.03	90.00 95.00	3 1943 8 1943	

1164	Millet	Seaboard Seed Co., Philadelphia, Pa. Sunshine Feed Store, Bridgeville Japanese Patriot, No. M 22	L F	99.28 91.67	0.35 7.18	0.37 1.15	— —	95.00 90.00	11 8	1942 1943	Purity below that stated. Weed seeds found excessive
1064	Millet	The Stamford Seed Co., Buffalo, N. Y. Checkerboard Feed Store, Amherst Japanese, No. 5311	L F	98.70 98.82	1.26 1.27	0.04 0.21	— —	85.00 85.00	2 8	1943 1943	
963F	Timothy	Checkerboard Feed Store, Pittsfield No. 2075	L F	99.61 99.62	0.04 0.05	0.27 0.24	0.08 0.09	90.00 92.00	2 8	1943 1943	
866	Clover	The O. R. Pinks Co., Westfield Alsike No. 2219	L F	97.50 98.00	0.30 0.68	0.50 0.69	1.70 1.23	80-10 85-10	3 8	1943 1943	
865F	Timothy	No. 2099	L F	99.60 99.70	0.05 0.03	0.25 0.21	0.10 0.05	92.00 92.00	1 8	1943 1943	
900	Clover	W. N. Potter Grain Store, Huntington Alsike, No. 5357	L F	97.05 97.24	0.30 0.67	0.24 0.26	2.51 1.83	79-12 80-16	2 8	1943 1943	Weed seeds found excessive
898	Corn	Leaming, No. 2484	L F	99.00 99.90	— —	1.00 0.10	— —	* 91.00	3 7	1943 1943	*Germination required but not stated
899F	Timothy	No. 2228	L F	99.61 99.78	0.10 0.04	0.24 0.09	0.05 0.09	90.00 95.00	1 8	1943 1943	
946	Bluegrass	Whitney Seed Co., Buffalo, N. Y. Carr Hardware Co., Pittsfield Kentucky, No. 36518	L F	86.29 88.46	0.20 0.82	13.50 10.63	0.10 0.09	80.00 69.00	1 7	1943 1943	Weed seeds found excessive Germination below that stated
945	Clover	Domestic Medium Red, No. 50513	L F	99.03 99.15	0.22 0.09	0.15 0.20	0.60 0.56	82.7 87-1	2 8	1943 1943	
1062	Corn	Checkerboard Feed Store, Amherst Lancaster Sine Corp No. 70324	L F	99.00 99.95	— —	1.00 0.05	— —	85.00 90.00	3 7	1943 1943	
961	Alfalfa	Checkerboard Feed Store, Pittsfield Canada Grimm, No. 21515	L F	99.04 98.80	0.10 0.54	0.28 0.19	0.58 0.47	78-13 71-22	2 8	1943 1943	Weed seeds found excessive

Results of Inspection and Analyses of Field Seeds—Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Seed %	Germination %	Date of Test	Violations
Whitney Seed Co.—Continued									
Checkerboard Feed Store, Westfield									
872F	Clover	Mammoth Red, No. 5156.....	L 99.28 F 99.14	0.20 0.20	0.30 0.22	0.22 0.44	81.7 83.8	2, 1943 8, 1943	Noxious weeds not declared but 15 English Plantain per oz. found
873F	Clover	Medium Red, No. 5055.....	L 99.10 F 98.67	0.44 0.48	0.22 0.24	0.24 0.60	81.9 79.7	2, 1943 8, 1943	Noxious weeds not declared but 24 English Plantain per oz. found
874F	Redtop	Fancy, No. 4058.....	L 95.40 F 95.88	0.30 0.26	3.90 3.60	0.40 0.26	90.00 84.00	1, 1943 8, 1943	
Essex County Cooperative Farming Assoc., Topsfield									
1207	Bluegrass	Canada, No. 3757.....	L 88.80 F 90.12	0.10 —	10.90 7.81	0.20 2.07	80.00 82.00	3, 1943 7, 1943	
1206F	Ryegrass	Perennial, No. 4352.....	L 99.40 F 99.11	0.42 0.30	0.44 0.46	0.10 0.03	90.00 91.00	1, 1943 8, 1943	Analysis as stated exceeds 100%
Frank Howard, Inc., Pittsfield									
1000	Redtop	Extra Fancy, No. 40620.....	L 98.00 F 97.87	0.20 0.39	1.70 1.74	0.10 —	90.00 95.00	2, 1943 8, 1943	
999F	Ryegrass	Domestic, No. 4457.....	L 99.58 F 99.87	0.36 0.05	0.06 0.08	0.02 —	90.00 97.00	2, 1943 8, 1943	
Frank P. Mills, Campello									
1160	Clover	Alsike, No. 15510.....	L 99.40 F 99.78	0.20 0.11	0.20 0.07	0.20 0.04	86.4 90.4	1, 1943 8, 1943	
1157	Millet	Golden, No. 4751.....	L 99.36 F 99.72	0.02 —	0.44 0.21	0.18 0.07	82.00 76.00	2, 1943 8, 1943	
1154	Millet	Hungarian, No. 4853.....	L 98.54 F 98.99	1.14 0.57	0.22 0.36	— 0.08	85.00 76.00	5, 1942 8, 1943	Germination below that stated
1158	Millet	Japanese, No. 4652.....	L 99.00 F 99.37	0.42 0.50	0.04 0.13	0.54 —	85.00 86.00	1, 1943 8, 1943	

1156	Soy Beans	Manchu, No. 6616.....	L F	99.00 99.25	0.05 —	0.95 0.65	— 0.10	85.00 89.1	2/1943 7/1943
1155	Redtop	Fancy, No. 40516.....	L F	94.10 94.36	0.30 0.25	5.40 5.26	0.10 0.13	90.00 92.00	2/1943 8/1943
1153F	Timothy	No. 12511.....	L F	99.70 99.85	0.05 0.03	0.20 0.07	0.05 0.05	93.00 79.00	2/1943 8/1943
1159	Vetch	Spring, No. 6715.....	L F	99.14 97.28	— —	0.13 0.30	0.73 2.42	90.00 96.3	12/1942 8/1943
1191F	Timothy	F. H. Woodruff & Sons, Milford, Conn. Middlesex County Farm Bureau Assoc., Waltham No. 330-227.....	L F	99.75 99.75	0.05 0.05	0.20 0.10	— 0.10	95.00 94.00	2/1943 8/1943

Germination below that stated

Purity below that stated

Results of Inspection and Analyses of Mixtures—Section 261B

Each Mixture of Agricultural Seeds which contains not more than two kinds, each of which is present in excess of five percent by weight, must be labeled to show that such seed is a mixture; the name, variety and approximate percentage by weight of each kind present in excess of five percent by weight of the total mixture; approximate total percentage by weight of weed seeds; name and approximate number per ounce of noxious weed seeds present singly or collectively in excess of one seed in each fifteen grams of such mixture; the approximate percentage of germination of each kind of agricultural seed present in excess of five percent by weight, together with the month and year said seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Complete analysis is given, but misbranding, which is indicated by boldface type, is applied only to the items named above.

The name and address of the wholesaler are printed in boldface type.

Lab No	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Ingredients		Germination		Pure Seed	Weed Seed	Inert Matter	Other Crop Seed	Date of Test	Violations
		Label	Found	Label	Found						
1019	Arthur R. Cone, Buffalo, N. Y. Stanley's Coal & Grain Co., Adams *Medium Red Clover, No. 15-425	Ingredients:									
		Red Clover	99.26	83.83	80-10	91-5	99.26	0.28	0.24	0.22	1 1943	Noxious weeds not declared but
		Alfalfa		15.37	73-42	99.20	0.22	0.25	0.33	8 1943	12 English Plantain 1 Dodder, 1 Brassica arvensis per oz. found
967	Whitney Seed Co., Buffalo, N. Y. Checkerboard Feed Store, Pittsfield Timothy & Alsike, Lot No. 11-4	Ingredients:									
		Timothy	76.85	78.72	85.00	80.00	97.00	0.30	0.95	1.75	2 1943	Noxious weeds not declared but
		Alsike	20.15	19.11	72-21	71-14	97.83	0.40	1.17	8 1943	8 English Plantain and 1 Canada Thistle per oz. found

*Labeled Red Clover, but found to be a Red Clover-Alfalfa Mixture.

Results of Inspection and Analyses of Mixtures—Section 261 C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Ingredients		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label Found	Label Found							
948	Atlantic Distributing Co., Inc., Lowell, Mass. Pittsfield Hardware & Plumbing Supply Co., Pittsfield Riverside Park Lawn Grass Seed, No. G-28,	L	F	89.66	1.50	0.28	14.50	0.27	1/1943 7/1943	10,200 Mouse Ear, 8900 Buckhorn, 12,800 Dock, 14,000 Sheep Sorrel per lb. declared. None found.
	Ingredients:									
	Kentucky Bluegrass.....	1.50	80.00	52.00						Germination below that stated
	Redtop.....	5.00	6.50	70.00						Germination below that stated
	Timothy.....	48.00	50.51	70.00						
	Common Ryegrass.....	29.50	31.35	90.00						
680	W. E. Aubuchon Co., Inc., Fitchburg, Mass. Central Hardware Co., Fitchburg Evergreen Lawn Grass Seed.....	L	F	93.24	0.25	0.18	4.68	0.08	1/1943 6/1943	
	Ingredients:									
	Kentucky Bluegrass.....	2.75	2.92	80.00						
	Redtop.....	28.66	26.99	90.00						
	Timothy.....	58.58	59.67	90.00						
	White Clover.....	4.25	3.66	80.00						
1014	Butler Bros., Chicago, Ill. F. E. Braman Co., Adams Belmont Lawn Seed Mixture.....	L	F	95.81	0.80	0.32	13.90	0.15	1/1942 6/1943	3 Sorrel, 2 Buckhorn per oz. declared None found
	Ingredients:									
	Kentucky Bluegrass.....	11.20	12.95	78.00						Exceeds percentage declared
	Redtop.....	19.02	23.49	80.00						Exceeds percentage declared
	Timothy.....	16.02	20.85	80.00						Declared but not found
	White Clover.....	0.80	75.00							
	Domestic Ryegrass.....	38.11	38.52	90.00						
808	Community Grain Co., Worcester, Mass. Emerald Green, No. AMS 81.....	L	F	93.32	0.42	0.41	7.10	0.33	2/1943 6/1943	
	Ingredients:									
	Kentucky Bluegrass.....	16.40	16.54	80.00						
	Redtop, Fancy.....	32.20	33.44	90.00						
	Timothy.....	14.70	14.83	90.00						
	White Clover.....	1.96	2.83	70.22						
	Domestic Ryegrass.....	27.22	25.68	90.00						

Doughten Seed Co., Jersey City, N. J.

Winners Hardware, Inc., Whitman
Winner's Own Lawn Mixture, No. B T 6750

1135

Ingredients:				
Kentucky Bluegrass.....	35.01	80.00		
Redtop.....	44.16	90.00		
Chewings Fescue.....	9.84	70.00		
Colonial Bent.....	4.96	90.00		
Agrostis spp.....				
(Redtop and Colonial Bent)	51.97		93.00	

Germination below that stated

Eastern Seed Co., New York, N. Y.

Maynard Supply Co., Maynard
Kew Gardens, No. 0306 — AMS 41

747

Ingredients:				
Kentucky Bluegrass.....	17.33	30.02	85.00	82.00
Redtop, Fancy.....	44.82		90.00	
Astoria Bent.....	5.00		92.00	
Domestic Ryegrass.....	22.00		90.00	90.00
Agrostis spp.....				
(Redtop and Seaside Bent)	38.35			70.00

Exceeds percentage declared

Declared but not found

Less than percentage declared
Germination below that stated
Seaside Bent found but not declared

Eastern States Farmers' Exchange, Springfield, Mass

Templeton Farmers' Coop. Assoc., Templeton
Velvet Green Lawn Mixture, No. 985

645

Ingredients:				
Kentucky Bluegrass.....	30.45	80.00		
Chewings Fescue.....	24.37	76.00	88.00	
R. I. Bent.....	14.66	15.01	94.00	94.00
Domestic Ryegrass.....	14.85	15.43	95.00	94.00
Creeping Red Fescue.....	9.82	8.20	83.00	95.00

641 Hyland Mixture, No. 2-984

Ingredients:				
Redtop.....	14.70	14.50	90.00	90.00
Timothy.....	29.85	30.99	90.00	88.00
Medium Red Clover.....	24.87	24.72	85-5	85-4
Alsike Clover.....	29.76	29.16	80-10	87-9

94.15 0.45 4.90 0.50 1.2 1942
95.76 0.42 3.75 0.07 6 1943

99.18 0.15 0.47 0.20 7/1942
99.37 0.10 0.34 0.19 5/1943

Results of Inspection and Analyses of Mixtures—Section 261 C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Inert Matter %		Weed Seed %		Pure Seed %		Germination %		Inedredients %		Label Found		Date of Test	Remarks
		%	%	%	%	%	%	%	%	%	%	%	%		
629	Edgewood Farms, Inc., Ridgefield, N. J. Leader Stores, Springfield Thrillite Green Mixture			9.17	0.45	93.17		L						1 1943	12 Sorrel per oz. declared
	Ingredients:			6.12	0.63	6.12		F						5 1943	None found
	Kentucky Bluegrass.....	19.86	21.33	70.00											
	Redtop.....	31.73	35.53	85.00											
	White Dutch Clover.....	1.92	2.12	65.00											
	Domestic Ryegrass.....	36.87	34.19	90.00											
556	Thomas W. Emerson Co., Beverly, Mass. J. William Gove, Inc., Foxboro J. Shady Park Mixture			10.00	1.00	96.09		L						**	Date of test required but not stated
	Ingredients:			2.61	1.30	2.61		F						5 1943	
	Kentucky Bluegrass.....	57% of 80.00D**	8.20	80.00											Exceeds percentage declared
	Redtop.....	20% of 98.00D**	25.36	86.00											Exceeds percentage declared
	Timothy.....	5% of 98.00D**	4.42	85.00											
	White Clover.....	5% of 99.00D**	2.92	95.00											
	Meadow Fescue.....	20% of 94.00D**	9.91	90.00											Germination and percentage less than stated
	Domestic Ryegrass.....	40% of 98.00D**	40.15	70.00											Declared but not found
	R. S. Meadow Grass.....	5% of 90.00D**	5.10	90.00											Found but not declared
	Chewings Fescue.....			36.00											
776	Ferry-Morse Seed Co., Detroit, Mich. White Hardware Co., Worcester Fine Mixed CO 3119			3.86	0.21	96.24		L						1 1943	
	Ingredients:			3.42	0.32	3.42		F						6 1943	
	Kentucky Bluegrass.....	53.55	51.11	80.00											
	Redtop Fancy.....	28.29	30.48	89.00											
	White Clover.....	3.97	4.02	61.34											
	Domestic Ryegrass.....	10.12	10.43	94.00											
731	Fredonia Seed Co., Fredonia, N. Y. Bryant's Hardware Co., Haverhill Veltex Grass Seed Mixture			14.75	0.90	85.83		L						1/1943	
				12.67	0.62	12.67		F						6/1943	

1238	Ingredients: Kentucky Bluegrass... Redtop... Timothy... Domestic Ryegrass...	15.40 25.73 21.35 21.87	14.95 27.05 22.89 20.94	70.00 75.00 80.00 80.00	77.00 89.00 74.00 88.00	L F	92.97	0.65 0.36	7.75 6.60	— 0.07	* #	7/1943	#/Date of test required but not stated
	Garfield Williamson Inc., Jersey City, N. J. Simmon's Hardware Co., Fall River Wonderlawn, No. W 40-3												
	Ingredients: Kentucky Bluegrass... Redtop, Fancy... Seaside Bent... Domestic Ryegrass... Agrostis spp. (Redtop and Colonial Bent)	*	24.28	*	77.00								Declared but not found
	Charles C. Hart Seed Co., Wethersfield, Conn. Carr Hardware Co., Pittsfield Elm Tree H 143												Colonial Bent found but not declared
1023	Ingredients: Kentucky Bluegrass... Redtop, Fancy... Domestic Ryegrass...	29.75 31.50 29.70	30.57 32.68 28.02	80.00 90.00 90.00	75.00 87.00 82.00	L F	91.27	0.45 0.23	8.60 8.42	— 0.08	* #	3/1943 7/1943	
	Lev Hardware & Plumbing Supply Co., Adams Shady Nook Mixture, No. R. 143												
	Ingredients: Kentucky Bluegrass... Redtop... Timothy... Chewings Fescue... Domestic Ryegrass...	12.75 30.25 9.77 9.80 24.50	12.81 33.58 11.20 8.58 24.25	81.00 90.00 90.00 75.00 90.00	76.00 86.00 82.00 91.00 94.00	L F	90.42	0.72 0.25	12.21 9.20	— 0.13	* #	3 1943 6 1943	Germination below that stated
1144	Jack & Harry's, Inc., Brockton, Mass. Fair Lawn Mixture, No. G 12-222-AMS 1												
	Ingredients: Kentucky Bluegrass... Fancy Redtop... Chewings Fescue... Common Ryegrass...	21.00 21.40 24.00 24.50	22.03 19.05 26.45 24.52	80.00 90.00 70.00 90.00	87.00 84.00 95.00 92.00	L F	92.05	0.50 0.40	8.60 7.47	— 0.08	* #	2/1943 7 1943	

** Purity. Formula incorrectly stated. (P***) does not express percentage of pure seed as required.
* Percentage and Germination of each kind of seed required by law but not stated.

Results of Inspection and Analyses of Mixtures—Section 261 C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Ingredients		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date Test	Remarks
		Label Found	Label Found							
764	J. Oliver Johnson Seed Co., Chicago, Ill. Spag's Hardware Co., Shrewsbury J. O. J. Special			L F	90.53	1.00 0.32	9.80 8.18	— 0.97	2 1943 5 1943	
	Ingredients:									
	Redtop, Fancy	10.00	8.34	80.00	85.00					
	Timothy	60.39	62.87	80.00	81.00					
	Domestic Ryegrass	18.81	19.32	90.00	91.00					
1016	Stanley's Coal & Grain Co., Adams West Park Mixed Grass Seed			L F	83.42	1.00 0.84	13.22 14.25	0.50 1.49	2 1943 6 1943	Germination below that stated
	Ingredients:									
	Redtop, Fancy	13.50	14.16	90.00	82.00					
	Timothy	61.38	57.63	80.00	81.00					
	White Clover	0.50	1.04	80.15	69.29					
	Domestic Ryegrass	9.90	10.59	90.00	93.00					
1040	S. S. Kresge Co., Boston, Mass. Kresge's Shady Place Mixture, Grade D. AMS 1101			L F	91.80 92.15	0.50 0.59	7.70 7.13	— 0.13	2 1941 7 1943	Germination below that stated
	Ingredients:									
	Kentucky Bluegrass	16.00	17.11	75.00	78.00					
	Redtop	13.50	15.39	85.00	86.00					
	Perennial Ryegrass	10.00	—	90.00	—					
	Domestic Ryegrass	34.30	—	—	—					
	Poa Trivialis	19.16	—	80.00	32.00					
	Lolium spp. (Perennial Ryegrass and Domestic Ryegrass)	40.49	—	—	92.00					
618	D. Landreth Seed Co., Bristol, Pa. Frank L. Whitcomb, Amherst Never Die Lawn Grass Seed 3-E-6			L F	— 88.66	0.40 0.69	10.46 11.06	0.13 0.19	3 1943 5 1943	Germination below that stated
	Ingredients:									
	Kentucky Bluegrass	51.20	52.71	81.00	82.00					
	Redtop, Fancy	28.00	24.53	90.00	89.00					
	White Clover	4.83	5.14	54.00	66-30					
	Chewings Fescue	4.98	6.28	88.00	88.00					

Middlesex County Farm Bureau Assoc., Waltham, Mass.

695

Middlesex County Farm Bureau Assoc., Lowell Sunny Spot Lawn Seed Mixture.....	L	93.00	0.05	6.50	—	2/1943
	F	93.70	0.19	5.63	0.48	6/1943
Ingredients*:						
Kentucky Bluegrass.....		18.00		85.00	78.00	Germination and amount below that stated
Redtop, Fancy.....		30 lb.		90.00	—	
25 lb.		8.67		85.00	48.00	Germination and amount below that stated
Chewings Fescue.....		20 lb.		90.00	—	
5 lb.		11.90		90.00	95.00	
Colonial Bent.....		20 lb.		90.00	94.00	
Domestic Ryegrass.....		36.19		—	—	
Agrostis spp.....		—		—	—	
(Redtop and Colonial Bent)		—		—	—	
Timothy.....		14.28		—	87.00	Found but not declared
White Clover.....		4.66		—	60.38	Found but not declared

Northrup, King & Co., Minneapolis, Minn.

M. N. Landau, Inc., Westfield Home Lawn Grass Seed, No. W. G. 1.....	L	86.30	0.80	12.76	—	1/1942 2 Dock and 2 Sorrell per oz. declared
	F	86.30	0.47	12.83	0.40	7/1943 None found

885

Ingredients:

Kentucky Bluegrass.....	11.73	10.94	80.00	80.00
Redtop.....	19.32	17.32	89.00	89.00
Timothy.....	16.34	14.57	76.00	76.00
White Clover.....	1.92	1.66	67.23	67.23
Domestic Ryegrass.....	37.13	41.81	95.00	90.00

The Page Seed Co., Greene, N. Y.

Clifford Coal Co., Inc., Lenox
Special Mixture, Page's Marvelawn, No. L 146643.....

980

L	93.44	0.60	5.36	0.60	2/1943
F	93.87	0.31	5.59	0.23	6/1943
Ingredients:					
Kentucky Bluegrass.....	22.03	23.45	75.00	78.00	
Redtop.....	29.46	28.05	92.00	91.00	
Timothy.....	10.97	10.11	92.00	90.00	
White Clover.....	4.87	4.36	66.24	61.37	
Meadow Fescue.....	12.31	12.11	90.00	90.00	
Perennial Ryegrass.....	13.80	15.79	96.00	97.00	

Pedigreed Seed Co., New York City, N. Y.

Jaife Hardware & Paint Co., Worcester Lawn Mixture, No. 0301.....	L	88.33	0.80	13.43	0.70	2 1943 Noxious weeds not declared but
	F	88.33	0.97	10.62	0.03	5, 1943 4 English Plantain per oz found

774

Ingredients:

Kentucky Bluegrass.....	2.43	3.70	85.00	81.00
Redtop, Fancy.....	14.78	16.41	90.00	89.00
Timothy.....	52.76	51.41	90.00	90.00
White Clover.....	0.25	0.64	85.00	84.14
Domestic Ryegrass.....	14.85	16.17	90.00	92.00

* Entire formula given in pounds instead of percentage of pure seed by weight as required

Results of Inspection and Analyses of Mixtures—Section 261 C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks	
		Label	Found	Label	Found							
883	Philadelphia Seed Co., Philadelphia, Pa. Concord Hardware & Plumbing Supply Co., Concord Lawn Mixture, No. 616.....			L	F					1-1943		
		Ingredients:				90.13	0.50	8.50	—	—	6 1943	
		Kentucky Bluegrass.....	20.00	18.50	80.00	78.00						
		Redtop Fancy.....	41.50	39.82	90.00	91.00						
		Timothy.....	9.50	12.49	88.00	88.00						
		White Clover.....	1.00	0.78	60.25	65.23						
	Common Ryegrass.....	19.00	18.54	90.00	93.00							
1252	I. L. Radwaner Seed Co., Inc., New York, N. Y. Rose Hardware Co., Somerville Competition Park, Central Mixture, No. 22.....			L	F					1 1943		
		Ingredients:				86.24	1.78	11.44	0.54	3.05	7. 1943	Weed seeds excessive
		Redtop.....	11.00	20.23	80.00	75.00						
		Timothy.....	50.45	49.44	80.00	81.00						
		Italian Ryegrass.....	19.60	—	80.00	—						
		Domestic Ryegrass.....	—	16.57	—	90.00						Exceeds percentage declared Declared but not found Found but not declared
1178	Sam W. Pili, Cambridge Parklawn Code 2 X-Code 24.....			L	F					3 1943		
		Ingredients:				83.98	0.90	16.00	3.05	0.64	7/1943	
		Redtop.....	10.00	80.95	80.00	81.00						
		Timothy.....	50.45	51.03	80.00	34.00						
		Italian Ryegrass.....	19.60	—	80.00	—						
		Domestic Ryegrass.....	—	20.00	80.00	94.00						Germination below that stated Declared but not found Found but not declared
765	Ross Bros. Co., Worcester, Mass. Spag's Hardware Co., Shrewsbury Worcester Lawn Seed.....			L	F					2-1943	*Percentage of weed seeds and inert matter required	
						96.60	0.30	3.00	0.10	0.10	5/1943	

Results of Inspection and Analyses of Mixtures—Section 261 C—Continued

Lab. No.	Wholesale Distributor; Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Ingredients		Germination		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks	
		Label	Found	Label	Found							
786	Western Auto Supply Co., Kansas City, Mo. Western Auto Supply Co., Worcester Sturdy Gro Estate-Grade D Mo. Permit 55											
				L		0.72	6.70	0.10	3, 1943	15 Sorrel, 15 Dock, 30 Backhorn per lb. declared		
				F		0.74	7.92	0.23	5, 1943	9 English plantain per oz. found		
		Ingredients:										
		Kentucky Bluegrass	15.04	13.10	80.00	70.00						Germination below that stated
		Redtop, Fancy	31.76	31.01	90.00	85.00						Germination below that stated
633	Whitney Seed Co., Buffalo, N. Y. Mutual Plumbing & Heating Co., Amherst Greenvue Grass Seed, No. X 28											
				L		1.00	13.00	2.50	1/1943	12 Buckhorn, 8 plantain, 20 Sorrel per lb. declared		
				F		0.32	13.17	0.24	5/1943	3 English Plantain per oz. found		
		Ingredients:										
		Kentucky Bluegrass	12.00	12.92	80.00	77.00						Germination below that stated
		Redtop	21.15	21.67	90.00	86.00						Germination below that stated
746	F. H. Woodruff & Sons, Milford, Conn. Treat Hardware Co., Lawrence Royal Mixture											
				L		0.50	8.80	—	2, 1943			
				F		0.20	7.24	0.07	6, 1943			
		Ingredients:										
		Kentucky Bluegrass	38.50	36.72	80.00	88.00						Germination below that stated
		Redtop	23.00	—	90.00	—						Germination below that stated
746	F. H. Woodruff & Sons, Milford, Conn. Treat Hardware Co., Lawrence Royal Mixture											
				L		0.50	8.80	—	2, 1943			
				F		0.20	7.24	0.07	6, 1943			
		Ingredients:										
		Kentucky Bluegrass	38.50	36.72	80.00	88.00						Germination below that stated
		Redtop	23.00	—	90.00	—						Germination below that stated

S. D. Woodruff & Sons, Orange, Conn.

Baker Hardware Co., Wellesley
Velvet Lawn Seed.....

413

L	93.58	1.00	6.00	0.09	1 1943
F		0.40	5.93		5, 1943

Ingredients:

Kentucky Bluegrass.....	15.00	17.48	80.00	71.00	
Redtop.....	28.00	32.57	95.00	90.00	Germination below that stated
Timothy.....	23.00	22.23	90.00	90.00	
Domestic Ryegrass.....	28.00	21.30	90.00	82.00	Less than percentage declared

Unknown**

Adams Hardware & Paint Co., Lowell
Splendorlawn Shady, No. 292.....

691

L	88.42	0.75	10.00	0.50	2 1941
F		0.51	10.71	0.36	6 1943

Ingredients:

Kentucky Bluegrass.....	7.00	7.82	75.00	47.00	
Redtop, Fancy.....	33.00	37.12	90.00	94.00	Germination below that stated
Timothy.....	7.00	7.39	90.00	65.00	Germination below that stated
Chewings Fescue.....	12.00	9.10	85.00	56.00	Germination below that stated
Domestic Ryegrass.....	29.75	26.99	90.00	96.00	

**Wholesaler not named because retailer admits, or wholesaler claims, that the following mixture was not purchased by the retailer during the current year.

Results of Inspection and Germination of Vegetable Seeds Section 261-D

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety; the percentage of germination, with the month and year tested, provided the germination is below the Massachusetts Standard; and the name and address of the vendor, packer, or processor.

Misbranding with respect to any of these requirements is indicated by boldface type, and the wholesaler's name is in boldface.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test	Mass. Standard %
Associated Seed Growers, Inc., Milford, Conn.						
1025	Beet	Burlingame & Darby's Co., No. Adams Eclipse	87	11/1942	82 June	65
555F	Corn	Canton Supply Co., Canton Golden Bantam	90	2/1943	90 May	75
1061	Beet	Checkerboard Feed Store, Amherst Crosby's Egyptian	—	—	80 June	65
1059	Cabbage	Danish Ballhead or Holsteiner	—	—	78 July	75
498	Carrot	Danvers Half Long	—	—	66 June	55
1060	Lettuce	Iceberg	—	—	97 June	80
1058	Squash	Blue Hubbard	—	—	68a June	75
527F	Beet	Checkerboard Feed Store, Franklin Early Wonder	72	12/1942	80 June	65
528	Turnip	Purple Top White Globe	80	8/1942	86 June	80
316F	Beans	Checkerboard Feed Store, Greenfield Burpee's Bush Lima	85	12/1942	87 May	70
317F	Beet	Detroit Dark Red	77	10/1942	81 May	65
321F	Corn	Golden Sunshine	89	1/1943	94 May	75
1026	Beans	Checkerboard Feed Store, No. Adams Bush Lima, Burpee's No. 67797	—	—	99 July	70
1029	Carrot	Imperator	74	11/1942	74 June	55
1028	Cauliflower	Early Snowball	90	8/1942	97 July	79
1027	Peas	Gradus, No. 64257	85	12/1942	90 June	80
1031	Pumpkin	Conn. Field	—	—	1943 94	June 75
1086	Lettuce	Checkerboard Feed Store, Palmer Iceberg	—	—	95 June	80
1087	Turnip	Purple Top White Globe	—	—	88 July	80
965	Beans	Checkerboard Feed Store, Pittsfield Dwarf Horticultural	—	—	86 July	80
964	Pumpkin	Conn. Field	—	—	97 June	75
966	Rutabaga	American Purple Top	—	—	83 July	75
1081	Carrot	Faulkner Hardware Co., Palmer Improved Long Orange	74	11/1942	68 June	55
1082	Squash	Improved Hubbard	88	11/1942	95 June	75
449F	Carrot	Granite City Hardware Co., Quincy Improved Long Orange	—	—	73 June	55
1226	Squash	Hamilton Hardware Co., Clinton Early Prolific Straightneck	—	—	93 July	75
1005	Beet	Frank Howard, Inc., Pittsfield Asgrow Wonder	72	12/1942	81 June	65
1004	Lettuce	Prizehead	—	—	10/1942 97	June 80
1003	Turnip	Yellow Globe	88	11/1942	87 June	80
368F	Beans	Methé's Checkerboard Store, Spfld. Burpee's Stringless Green Pod	85	10/1942	80 May	80
367	Peas	Laxtonian	85	10/1942	94 July	80
879	Beet	Methé's Checkerboard Store, Westfield Detroit Dark Red	85	10/1942	68b June	65
877	Lettuce	Bjg Boston	—	—	99 June	80
876	Onion	Yellow Globe Danvers	90	1/1943	80b June	70

a Below Standard

b Above Standard but below given germination

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination %	Month of Test	Mass. Standard %
Associated Seed Growers, Inc.—Con.							
1120	Beans	Wardsworth Howland & Co., Inc., Boston Asgrow Black Valentine.....	—	—	75a	July	80
		Leon Zocchi Co., Milford					
263F	Beet	Crosby's Egyptian.....	72	11 1942	83	June	65
262	Spinach	Bloomsdale Reselected.....	85	10 1942	87	May	60
Belmont Hardware Co., Springfield, Mass.							
626	Lettuce	Simpson Early Curled.....	69	2 1943	69	May	80
627	Turnip	Yellow Globe.....	56	2 1943	65	June	80
Joseph Breck & Sons, Boston, Mass.							
501	Lettuce	Adams Hardware, Inc., Dorchester Green Leaved Big Boston.....	—	—	95	June	80
312F	Corn	S. Allen's Sons, Greenfield Golden Bantam.....	—	—	87	May	75
91F	Beans	Joseph Breck & Sons, Boston Improved Rust Proof Golden Wax, No. 13.....	—	—	93-3c	May	80
87F	Beet	Arlington Strain-Crosby's Egyptian, No. 41.....	—	—	76	May	65
88F	Carrot	Breck's Market Garden-Danvers Half Long, No. B 198.....	—	—	65	May	55
90F	Corn	Tendergold, No. 13.....	—	—	90	May	75
94	Cucumber	Straight 8, No. C 196.....	—	—	93	May	80
92	Peas	Gradus or Prosperity, No. 12.....	—	—	85	June	80
95	Pepper	Harris Earliest, No. C 156.....	—	—	69	May	55
89	Spinach	Nobel Giant, No. C 460.....	—	—	83	May	60
96	Squash	Blue Hubbard, No. 16.....	—	—	76	May	75
93	Tomato	Marglobe, No. C 158.....	—	—	92	May	75
443	Peas	Campbell Hardware Co., Newton Improved Telephone.....	—	—	93	June	80
482	Beet	Centre Hardware Co., Roslindale Crosby's Egyptian.....	—	—	87	June	65
484	Radish	Scarlet Globe.....	—	—	89	May	75
483	Spinach	Blomstedt Long Standing Savoy.....	—	—	95	May	60
485	Turnip	Purple Top White Globe.....	—	—	97	June	80
426F	Beet	The College Hardware Co., Wellesey Beats All.....	—	—	80	May	65
425F	Carrot	Chantenay.....	—	—	68	June	55
424F	Beet	P. B. Corkum, Inc., Wellesey Crosby's Egyptian.....	—	—	73	June	65
441F	Carrot	Long Orange.....	—	—	71	June	55
442F	Carrot	Scarlet Horn.....	—	—	65	June	55
422	Cucumber	Improved Long Green.....	—	—	58a	May	80
423	Radish	French Breakfast.....	—	—	84	May	75
667F	Beet	Farmers Cooperative Trading Association, Hubbardston Dewing's Early Blood.....	—	—	65	June	65
668	Turnip	Skirving's Purple Top.....	—	—	97	June	80
1251	Endive	Fletcher Hardware Co., Inc., Watertown Green Curled.....	—	—	83	July	70
514F	Carrot	Franklin Hardware & Plumbing Supply Co., Franklin Hutchinson.....	—	—	63	June	55
515	Lettuce	N. Y. Imperial 847.....	—	—	94	May	80
516	Onion	Yellow Globe Danvers.....	—	—	91	May	70
1227	Corn	Hamilton Hardware Co., Clinton Carmelcross Hybrid, No. 5760.....	—	—	53a	July	75
490F	Beans	E. J. Keelan, Dedham Black Wax.....	—	—	93	May	80

a Below Standard
c 3% Hard Seed

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination % of Test	Date of Test	Found Germination—Month of Test	Mass. Standard %
Joseph Breck & Sons.—Con.						
733	Lettuce	Leavitt's Sport Shop, Haverhill Tennisball.....	—	—	84 June	80
499F	Beans	J. MacFarland & Son, Wollaston Lowe's Champion Cranberry.....	—	—	96 May	80
486	Peas	New Style Hardware Co., Roslindale World's Record.....	—	—	82 July	80
Norwood Hardware & Supply Co.,						
538	Cucumber	Norwood Davis Perfect.....	—	—	80 May	80
537	Squash	Golden Summer Crookneck.....	—	—	99 May	75
Frank W. Richardson, Waltham						
494	Spinach	Bloomsdale or Savoy Leaved.....	—	—	83 May	60
492	Turnip	Red Top Strap Leaf.....	—	—	88 June	80
Sanborn & Damon Co., Quincy						
376F	Carrot	Danvers Half Long.....	—	—	70 June	55
378	Peas	Hundredfold.....	—	—	95 July	80
377	Radish	Scarlet Globe.....	—	—	94 May	75
380	Swiss Chard	Lucullus.....	—	—	87 June	65
Shurtleff Hardware Co., Middleboro						
1175	Peas	World's Record.....	—	—	87 July	80
Skelton Hardware Co., Inc., Newton Centre						
440	Cauliflower	Early Dwarf Erfurt.....	—	—	81 May	75
Town Paint & Supply Co., West Newton						
558	Peas	Sutton's Excelsior.....	—	—	96 June	80
Winer's Hardware Co., Whitman						
1134a	Beans	Bountiful, Green Pod, No. 5028.....	—	—	93 July	80
1134b	Beans	Kentucky Wonder-Old Homestead Green Pod, No. 5211.....	—	—	88 July	80
1134c	Beet	Beats All, No. 5279.....	—	—	75 August	65
Italian Breck's Selected Stock, No. 5319.....						
1134e	Carrot	Chantenay, No. 5556.....	—	—	97 July	75
1134g	Lettuce	Big Boston Unrivalled, No. 6083.....	—	—	86 July	55
1134h	Radish	Scarlet Globe, No. 6764.....	—	—	94 July	80
1134f	Swiss Chard	Dark Green Curled, No. 6885.....	—	—	94 July	75
1134i	Tomato	Dark Green Curled, No. 6885.....	—	—	97 July	65
1134i	Tomato	Bonny Best, N9. 7086.....	—	—	85 July	75
W. Atlee Burpee Co., Philadelphia, Pa						
S. Allen's Sons, Greenfield						
310F	Beans	Pencil Pod Black Wax.....	—	—	87 May	80
307F	Beet	Crosby's Egyptian.....	—	—	65 May	65
308F	Carrot	Danvers Half Long.....	—	—	72 May	55
311	Peas	Laxton's Progress.....	—	—	83 July	80
309	Spinach	Bloomsdale.....	—	—	45a May	60
Brad's Hardware Co., Maynard						
749	Peas	Telephone.....	—	—	87 June	80
Brownell Hardware Co., Attleboro						
392F	Beet	Detroit Dark Red.....	85	11 1942	79 May	65
Approx.						
394F	Corn	Marcross 13.6.....	85	11 1942	95 May	75
393	Onion	White Portugal.....	75	11 1942	88 May	70
395	Peas	Number 40.....	—	—	92 June	80
Bryant's Hardware Co., Haverhill						
730F	Carrot	Hutchinson.....	—	—	4a June	55
J. H. Chandler & Son, Inc., Newton Centre						
438	Lettuce	N. Y. No. 12.....	—	—	86 May	80
Harding St. Grain Store, Worcester						
1266	Beans	Dwarf Horticultural.....	—	1941	82 July	80
614F	Beet	Dewing's Early Blood Turnip.....	—	—	61a May	65

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month % of Test	Mass. Standard %	
W. Atlee Burpee Co.—Con.							
Harding St. Grain Store—Con.							
1254	Carrot	Danvers Half Long	—	—	69	July	55
1267	Rutabaga	Purple Top Yellow, No. 5-283	—	—	98	July	75
Northboro Hardware Co., Northboro							
1277	Turnip	Purple Top White Globe	85	1 1943	94	July	80
Raymond's Inc., Boston							
724	Beans	Stringless Black Valentine	—	—	88	July	80
719F	Beets	Early Wonder	—	—	78	June	65
721	Lettuce	Black Seeded Simpson	—	—	97	June	80
722	Radish	Scarlet Globe	—	—	71a	June	75
720	Spinach	Bloomdale Long Standing	—	—	90	May	60
723	Turnip	Purple Top White Globe	—	—	98	June	80
Harry Seder, Webster							
1111	Beans	Rustproof Golden Wax	—	—	89	July	80
Schofield Hardware Co., No. Attleboro							
385F	Beet	Detroit Dark Red	70	1 1943	73	May	65
389	Cabbage	Perfection Drumhead Savoy	80	1 1943	79	May	75
387	Cucumber	Improved White Spine	80	1 1943	95	May	80
390	Squash	Giant Golden Summer	—	—	69a	May	75
The Service Co., Foxboro							
557-a	Beans	Bush-Surecrop Stringless Wax, No.49	—	—	85	July	80
557-b	Beans	Burpee's Stringless Green Pod, No.10	—	—	94	July	80
557-c	Beans	Bush Lima Burpee's Improved, No.63	—	—	79	July	70
557-d	Beet	Burpee's Black-Red Ball	—	—	74	July	65
557-e	Carrot	Goldinhart	—	—	80	July	55
557-g	Corn	Burpee's Golden Bantam, No. 301	—	—	93	July	75
557-h	Cucumber	Burpee's Fordhook White Spine	—	—	84	July	80
557-i	Lettuce	Big Boston	—	—	90	July	80
557-j	Onion	Sweet Spanish	—	—	81	July	70
557-k	Parsley	Extra Curled Dwarf or Emerald	—	—	85	July	60
557-l	Radish	White Icicle	—	—	82	July	75
557-m	Radish	Burpee's Rapid Red	—	—	91	July	75
557-n	Squash	Early White Bush	—	—	81	July	75
557-f	Swiss Chard	Lucullus	—	—	75	July	65
557-o	Turnip	Purple Top White Globe	—	—	97	July	80
Victory Auto Supplies, Fitchburg							
669	Broccoli	Calabrese	80	12 1942	75	June	75
China World Trading Co., Medford, Mass.							
United Cooperative Society, Fitchburg							
671	Mung Bean	New Green	—	—	88	July	None
Comstock, Ferre & Co., Wethersfield, Conn							
Bryan Hardware Co., Westfield							
884	Endive	Batavian Broad Leaf	—	—	74	June	70
683	Kohlrabi	Early Purple Vienna	—	—	85	July	75
882	Swiss Chard	Giant Lucullus	—	—	79	June	65
A. J. Cataldo & Sons, Franklin							
523F	Beet	Edmand's Early Turnip	—	—	67	May	65
524F	Carrot	Danvers Half Long	—	—	84	June	55
526	Radish	Early Scarlet Turnip	—	—	95	May	75
525	Spinach	Savoy Long Standing	—	—	91	May	60
Franklin Hardware Co., No. Attleboro							
381F	Beet	Early Wonder	80	12 1942	87	May	65
383	Soy Beans	Aoda—Edible	78	2 1943	78	August	None
Foster Farrar Co., Northampton							
345	Asparagus	Mary Washington	—	—	82-13c	May	70
343F	Beans	Sure Crop Stringless Flat Pod Black Wax	—	—	92	May	80
341F	Beet	Early Wonder	—	—	83	May	65
342F	Carrot	Hutchinson	—	—	69	May	55
344F	Corn	Golden Cross Bantam	—	—	86	May	75
346	Onion	Ebenezer	95	11 1942	90	May	70
347	Squash	Blue Hubbard (Special Strain)	—	—	98	May	75

a Below Standard
c 13% Hard Seed

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination %	Given Date of Test	Found Germination %	Month of Test	Mass. Standard %
Comstock, Ferre & Co.—Con.							
1245	Egg Plant	G. W. Gardiner & Son, Fall River	78	12/1942	83	July	60
1244	Tomato	John Baer	92	12/1942	91	July	75
F. A. Gould, Milford							
268	Cabbage	Copenhagen Market	83	1/1943	77	May	75
267F	Carrot	Hutchinson	69	12/1942	83	May	55
269	Celery	Giant Pascal	70	1/1943	63	May	55
270	Onion	Southport Red Globe	89	1/1943	86	May	70
Frank P. Mills, Campello							
160F	Beet	Detroit Dark Red	—	—	78	May	65
157F	Carrot	Hutchinson	80	12/1942	75	May	55
New England Toro Co., Newton							
208F	Beans	Bountiful	—	—	90	May	80
211F	Beets	Crosby's Egyptian	69	3/1943	55d	June	65
212F	Carrot	Chantenay, Half Long Red Cored	79	3/1943	91	May	55
210F	Corn	Whipple's Early	95	11/1942	82b	May	75
214	Cucumber	Straight 8	88	3/1943	93	May	80
213	Lettuce	Black Seeded Tennisball	—	—	95	May	80
209	Peas	Laxton's Superb	92	1/1943	88	June	80
Palmer Hardware Co., Needham							
412	Parsnip	Hollow Crown	68	1/1943	66	June	60
The O. B. Parks Co., Westfield							
863	Beans	Improved Golden Wax	75	12/1942	31d	August	80
C. S. Sawyer & Co., Fall River							
1240	Turnip	*Macomber (Rutabaga)	91	12/1942	85	July	80
Sawyer Hardware Co., Canton							
554	Spinach	Early Giant Thick Leaf	65	12/1942	77	May	60
Joseph Sordillo & Sons, Boston							
44F	Beans	Dwarf Horticultural	—	—	86-3c	May	80
46F	Corn	Golden Bantam	—	—	88	May	75
50	Peas	Sutton's Excelsior	—	—	91	June	80
Arthur R. Cone, Buffalo, N. Y.							
Central Hardware Co., Fitchburg							
579	Cucumber	White Spine Improved	90	1943	86	June	80
Methe's Checkerboard Feed Store, Westfield							
875	Turnip	Purple Top White Globe	—	—	93	July	80
Worcester Grain & Coal Co., Worcester							
770F	Beans	Golden Wax Top Notch, Lot No.16-30	90	1943	87	May	80
768F	Beet	Early Wonder, No. 135-143	76	1/1943	62d	June	65
767F	Carrot	Danvers Half Long	—	3/1943	69	June	55
771F	Corn	Improved Golden Bantam, No.50-266	90	2/1943	95	May	75
769	Cucumber	White Spine Improved, No. 150-43	90	1943	89	June	80
Crosman Seed Corp., East Rochester, N. Y.							
S. S. Kresge Co., Dorchester							
510	Cucumber	Improved Long Green	80	1943	89	May	80
506	Parsley	Extra Double Curled	60	1943	73	June	60
508	Parsnip	Improved Hollow Crown	60	1943	73	June	60
507	Radish	Early Long Scarlet	80	1943	86	May	75
509	Rutabaga	American Purple Top	75	1/1943	99	June	75
S. S. Kresge Co., New Bedford							
18F	Bean	Golden Wax	80	1943	73-9ae	May	80
17F	Beet	Early Blood Turnip	70	1943	77	June	65
21	Cabbage	Early Jersey Wakefield	75	1943	82	May	75
19F	Carrot	Chantenay—Half Long	60	1943	61	May	55
20F	Corn	Golden Bantam	80	1/1943	86	May	75
24	Lettuce	Black Seeded Simpson	85	1943	94	May	80

a Below Standard

b Above Standard but below given germination

c 3% Hard Seed

d Below Standard and below given germination

e 9% Hard Seed

* A Rutabaga incorrectly labeled Turnip

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—% of Test	Month of Test	Mass. Standard %
Crossman Seed Corp.—Con.							
S. S. Kresge Co., New Bedford—Con.							
22	Onion	Red Wethersfield	70	1943	85	May	70
257	Spinach	Giant Nobel	60	1943	85	May	60
23	Tomato	Earliana	80	1943	99	May	75
S. S. Kresge Co., Springfield							
842-b	Beet	Detroit Dark Red	65	—	77	June	65
842-c	Carrot	Chantenay	60	—	57	June	55
842-a	Lettuce	Grand Rapids	80	—	81	June	80
842-i	Parsley	Moss Double Curled	60	—	66	June	60
842-e	Radish	Round Scarlet White Tipped	80	—	94	June	75
842-d	Spinach	Bloodsdales	60	—	72	June	60
842-g	Turnip	Purple Top White Globe	80	—	82	July	80
Montgomery Ward Co., Greenfield							
328	Broccoli	Italian Green Calabrese	80	—	88	May	75
327F	Carrot	Danvers Half Long	60	—	76	May	55
329	Celery	Paris Golden Self Blanching	60	—	66	May	55
Tested for							
330	Swiss Chard	Fordhook Giant	65	1943	81	June	65
Tested for							
331	Tomato	Earliana	80	1943	96	May	75
Henry A. Dreer, Inc., Philadelphia Pa.							
First National Stores, Inc., Danvers							
573-a	Beans	Plentiful, No. 29	92	12 1942	89	July	80
573-b	Beet	Early Red, No. 148	86	1 1943	80	July	65
573-c	Beet	Eclipse, No. 155	65	1 1943	69	July	65
or better							
573-d	Carrot	Chantenay, No. 231	85	2 1943	87	July	55
573-f	Corn	Bantam Evergreen, No. 311	86	1 1943	84	July	75
573-e	Cucumber	Straight 8, No. 391	73	12 1942	97	July	80
573-g	Lettuce	Unrivaled, No. 446	73	12 1942	95	July	80
573-h	Lettuce	Iceberg, No. 464	80	1 1943	75a	July	80
573-i	Onion	Southport Yellow Globe, No. 586	90	12 1942	84	July	70
573-j	Parsley	Dreer's Summer Green, No. 604	80	12 1942	78	July	60
573-k	Pea	Alaska, No. 618	80	1 1943	93	July	80
or better							
573-l	Radish	Scarlet Globe, No. 813	90	12 1942	97	July	75
573-m	Spinach	Re-selected Savoy, No. 851	86	12 1942	63b	July	60
573-n	Swiss Chard	Broad Rib Green, No. 169	75	2 1943	87	July	65
573-o	Tomato	Improved Stone, No. 943	80	12 1942	86	July	75
Eastern States Farmers' Exchange, Springfield, Mass.							
Eastern States Farmers' Exch., Montello							
141F	Beans	Fordhook, No. 2212	90	—	89	May	80
139F	Beans	Sure Crop Wax, No. 2212	90	—	90	May	80
142	Cabbage	Mammoth Red Rock, No. 413	85	12 1942	84	May	75
138F	Carrot	Imperator, No. 618	75	12 1942	79	May	55
140F	Corn	Marcross 13.6, No. 14522	90	12 1942	95	May	75
144	Cucumber	A & C Special, No. 8113	85	2 1943	85	May	80
148	Lettuce	Imperial 847, No. 613	95	3 1943	96	May	80
143	Onion	Yellow Globe Danvers, No. 20813	80	2 1943	84	May	70
145	Peas	Thomas Laxton, No. 311	85	12 1942	84	June	80
146	Squash	Early Prolific Straightneck, No. 613	90	12 1942	98	May	75
147	Swiss Chard	Lucullus, No. 713	80	12 1942	85	June	65
Eastern States Farmers' Exch., Waltham							
221	Beet	Crosby (Early Wonder), No. 313	80	12 1942	88	June	65
224	Parsnip	Improved Hollow Crown, No. 613	70	1 1943	67	May	60
223	Rutabaga	L. I. Neckless Purple Top, No. 2422	90	12 1942	99	June	75
222F	Spinach	Dark Green Bloodsdales, No. 11012	95	12 1942	94	May	60
225	Turnip	Purple Top White Globe, No. 11022	95	12 1942	98	May	80
Templeton Farmers Cooperative Association, Inc., Templeton							
642F	Beet	Detroit (Late Market Globe), No. 4412	90	12 1942	80b	June	65
644F	Carrot	Bunching, No. 618	70	12 1942	68	June	55
643	Peas	Laxton's Progress, No. 313	90	12 1942	96	June	80
Thomas W. Emerson Co., Beverly, Mass.							
Bellingham Hardware Co., Weymouth							
448F	Corn	Golden Bantam	—	—	84	May	75
445	Cucumber	White Spine	—	—	96	May	80
446	Radish	French Breakfast	—	—	90	May	75

a Below Standard

b Above Standard but below given Germination

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test	Mass. Standard %	
Thomas W. Emerson Co.—Con.							
Billingham Hardware Co.—Con.							
447	Squash	Great Straight Neck.....	—	—	85	May	75
Drive-In-Fruitland, Boston							
1151	Chicory	French Endive.....	—	—	48a	June	65
1152	Kale	Dwarf Green Curled.....	—	—	56a	July	75
1150	Rutabaga	American Purple Top.....	—	—	99	July	75
J. B. Hunter Co., Boston							
837	Beet	Crosby's Egyptian.....	—	—	73	June	65
839	Egg Plant	New York.....	—	—	84	June	60
840	Kale	Dwarf Green Curled.....	—	—	76	June	75
838	Lettuce	N. Y. No. 12.....	—	—	49a	June	80
841	Turnip	White Egg.....	—	—	96	June	80
Jordan Marsh Co., Boston							
248F	Beans	Bush Lima.....	—	—	92	May	70
242	Brussels Sprouts	Improved Long Island.....	—	—	22a	May	70
243	Cabbage	Improved Savoy.....	—	—	91	May	75
244	Lettuce	Big Boston.....	—	—	84	May	80
245	Onion	Southport Red Globe.....	—	—	84	May	70
246	Pepper	Harris Giant.....	—	—	45a	April	55
247	Tomato	John Baer.....	—	—	94	May	75
F. B. Keene, Amesbury							
77F	Beans	French Dwarf Horticultural.....	—	—	87	May	80
73F	Beet	Crosby's Egyptian.....	—	—	79	May	65
74F	Carrot	Danvers Half Long.....	—	—	78	May	55
76F	Corn	Golden Bantam.....	—	—	76	May	75
75	Spinach	Round Leaved.....	—	—	67	May	60
Perron & Company, Southbridge							
1107	Beans	Golden Wax.....	—	—	80	July	80
South Shore Hardware Co., Quincy							
453F	Beet	Early Wonder.....	—	—	62a	July	65
456F	Carrot	Improved Long Orange.....	—	—	76	June	55
455F	Corn	Golden Sunrise.....	—	—	75	May	75
454	Endive	Broad Leaf.....	—	—	73	June	70
G. C. Winter Co., Southbridge.							
1099	Peas	World's Record.....	—	—	90	June	80
1100	Peas	Champion of England.....	—	—	93	June	80
Yankee Maid Products, Inc., Boston							
1046	Beet	Extra Early Dark Egyptian.....	—	—	44a	July	65
1045	Celery	Boston Market.....	—	—	42a	July	55
1044	Leek	Large American Flag.....	—	—	22a	June	60
1047	Onion	Southport Red Globe.....	—	—	84	June	70
Empire Seed Co., Fredonia, N. Y.							
S. Maggipinto, Springfield							
632	Broccoli	Italian Green Sprouts.....	40	12/1942	42	May	75
630F	Carrot	Chantenay.....	—	—	57	June	55
631	Lettuce	Black Seeded Simpson.....	—	—	84	May	80
Woodlawn Supply Co., So. Hadley							
351F	Beet	Early Blood Turnip.....	—	—	88	June	65
352F	Carrot	Danvers Half Long.....	—	—	72	May	55
354	Celery	Golden Self Blanching.....	—	—	60	May	55
355	Parsley	Champion.....	—	—	63	June	60
356	Rutabaga	American Purple Top.....	—	—	89	June	75
353	Spinach	Large Bloomsdale Savoy Leaved.....	—	—	61	May	60
Ferry-Morse Seed Co., Detroit, Mich.							
Carlisle Hardware Co., Springfield							
361F	Beet	Early Wonder.....	84	2/1943	77	June	65
364F	Corn	Whipple's Yellow Corn.....	—	—	85	May	75
362	Cucumber	White Spine.....	—	—	86	May	80
365	Dandelion	Improved Thick Leaved.....	—	—	77	June	45
363	Radish	Early Scarlet Globe.....	—	—	76	May	75

Results of Inspection and Germination of Vegetable Seeds
 Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test	Mass. Standard %	
Ferry-Morse Seed Co.—Con.							
Concord Hardware & Plumbing Supply Co., Concord							
682F	Beet	Crosby's Egyptian.....	—	—	82	June	65
681F	Carrot	Danvers Half Long.....	—	—	61	June	55
Copeland Hardware Co., Taunton							
194F	Beans	Plentiful.....	—	—	94	May	80
193F	Carrot	Long Orange.....	—	—	77	May	55
195	Peas	Telephone.....	—	—	90	June	80
W. T. Grant Co., Boston							
112F	Beet	Detroit Dark Red.....	—	—	90	May	65
113F	Carrot	Red Cored Chantenay.....	—	—	74	May	55
115	Spinach	Savoy Leaved or Bloomsdale.....	—	—	82	May	60
Jordan Marsh Co., Boston							
239F	Carrot	Long Orange.....	—	—	84	May	55
240	Cauliflower	Early Snowball.....	—	—	96	May	75
241	Onion	Southport Yellow Globe.....	—	—	76	May	70
M. N. Landau Stores, Inc., Westfield (*)							
886	Leek	(*).....	—	—	81	June	60
Skelton Hardware Co., Newton Centre							
439F	Beans	Ferry's Golden Wax, No. 21034....	—	—	89	May	80
Union Florist, Boston							
176F	Beans	Golden Wax.....	—	—	82	May	80
177F	Corn	Golden Bantam.....	—	—	81	May	75
178	Peas	Nott's Excelsior.....	—	—	93	June	80
Ben Franklin Stores, Chicago, Ill.							
Ben Franklin Stores, Lee							
902	Beet	Crosby's Egyptian.....	70	1 1942	78	June	65
903	Carrot	Chantenay.....	60	1 1943	69	June	55
911	Lettuce	Big Boston.....	80	1 1943	87	June	80
904	Radish	Scarlet Globe.....	80	1 1943	77	June	75
Fraser's Wellesley, Mass.							
J. H. Chandler & Son, Newton Centre							
433	Cucumber	Improved White Spine.....	Approx. 95	1 1943	93	May	80
Fraser's Wellesley							
427F	Beans	Bountiful.....	—	—	96	May	80
429F	Beet	Detroit Dark Red.....	Approx. 80	1 1943	82	May	65
430	Cabbage	Golden Acre.....	Approx. 85	1 1943	84	May	75
428F	Corn	Golden Cross Bantam.....	—	—	91	May	75
431	Parsley	Moss Curled.....	Approx. 80	1 1943	82	June	60
432	Radish	Special Early Scarlet Globe.....	90	1/1943	98	May	75
A. L. Turner, North Quincy							
500	Parsnip	All American Hollow Crown.....	Approx. 75	1 1943	67	June	60
R. H. White Co., Boston							
109	Broccoli	Special Italian.....	Approx. 65	1 1943	94	May	75
107F	Carrot	Danvers Half Long.....	Approx. 70	1 1943	75	May	55
110	Lettuce	Black Seeded Tennisball.....	Approx. 90	1 1943	96	May	80
108	Spinach	Reselected Bloomsdale Savoy.....	Approx. 85	1 1943	84	May	60
Fredonia Seed Co., Fredonia, N. Y.							
Bellingham Hardware Co., Weymouth							
444	[[Cucumber	Early White Spine.....	—	—	93	May	80
Public Market, West Stockbridge							
995	Beans	Golden Wax.....	90	1 1943	91	July	80
994	Corn	Golden Bantam.....	85	1 1943	85	July	75
Town Paint & Supply Co., West Newton							
594F	Carrot	Oxheart.....	—	—	56	June	55

*Variety required but not given

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month % of Test	Mass. Standard %	
Fredonia Seed Co.—Con.							
Town Paint & Supply Co.—Con.							
595	Parsley	Plain Broad Leaved.....	—	—	65	June	60
593	Radish	Ea. Scarlet Globe.....	—	—	96	May	75
Weir Cash Market, Taunton							
199F	Beet	Early Blood Turnip.....	—	—	72	June	65
198F	Carrot	Chantenay.....	—	—	68	May	55
200	Turnip	Purple Top Flat Strap Leaf.....	—	—	75a	May	80
Thomas J. Grez Co., Boston, Mass							
54F	Beans	Hendersons' Bush Lima.....	—	—	83-6c	May	70
63F	Beet	Early Wonder.....	—	—	65	May	65
57	Cabbage	Golden Ace.....	—	—	75	May	75
52F	Carrot	Danvers Half Long.....	—	—	73	May	55
55F	Corn	Golden Early Market.....	—	—	98	May	75
60	Cucumber	Improved Long Green.....	—	—	83	May	80
61	Lettuce	Big Boston.....	—	—	97	May	80
56	Peas	Blue Bantam.....	—	—	92	June	80
58	Pepper	Harris Early Giant.....	—	—	66	May	55
53	Spinach	Reselected Savoy Bloomsdale.....	—	—	61	May	60
62	Squash	Giant Summer Crookneck.....	—	—	94	May	75
59	Tomato	John Baer.....	—	—	89	May	80
Joseph Harris Co., Inc., Rochester, N. Y							
Joseph Harris Co., Inc., Cambridge							
254F	Beans	Plentiful, No. 2321.....	99	—	91	May	80
249F	Beet	Detroit Dark Red.....	80	1943	68b	June	65
251	Cabbage	Early Jersey Wakefield.....	88	—	85	May	75
250F	Carrot	Danvers Half Long.....	68	1943	62	May	55
255F	Corn	Golden Bantam, No. 1305.....	96	—	91	May	75
252	Lettuce	Grand Rapids.....	96	—	96	May	80
256	Spinach	Long Standing Bloomsdale, No. 523.....	92	—	87	May	60
253	Tomato	Dwarf Champion.....	88	—	94	May	80
Charles C. Hart Seed Co., Wethersfield, Conn.							
Allen Hardware Co., Needham							
409	Tomato	Hart's Improved New Stone.....	80	1 1943	86	May	75
Berkshire Hardware Co., Pittsfield							
975	Beans	Burpee's Bush Lima.....	—	—	89	July	70
976	Beet	Early Blood Turnip.....	90	1 1943	50d	June	65
977	Egg Plant	N. Y. Purple.....	60	1 1943	71	June	60
Carr Hardware Co., Pittsfield							
941	Soy Beans	Edible Soy (*).....	90	1 1943	63e	July	None
947	Turnip	Yellow Globe.....	—	—	95	June	80
R. E. Cobb Co., Weymouth							
476F	Beans	Dwarf French Horticultural.....	90	1 1943	93	May	80
478F	Carrot	Improved Long Orange.....	—	—	60	June	55
477	Cucumber	Early White Spine.....	—	—	69a	May	80
479	Radish	Early Scarlet Globe.....	—	—	91	May	75
480	Rutabaga	American Purple Top Yellow.....	—	—	98	May	75
Davis Hardware Co., Gardner							
664	Cucumber	Long Green.....	—	—	96	June	80
662	Lettuce	Big Boston.....	—	—	86	June	80
663	Spinach	Giant Thick Leaf.....	—	—	65	May	60
665	Swiss Chard	Dark Green.....	—	—	91	June	65
Federal Supply Co., Northampton							
301	Asparagus	Mary Washington.....	—	1 1943	78	May	70
295F	Beet	Detroit Dark Red.....	—	1 1943	81	June	55
296F	Carrot	Hutchinson.....	—	1943	62	May	55
299	Celery	Wonderful or Golden Plume.....	72	1 1943	49d	May	55
298	Cucumber	Black Diamond.....	90	1 1943	94	May	80
297	Spinach	Savoy.....	—	—	64	May	60
300	Squash	Blue Hubbard.....	90	1 1943	63d	May	75

a Below Standard

b Above Standard but below given germination

c 6% Hard Seed

d Below Standard and below given germination

e Below given germination

*Variety required but not given

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—% of Test	Month	Stand-ard %
Charles C. Hart Seed Co.—Con.							
Franklin Hardware Co., No. Attleboro							
384	Cabbage	Mammoth Red Rock.....	80	1 1943	56d	May	75
382	Onion	Large Red Wethersfield.....	70	1 1943	73	May	70
The Hardware Shop, Adams							
1011	Onion	Large Wethersfield.....	79	1 1943	90	June	70
1010	Rutabaga	Laurentian or Victory Neckless....	—	—	91	July	75
Jeffway-Hatch, Inc., Easthampton							
853	Rutabaga	White Swede.....	—	—	89	July	75
852	Turnip	White Egg.....	—	—	8a	July	80
E. J. Keelan, Dedham							
489F	Corn	Early Golden Bantam.....	90	1 1943	86	May	75
Lev Hardware Co., North Adams							
1021	Lettuce	Simpson's Early Curled.....	84	1 1943	87	June	80
1022	Radish	French Breakfast.....	84	1 1943	91	June	75
Mendelsohn's, Waltham							
219F	Beet	Crosby's Egyptian.....	82	1 1943	93	May	65
220	Lettuce	Big Boston.....	85	1 1943	93	May	80
Osborne Hardware Corp., Holyoke							
349	Parsley	Moss Curled.....	—	—	72	May	60
348	Peas	Nott's Excelsior.....	—	—	93	May	80
Pierce Hardware Co., Taunton							
205F	Beans	Asgrow Stringless Valentine.....	—	—	93	May	80
203F	Beet	Early Wonder.....	—	—	73	May	65
202F	Carrot	Danvers Half Long.....	—	—	72	May	55
206F	Corn	Hybrid Tendergold.....	—	—	58a	May	75
204	Peas	Little Marvel.....	—	—	88	July	80
207	Spinach	Bloomsdale—Blight Resistant.....	—	—	90	May	60
201	Tomato	Hart's Improved Stone.....	75	11 1942	52d	May	75
Frank W. Richardson, Waltham							
493F	Beans	Horticultural Bush.....	—	1 1943	84	May	80
James D. Splann Estate, So. Deerfield							
334F	Carrot	Hutchinson.....	80	1 1943	60b	July	55
336	Squash	Blue Hubbard.....	90	1 1943	98	May	75
F. H. Turner & Co., Great Barrington							
930	Beet	Early Blood.....	—	—	72	June	65
Wajte's Hardware Co., Worcester							
775F	Beans	Unrivaled Wax.....	—	—	82	May	80
1113	Parsnip	Hollow Crown.....	—	—	44a	June	60
Wells Hardware Co., Holyoke							
619	Peas	Sutton's Excelsior.....	90	1 1943	92	July	80
Budd D. Hawkins, Reading Vt.							
Elwood Adams Co., Worcester							
606	Celery	Giant Pascal.....	—	—	66	July	55
Irving B. Barrows & Co., Worcester							
793F	Beans	Golden Wax.....	—	—	62a	May	80
798F	Corn	Improved Golden Bantam.....	—	—	87	May	75
Herman F. Davis, Merrimac							
78F	Beet	Crosby's Egyptian.....	—	—	72	June	65
86	Broccoli	Italian Green Sprouting.....	—	—	54a	May	75
79	Cabbage	True Early Winningstadt.....	—	—	68a	May	75
80	Cabbage	Copenhagen Market.....	—	—	34a	May	75
81	Cauliflower	Early Snowball.....	—	—	38a	May	75
85	Celery	New White Plume.....	—	—	13a	April	55
84	Dandelion	Improved Thick Leaved.....	—	—	27a	April	45
82	Radish	New French Breakfast.....	—	—	95	April	75
83	Turnip	Orange Jelly or Yellow Globe.....	—	—	37a	May	80
Francis Bros. Inc., Reading							
26	Beans	Improved Golden Wax.....	—	—	86	May	80

a Below Standard

b Above Standard but below given germination

d Below Standard and below given germination

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test	Mass. Standard %
Budd D. Hawkins—Con.						
Francis Bros., Inc.—Con.						
27F	Beet	Detroit Dark Red.....	—	—	75 June	65
31	Cabbage	Premium Large Late Flat Dutch.....	—	—	77 May	75
28F	Carrots	Improved Long Orange.....	—	—	56 June	55
29F	Carrot	Red Cored Chantenay.....	—	—	62 May	55
30	Corn	Golden Bantam.....	—	—	77 April	75
35	Cucumber	Improved Long Green.....	—	—	85 April	80
32	Onion	Large Red Weathersfield.....	—	—	37a May	70
33	Parsnip	Improved Hollow Crown.....	—	—	57a April	60
34	Rutabaga	Improved Purple Top Yellow Hardy Swede.....	—	—	87 May	75
25	Spinach	American Savoy Leaved or Long Standing.....	—	—	76 April	60
36	Swiss Chard	(*).....	—	—	69 April	65
625	Lettuce	Franklin Hardware Corp., Springfield Extra Early Tennisball or Boston Market.....	—	—	1a May	80
640	Cabbage	Home Supply Co., Orange Mammoth Red Rock.....	—	—	28a June	75
1276	Cabbage	Northboro Hardware Co., Northboro Glory of Enkhuizen.....	—	—	1a July	75
64	Cabbage	A. P. Wilson, Newburyport Hollander or Danish Ball Head.....	—	—	69a May	75
66	Cucumber	Improved White Spine—Arlington Stock.....	—	—	90 April	80
68	Endive	Green Curled or Giant Fringed Oyster.....	—	—	85 April	70
67	Lettuce	Big Boston.....	—	—	63a May	80
65	Onion	Yellow Globe Danvers.....	—	—	45a April	70
69	Pepper	Improved Large Bell or Bull Nose.....	—	—	49a April	55
72	Salsify	Mammoth Sandwich Island.....	—	—	83 April	75
Herbst Bros., New York						
Monroe's Seed Market, Attleboro						
396F	Carrot	Chantenay, No. 3825.....	70	—	69 June	55
397F	Carrot	Danvers Half Long, No. 3823.....	69	—	80 June	55
Hygrade Seed Co., Fredonia, N. Y.						
Abraham Lincoln School, East Braintree						
163	Cabbage	Copenhagen Market.....	—	—	86 May	75
162F	Carrot	Red Cored Chantenay.....	—	—	73 May	65
164	Lettuce	Black Seeded Simpson.....	—	—	99 May	80
165	Parsley	Moss Curled.....	—	—	92 May	60
166	Pepper	California Wonder.....	—	—	93 May	55
167	Swiss Chard	Fordhook Giant.....	—	—	85 June	65
168	Tomato	Marglobe.....	—	—	97 May	75
Penniman School, Braintree						
173F	Beet	Crosby's Egyptian.....	—	—	66 June	65
174F	Beet	Detroit Dark Red.....	—	—	92 June	65
175	Radish	Early Scarlet Globe.....	—	—	95 May	75
Ernest W. Knight, Newburyport, Mass.						
A. J. Blyda, Hadley						
340F	Carrot	Hutchinson.....	—	—	72 May	55
339	Onions	Japanese.....	—	—	79 May	70
D. Landreth Seed Co., Bristol, Pa.						
Ellwood Adams Co., Worcester						
602F	Carrot	Long Orange or St. Vallery.....	70	—	75 June	55
605	Peas	Little Marvel.....	—	—	81 June	80
603	Spinach	Bloomsdale Long Standing.....	—	—	79 May	60
604	Squash	Summer Golden Crookneck.....	—	—	48a May	75
Baker Hardware Co., Wellesley						
414F	Beans	Unrivalled Wax.....	90	—	97 May	80
597-a	Beans	Landreth's Stringless Green Pod.....	—	—	97 July	80
597-b	Beans	Black Valentine Stringless.....	—	—	50a July	80
597-c	Beans	Fordhook Lima.....	—	—	96 July	70
597-d	Beans	Golden Wax.....	—	—	86 July	80
597-e	Beets	Landreth's Best.....	—	—	80 July	65

a Below Standard

* Variety required but not given

Results of Inspection and Germination of Vegetable Seeds Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination Date % of Test	Found Germination—Month % of Test	Mass. Standard %
D. Landreth Seed Co.—Con.					
Baker Hardware Co.—Con.					
417F	Carrot	Imperator.....	70	— 72	June 55
597-f	Carrot	Chantenay Half Long Scarlet or Model.....	—	— 59	July 55
597-g	Corn	Golden Colonel.....	—	— 94	July 75
419	Lettuce	Selected Big Boston.....	—	— 95	May 80
597-h	Lettuce	Early Curled Silesian.....	—	— 95	July 80
421	Onion	Ebenezer.....	—	— 89	May 70
597-i	Onion	Southport Yellow Globe.....	—	— 76	July 70
597-j	Parsley	Champion Moss Curled.....	—	— 70	July 60
597-k	Radish	Early Scarlet Globe.....	—	— 86	July 75
597-l	Radish	Icicle.....	—	— 96	July 75
420	Rutabaga	Landreth's Improved Yellow Fleshed Purple Top.....	—	— 75	June 75
418	Spinach	Bloomsdale Long Standing.....	75	— 85	May 60
597-m	Squash	Early White Bush.....	—	— 97	July 75
597-n	Tomato	Marglobe-Certified.....	—	— 96	July 75
597-o	Turnip	Large Early Red or Purple Top White Globe.....	—	— 99	July 80
Belmont Hardware Co., Springfield					
628F	Corn	Golden Evergreen.....	85	— 83	May 75
			or Better		
Community Grain Co., Worcester					
801	Swiss Chard	Lucullus.....	80	— 84	June 65
802	Turnip	White Egg.....	85	— 99	June 80
Dooley Hardware Co., Holyoke					
350F	Corn	Golden Bantam.....	85	— 84	May 75
			or Better		
Essex Hardware & Plumbing Supply Co., Lawrence					
699	Kale	Dwarf Curled Scotch.....	40	3/1943 40	June 75
Leavitt's Sport Shop, Haverhill					
732F	Beans	Lima — Henderson's.....	90	— 87-1c	May 70
			or Better		
Frank P. Mills, Campello					
158F	Beans	Landreth's Stringless Green Pod.....	—	— 97	May 80
161	Spinach	Bloomsdale Reselected.....	76	— 90	May 60
			or Better		
H. Newell & Co., Shelburne Falls					
1032	Parsnip	Sugar or Cup or Hollow Crown.....	70	— 90	June 60
Parker Farm & Supply Co., Danvers					
574F	Beans	Dwarf Horticultural.....	90	— 84	August 80
			or Better		
575F	Carrot	Danvers Half Long.....	70	— 69	June 55
			or Better		
576F	Corn	Whipple's Early Yellow.....	85	— 77b	May 75
			or Better		
577	Peas	Tall Telephone.....	85	— 91	June 80
Salem Hardware Co., Salem					
1199	Cabbage	Danish Ballhead.....	—	— 6a	July 75
1202	Carrot	Hutchinson.....	70	— 69	July 55
			or Better		
1200	Onion	Danvers Yellow Globe.....	75	— 87	July 70
			or Better		
1201	Turnip	Purple Top Globe.....	85	— 99	July 80
			or Better		
United Co-Operative Society, Maynard					
754F	Beans	Bountiful.....	90	— 93	May 80
			or Better		
755F	Carrot	Danvers Half Long.....	70	— 67	June 55
			or Better		
Frank L. Whitcomb, Amherst					
357F	Beet	Detroit Dark Red.....	80	— 78	May 65
			or Better		
358F	Carrot	Hutchinson.....	—	— 63	May 55
Little Tree Farms, Framingham Centre, Mass.					
582F	Carrot	Red Cored Chantenay.....	—	— 64	June 55
583	Cucumber	Arlington White Spine.....	—	— 90	May 80

a Below Standard

b Above Standard but below given germination

c 1% Hard Seed

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test	Mass. Standard %	
Little Tree Farms—Con.							
584	Lettuce	Big Boston Head.....	—	—	86	May	80
585	Tomato	Bonny Best.....	—	—	93	May	75
John D. Lyon, Inc., Belmont, Mass.							
J. H. Chandler & Son, Newton Centre							
437F	Beans	Pencil Pod Black Wax.....	—	—	91	May	80
436F	Beet	Crosby's Egyptian.....	—	—	75	June	65
435F	Carrot	Danvers Half Long.....	—	—	65	June	55
Methe's Checkerboard Feed Store, Springfield							
366F	Beet	Detroit Dark Red.....	—	—	65	July	65
Mandeville & King Co., Rochester, N. Y.							
Elwood Adams Co., Worcester							
610-a	Beet	Detroit Dark Red.....	—	—	77	July	65
610-b	Carrot	Chantenay.....	—	—	65	July	55
610-c	Cucumber	Long Green.....	—	—	98	July	80
610-d	Lettuce	Black Seeded Simpson.....	—	—	99	July	80
610-e	Onion	White Portugal.....	—	—	76	July	70
610-f	Parsley	Moss Curled.....	—	—	85	July	60
610-g	Radish	Scarlet Turnip White Tip.....	—	—	97	July	75
610-h	Tomato	Marglobe.....	—	—	92	July	75
610-i	Turnip	Purple Top White Globe.....	—	—	99	July	80
C. & D. Hardware & Plumbing Supply Co., Rockland							
475	Turnip	Purple Top White Globe.....	—	—	96	June	80
J. H. Chandler & Son, Newton Centre							
434	Tomato	Bonny Best.....	Approx. 85	—	84	May	75
Cleveland Hardware Co., Walpole							
536	Turnip	Purple Top White Globe.....	85	—	93	June	80
Federal Supply Co., Northampton							
302F	Beet	Detroit Dark Red.....	80	—	86	May	65
303	Cabbage	Danish Ballhead.....	80	—	86	May	75
304	Onion	Southport Yellow Globe.....	80	—	75	May	70
305	Parsley	Moss Curled.....	75	—	87	May	60
Schofield Hardware Co., No. Attleboro							
388	Cucumber	White Spine.....	85	—	97	May	80
A. P. Wilson, Newburyport							
70F	Carrot	Chantenay.....	75	—	74	May	55
71	Spinach	Bloomsdale Savoy Leaved.....	70	—	80	April	60
Michael-Leonard Seed Co., Chicago, Ill							
W. E. Aubuchon Co., Inc., Amherst							
1052	Beans	Pole Horticultural.....	—	—	91	July	80
1053	Cabbage	Danish Ballhead Imported.....	—	—	56a	July	75
1054	Cabbage	Premium Late Flat Dutch.....	—	—	42a	July	75
1055	Lettuce	Big Boston.....	—	—	98	June	80
1056	Lettuce	Iceberg.....	—	—	84	June	80
1057	Parsnip	Improved Hollow Crown.....	—	—	71	June	60
W. E. Aubuchon Co., Inc., Barre							
290F	Beans	Dwarf Horticultural.....	—	—	92	May	80
292F	Beet	Early Blood Turnip, No. 2132.....	78	12, 1943	67b	June	65
293	Cucumber	Early Improved White Spine.....	—	—	98	May	80
294	Lettuce	Iceberg.....	—	—	76a	May	80
291	Radish	White Tipped Scarlet Turnip.....	—	—	93	May	80
W. E. Aubuchon Co., Inc., Clinton							
1232	Beans	Pole Horticultural.....	—	—	93	July	80
1236	Lettuce	Iceberg.....	—	—	81	July	80
1231	Peas	Gradus.....	—	—	89	July	80
1237	Rutabaga	Improved American Purple Top.....	—	—	83	July	75
W. E. Aubuchon Co., Inc., Gardner							
652	Peas	Telephone.....	—	—	91	July	80

a Below Standard

b Above Standard but below given germination

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination Date % of Test	Found Germination—Month % of Test	Mass. Standard %
Michael-Leonard Seed Co.—Con.					
W. E. Aubuchon Co., Inc., Greenfield					
313	Cabbage	Premium Late Flat Dutch	—	1943 8a	May 75
315	Peas	Gradus	—	82	July 80
314	Radish	Early Scarlet Globe	—	93	May 75
W. E. Aubuchon Co., Inc., Holliston					
260	Beans	Pole Horticultural	—	32a	May 80
W. E. Aubuchon Co., Inc., Hudson					
1215	Beans	Pole Horticultural	—	90	July 80
1211	Cabbage	Danish Ballhead Imported	—	41a	July 75
1213	Lettuce	Big Boston	—	92	July 80
1214	Radish	Early Scarlet Globe	—	82	July 75
1216	Rutabaga	Improved American Purple Top	—	88	July 75
W. E. Aubuchon Co., Inc., Leominster					
284F	Beans	Pencil Pod Black Wax	—	74-6ac	May 80
285	Cabbage	Danish Ballhead	—	63a	May 75
283F	Carrots	Danvers	—	89	May 55
282	Lettuce	Big Boston	—	94	May 80
286	Swiss Chard	Silver	—	91	June 65
W. E. Aubuchon Co., Inc., Maynard					
753	Cucumber	Green Prolific or Boston Pickling	—	93	June 80
W. E. Aubuchon Co., Inc., Milford					
276F	Beet	Detroit Dark Red, No. 31	78	12 1942 71	June 65
279F	Carrot	Chantenay	—	90	May 55
281F	Corn	Golden Bantam	—	79	May 75
278	Endive	Broad Leaf Batavian	—	71	May 70
280	Onion	Yellow Globe Danvers	—	80	May 70
277	Parsnip	Hollow Crown	70	12 1942 79	May 60
W. E. Aubuchon Co., Inc., Orange					
639F	Beans	Sioux Stringless Wax	—	92	May 80
636F	Beet	Early Blood Turnip	—	84	June 65
638	Rutabaga	Improved American Purple Top	—	80	June 75
637	Squash	Summer Crookneck	—	99	June 75
634	Swiss Chard	Silver	—	70	June 65
W. E. Aubuchon Co., Inc., Shelburne Falls					
1035	Beet	Ealy Blood Turnip Improved	—	80	June 65
1033	Parsnip	Hollow Crown Improved	—	77	June 60
W. E. Aubuchon Co., Inc., Ware					
1073	Beans	Horticultural Cranberry or London Pole Horticultural	—	96	July 80
1072	Cabbage	Danish Ballhead Imported	—	81	July 75
W. E. Aubuchon Co., Inc., Worcester					
1271	Cabbage	Danish Ballhead Imported	—	45a	July 75
1275	Cabbage	Premium Late Flat Dutch	—	76	July 75
1273	Cucumber	Boston Pickling	—	97	July 80
1272	Lettuce	Big Boston	—	30a	July 80
1274	Parsley	Champion Moss Curled	—	60	July 60
C & D Hardware & Plumbing Supply Co., Rockland					
472	Cabbage	Early Jersey Wakefield	—	75	June 75
473	Lettuce	Big Boston	—	99	May 80
474	Tomato	Marglobe	—	97	May 75
Glennon Hardware Co., Dalton					
1008	Carrot	Danvers	—	85	June 55
1007	Lettuce	Early Curled Simpson	—	93	June 80
1009	Radish	White Icicle	—	96	June 80
Hamilton & Atwater, Inc., Hardware, Westfield					
891	Lettuce	Hanson	—	93	June 80
892	Muskmelon	Bender's Surprise	—	81	June 75
893	Tomato	Pritchard	—	86	June 75
Manchester-Forbes Co., Easthampton					
857	Muskmelon	Osage or Miller's Cream, No. 40431	90	12 1942 89	June 75

a Below Standard
c 6% Hard Seed

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given	Found	Mass. Stand-ard %		
			Germination %	Date of Test		Germina-tion %	Month of Test
Michael Leonard Seed Co.—Con.							
858	Turnip	Manchester Forbes Co.—Con. White Egg, No. 83412.....	90	12/1942	95	July	80
159F	Corn	Frank P. Mills, Campello Tendergold, No. 71594.....	80	12/1942	93	May	75
359F	Carrot	Mutual Plumb. & Heating Co., Amherst Hutchinson, No. 35.....	70	12/1942	89	May	55
360F	Corn	Alphagold, No. 35522.....	80	12/1942	92	May	75
F. X. Robichaud, Methuen							
703F	Beet	Early Wonder, No. 2731.....	75	12/1942	79	June	65
704	Broccoli	Green Italian Sprouting.....	—	—	95	June	75
701	Onion	Golden Globe, No. 57633.....	88	12/1942	94	June	70
702	Peas	Everbearing.....	—	—	88	July	80
Schofield Hardware Co., North Adams							
391F	Carrot	Danvers.....	70	12/1942	89	June	55
United Cooperative Farmers, Inc., Fitchburg							
677F	Beans	Burpee's Stringless Green Pod.....	85	12/1942	80	May	80
674F	Carrot	California Peerless.....	77	4/1943	88	June	55
675	Cucumber	Dark Green, No. 25531.....	83	12/1942	66d	June	80
678	Lettuce	Improved Hanson, No. 34361.....	80	12/1942	96	June	80
676	Peas	World's Record.....	85	12/1942	95	June	80
672	Rutabaga	Macomber, No. 85531.....	75	12/1942	75	July	75
673	Tomato	Bonny Best, No. 77232.....	84	12/1942	85	June	75
Waldron Hardware Co., Taunton							
184F	Carrot	Danvers, No. 15334.....	70	12/1942	94	May	55
190F	Corn	Stowell's Evergreen.....	80	12/1942	82	May	75
Winer Bros., Beverly							
578F	Beans	Top Notch Golden Wax, No. 4331... ..	85	12/1942	64-1cd	Aug.	80
580F	Beans	Burpee's Bush Lima.....	—	—	97	May	70
581	Spinach	King of Denmark, No. 67931.....	80	12/1942	86	May	60
579	Turnip	Purple Top White Globe.....	—	—	95	June	80
Northrup, King & Co., Minneapolis, Minn.							
Waltham Supply Co., Waltham							
491	Cucumber	Improved White Spine or Early Fortune.....	—	—	80	May	80
F. W. Woolworth Co., Boston							
1F	Beet	Detroit Dark Red.....	—	—	86	May	65
7F	Beet	Early Wonder or Crosby's Egyptian.....	—	—	83	May	65
6	Broccoli	Green Sprouting or Calabrese.....	—	—	93	May	75
9	Cabbage	Early Jersey Wakefield.....	—	—	84	May	75
15	Cabbage	Copenhagen Market.....	—	—	76	May	75
2F	Carrot	Improved Danvers Half Long.....	—	—	85	May	55
8F	Carrot	Chantenay.....	—	—	63	May	55
Below Stand.							
4	Cauliflower	Early Snowball.....	55	*/*	45d	May	75
5	Leek	American Flag.....	—	—	71	May	60
14	Lettuce	Paris White Cos or Romaine.....	—	—	98	May	80
10	Onion	Large Red Globe.....	—	—	67a	June	70
11	Pepper	Large Bell or Bull Nose.....	—	—	68	May	55
3	Spinach	Bloomsdale or Savoy Leaved.....	—	—	86	May	60
12	Tomato	Bonny Best or John Baer.....	—	—	91	May	75
F. W. Woolworth Co., New Bedford							
13	Brussels Sprouts	Improved Dwarf.....	—	—	64a	May	70
16	Onion	Yellow Globe Danvers.....	—	—	73	May	70
The Page Seed Co., Greene, N. Y.							
Arthur W. Baldwin & Co., West Stock-bridge							
993	Corn	Stowell's Evergreen, B 18-143.....	90	1/1943	87	July	75
The Bengtson Hardware Co., Gardner							
655F	Beans	Improved Golden Wax, A-19-5243... ..	90	2/1943	97	May	80

a Below Standard

c 1% Hard Seed

d Below Standard and below given germination

/ Date of test required but not given

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—% of Test	Month of Test	Mass. Standard %
The Page Seed Co.—Con.							
The Bengston Hardware Co.—Con.							
654F	Beets	Crosby's Egyptian, D-18643	65	1/1943	76	June	65
657F	Carrot	Danvers Half Long, F. H. 7543	75	1/1943	73	June	55
Clifford Coal Co., Inc., Lenox							
981	Beans	Burpee's Bush Lima	—	—	97	July	70
982	Beet	Egyptian Blood	60	1942	69	June	65
979	Peas	Telephone	—	—	93	June	80
Dresser-Hull Co., Lee							
914	Onion	Yellow Globe Danvers	—	—	74	June	70
913	Rutabaga	Yellow Swede	—	—	95	July	75
John M. Fitzgerald Co., Taunton							
197	Cabbage	Early Jersey Wakefield	75	1942	75	May	75
196	Lettuce	Grand Rapids	80	1942	87	May	80
Harry Seder, Webster							
1110	Carrot	Danvers Half Long, FI-7543	75	1/1943	70	June	55
The Snyder Store, Housatonic							
989	Cucumber	Long Green	85	1/1943	91	June	80
990	Swiss Chard	Large Ribbed White, D 10-8643	70	1/1943	79	June	65
988	Turnip	Yellow Globe X3-7442	90	12/1942	99	June	80
1017	Rutabaga	Stanley's Coal & Grain Co., Adams Yellow	—	—	32a	July	75
Stone Hardware Co., Brockton							
150	Cabbage	Jersey Wakefield	—	—	86	May	75
149F	Carrot	Long Orange, F 3.7543	75	1/1943	67	May	55
152F	Corn	Golden Bantam, B7.3943	90	2/1943	82b	July	75
151	Pepper	California Wonder	—	—	90	May	55
Perry Seed Co., Boston, Mass.							
121F	Beans	Fordhook Bush Lima, No. 741	—	—	55a	May	70
118F	Beet	Early Wonder	—	—	75	June	65
124	Cabbage	Marion Market, No. 1682	—	—	77	May	75
119F	Carrot	Chantenay Half Long, No. 2052	—	—	79	May	55
122F	Corn	Perry's Golden Sunshine, No. 2392	—	—	91	May	75
123	Cucumber	Arlington White Spine, No. 2863	—	—	94	May	80
126	Lettuce	Big Boston, No. 3625	—	—	95	May	80
125	Pepper	California Wonder, No. 5024	—	—	94	May	55
127	Radish	Perry's Scarlet Globe, No. 5826	—	—	89	May	75
120	Spinach	Long Standing Savoy, No. 6184	—	—	41a	May	60
130	Squash	Summer Straightneck, No. 6343	—	—	97	May	75
129	Tomato	Marglobe, No. 6926	—	—	97	May	75
128	Turnip	Purple Top White Globe, No. 7056	—	—	97	May	86
Ralston Purina Co., St. Louis, Mo.							
Checkerboard Feed Store, Franklin							
530	Pepper	World Beater	—	—	87	May	55
529	Radish	Early Scarlet Globe	—	—	88	May	75
Checkerboard Feed Store, Greenfield							
318F	Carrot	Chantenay	—	—	76	May	55
319	Lettuce	Grand Rapids	—	—	92	May	86
320	Tomato	Marglobe	—	—	87	May	75
Jerome B. Rice Seed Co., Cambridge, N.Y.							
H. J. Croteau Hardware Co., Northampton							
258F	Beet	Improved Early Blood Turnip	70	12/1942	79	May	65
306F	Carrot	Danvers Half Long	55	12/1942	72	May	55
Franklin Hardware & Plumbing Supply Co., Franklin							
518F	Beans	Asgrow Stringless Valentine	—	—	98	May	80

a Below Standard

b Above Standard but below given germination

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination %	Month of Test	Mass. Standard %
Jerome B. Rice Seed Co.—Con.							
1176	Rutabaga	Shurtleff Hardware Co., Middleboro Macomber.....	—	—	99	July	75
J. B. Rice, Jr., Inc., Shushan N. Y.							
37F	Beet	Fred F. Smith, Inc., Reading Detroit Dark Red.....	Approx. 55	11 1942	68	June	65
40F	Beet	Early Blood Turnip.....	Approx. 65	11 1942	59a	July	65
42	Brussels Sprouts (*)	.....	Approx. 70	11 1942	55d	May	70
38F	Carrot	Chantenay Half Long.....	Approx. 70	11 1942	78	May	78
43	Cauliflowerr	Early Snow Ball.....	Approx. 80	11 1942	94	May	75
41	Onion	Yellow Globe Danvers.....	Approx. 80	11 1942	97	May	70
39	Spinach	Bloodsdales Long Standing.....	Approx. 80	11/1942	84	May	60
760	Cabbage	Western Auto Associate Store, Marlboro Mammoth Red Rock.....	Approx. 70	11 1942	66	June	75
761	Lettuce	Early Curled Simpson.....	Approx. 85	11/1942	99	June	80
Ross Bros. Co., Worcester, Mass.							
992	Beans	Arthur W. Baldwin & Co., West Stockbridge Golden Wax.....	90	11 1942	80i	July	80
266F	Corn	Economy Hardware Co., Milford Golden Bantam.....	93	1 1943	94	May	75
265	Peas	Thomas Laxton.....	93	1 1943	92	June	80
1219	Beet	Farm Service Co., West Berlin Early Wonder.....	—	—	79	July	65
621	Cabbage	Franklin Hardware Corp., Springfield Copenhagen Market.....	—	—	79	May	75
534	Peas	Wm. T. Gove & Son, Walpole Nott's Excelsior.....	—	—	94	June	80
535F	Beans	Sure Crop Stringless.....	—	—	94	May	80
811	Cucumber	P. A. Richard Hardware Co., Spencer Long Green.....	—	—	81	June	80
812	Radish	Early Scarlet Globe.....	—	—	90	June	75
809	Rutabaga	Long Island Improved.....	—	—	95	June	75
810	Turnip	Early Purple Top White Globe.....	—	—	93	June	80
766F	Soy Bean	Spag's Hardware Co., Shrewsbury Bansei.....	86	1 1943	76e	May	None
156F	Beans	A. I. Task Co., Inc., Brockton Black Wax, No. 178106.....	90	1 1943	85	May	80
1103	Parsnip	Weld & Beck, Southbridge Hollow Crown.....	—	—	93	June	60
772F	Carrot	Worcester Grain & Coal Co., Worcester Hutchinson.....	—	—	76	June	55
264F	Beet	Leon Zochi Co., Milford Detroit Dark Red.....	73	1 1943	77	May	65
261F	Carrot	Chantenay.....	63	1 1943	60	May	55
Rudy Patrick Seed Co., Kansas City, Mo.							
1224	Cabbage	Western Auto Associate Store, Clinton Jersey Wakefield, No. G-793.....	75	1 1943	75	July	75
1225	Onion	Large Red Wethersfield G757.....	70	1 1943	81	July	70
1223	Parsley	Moss Curled, No. 2270.....	60	1/1943	67	July	60
1222	Pepper	Ruby King, No. 893.....	55	1 1943	49a	July	55
1221	Tomato	Marglobe, No. 2356.....	75	1/1943	93	July	75

a Below Standard

d Below Standard and below given germination

e Below given germination

i Equal to Standard but below given germination

* Variety required but not given

Results of Inspection and Germination of Vegetable Seeds

Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination Date of Test	Found Germination—Month of Test	Mass. Standard
			%	%	%
Rudy Patrick Seed Co.—Con.					
Western Auto Associate Store, Spencer					
814F	Beans	Stringless Green Pod, Burpee's, No. 2399	85	1 1943 81	May 80
813F	Corn	Sunshine	—	— 85	May 75
816	Lettuce	Grand Rapids, No. G-754	80	1/1943 96	June 80
815	Peas	Alaska or Earliest of All, No. 2561	80	1 1943 96	June 80
Western Auto Associate Store, Ware					
1065	Beet	Detroit Dark Red, No. 2130	65	1 1943 79	July 65
1066	Carrot	Danvers Half Long, No. 2653	55	1 1943 72	June 55
1067	Cucumber	Early Cluster, No. 1288	80	1 1943 98	June 80
1068	Parsnip	Hollow Crown	—	— 68	June 60
1069	Turnip	Purple Top White Globe, No. 2667	80	1 1943 97	July 80
Sargent's Grain & Supply Co., Brockton, Mass.					
155F	Beans	Pencil Pod Black Wax	—	— 87	May 75
153F	Beets	Edmond's Blood	—	— 81	May 65
154F	Carrots	Long Orange	—	— 77	May 55
Sears, Roebuck & Co., Chicago Ill.					
Sears, Roebuck & Co., Boston					
370F	Beans	Plentiful	—	— 88	May 80
371	Cucumber	Arlington White Spine	80	12 1942 89	May 80
373	Parsley	Moss Curled	65	12 1942 68	June 60
369	Peas	Montana Monarch	—	— 76a	June 80
372	Radish	Early Scarlet Globe	80	12 1942 96	May 75
374	Squash	Yellow Crookneck	80	12 1942 91	May 75
375	Turnip	Purple Top White Globe	80	12 1942 97	June 80
Sears, Roebuck & Co., Greenfield					
323F	Beet	Crosby's Egyptian	70	12 1942 76	May 65
322F	Carrots	Chantenay	55	12 1942 87	May 55
325	Lettuce	Big Boston	80	12 1942 96	May 80
326	Onion	Yellow Globe Danvers	75	12 1942 86	May 70
324	Spinach	Bloomsdale Savoy Leaved	65	12 1942 92	May 60
Soiless Growers Guild, Barrytown, Mich.†					
Granite City Hardware Co., Quincy					
450	Tomato	Rutgers	—	— 94	July 75
Town Square Hardware & Supply Co., Norwood					
546	Tomato	Break-O-Day	—	— 87	July 75
F. W. Woolworth & Co., Boston					
180	Cabbage	Flat Dutch	—	— 79	July 75
512	Cabbage	Ball	—	— 70a	July 75
179	Lettuce	(*)	—	— 90	July 60
511	Parsley	(*)	—	— 62	July 80
182	Pepper	Ruby King	—	— 93	July 55
181	Tomato	Marglobe	—	— 87	July 75
Joseph Sordillo & Sons, Boston					
45F	Beet	Blood	—	— 77	June 65
49	Broccoli	Cavolo	—	— 95	May 75
48	Cabbage	Savoy	—	— 83	May 75
47F	Carrot	Improved Long Orange	—	— 77	May 55
51	Spinach	Savoy	—	— 75	May 60
James D. Splann Estate, So. Deerfield, Mass.					
337	Squash	Blue Hubbard	—	— 59a	May 75
Sterling Seed Co., Minneapolis, Minn.					
W. T. Grant Co., Boston					
111F	Beet	Extra Early Flat Egyptian	—	— 73	June 65
114F	Carrot	Oxheart	—	— 76	May 55
116	Cauliflower	Early Snowball	—	— 77	May 75
117	Lettuce	Black Seeded Simpson	—	— 82	May 80
W. T. Grant Co., Dorchester					
502	Parsley	Dark Moss Curled	—	— 67	June 60

a Below Standard

* Variety required but not given

† All seed put up by this concern under the brand "Phillips' Magical Soiless Plant Ball"

Results of Inspection and Germination of Vegetable Seeds

Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—% of Test	Month of Test	Mass. Standard %
Sterling Seed Co.—Con.							
W. T. Grant Co.—Con.							
503	Radish	Early Scarlet Turnip.....	—	—	96	May	75
504	Tomato	Dwarf Champion or Tree.....	—	—	79	May	75
505	Turnip	Purple Top Strap Leaved.....	—	—	98	June	80
Stump & Walter Co., New York							
Hamlin's Service Station, Norwood							
547F	Beet	Detroit Dark Red.....	—	—	88	May	65
548	Pepper	Large Bell or Bull Nose.....	—	—	96	May	60
549	Radish	Scarlet Globe.....	—	—	95	May	75
550	Turnip	Purple Top.....	—	—	96	June	80
Hennen's Socony Service, Canton							
405	Cabbage	Late Flat Dutch.....	—	—	91	May	75
403F	Carrot	Selected Chantenay.....	—	—	84	June	55
406	Lettuce	Romaine or Cos.....	—	—	93	May	80
404	Spinach	Savoy Leaved.....	—	—	86	May	60
The Templin Bradley Co., Cleveland, (†)							
Amity Street School, Amherst							
817F	Beans	*Improved Golden Wax.....	92	1, 1943	80f	May	80
820F	Beet	Detroit Dark Red, No. 3576.....	—	—	80	June	65
822	Cabbage	Danish Ballhead.....	—	—	92	June	75
821F	Carrot	Chantenay, No. 3666.....	—	—	70	June	55
824	Carrot	Danvers Half Long.....	—	—	35a	June	55
818F	Corn	Golden Bantam, No. 3700.....	92	1/1943	98	May	75
826	Cucumber	White Spine.....	—	—	95	June	80
827	Lettuce	Improved Hanson.....	—	—	97	June	80
923	Onion	Prizetaker.....	—	—	58a	June	70
828	Parsley	Champion Moss Curled.....	—	—	82	June	60
829	Parsnip	Large Sugar or Hollow Crown.....	—	—	82	June	60
830	Radish	Scarlet Globe.....	—	—	86	June	75
819	Spinach	Longstanding Bloomsdale, No. 4047.....	—	—	3a	May	60
825	Spinach	Victory or Bloomsdale.....	—	—	0a	June	60
831	Tomato	New Stone.....	—	—	92	June	75
John B. Varick Co., Manchester, N. H.							
Harlow Bros. Co., Sterling							
288F	Beet	Crosby's Egyptian.....	—	—	82	May	65
289	Rutabaga	Purple Top.....	—	—	85	June	75
Vaughan Seed Store, New York							
Thomas & Annie J. Cogger, Saugus							
560F	Beet	Crosby's Egyptian.....	—	—	75	June	65
559F	Carrot	Early Chantenay.....	—	—	88	June	55
562	Lettuce	Oak Leaf.....	—	—	92	May	80
561	Radish	Early Scarlet.....	—	—	90	May	75
Your Garden Mart, Framingham							
599	Cucumber	Improved Long Green.....	—	—	80	May	80
600	Parsley	Champion Moss Curled.....	—	—	66	June	60
James Vicks, Seeds, Philadelphia, Pa.							
Ben Franklin Store, Lee							
901-a	Bean	Stringless Green Pod Bush Bean.....	85	12/1942	89	July	80
901-b	Beet	Detroit Dark Red.....	70	12/1942	79	July	65
901-c	Carrot	Vick's Perfection Chantenay.....	60	12/1942	55	June	55
906	Cauliflowerr	Snowball.....	—	—	82	July	75
901-d	Lettuce	Grand Rapids.....	80	12/1942	97	June	80
901-e	Onion	Danvers Yellow Globe.....	75	12/1942	75	June	70
901-f	Radish	White Icicle.....	80	12/1942	92	June	75
901-g	Radish	Vick's Early Scarlet Globe.....	80	12/1942	78	June	75
901-h	Spinach	Bloomsdale Long Standing.....	65	12, 1942	86	June	60
905	Spinach	Bloomsdale Long Standing.....	—	—	84	June	60
F. H. Woodruff & Sons, Milford, Conn.							
Boston Supply, Inc., Framingham							
588F	Beans	French Horticultural.....	87	12/1942	93	May	80
590	Lettuce	Cos. Paris White, No. 1-3316.....	89	10, 1942	93	May	80
589	Onion	White Portugal, No. 17654.....	90	12/1942	98	May	70
591	Tomato	Sreacial Earliana.....	—	—	83	May	75
592	Turnip	White Egg.....	—	—	85	June	80

a Below Standard

f Equal to Standard but below given germination

* Not Improved Golden Wax; found to be Unrivalled Wax in field test

† School Department of this company better known as "Children's Flower Mission."

Results of Inspection and Germination of Vegetable Seeds Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test	Mass. Standard %
F. H. Woodruff & Sons—Con.						
942	Beets	Carr Hardware Co., Pittsfield For Greens, No. 17934 (*)	77	12/1942	67b July	65
566	Beans	Danvers Hardware Co., Danvers				
565F	Beet	Fordhook Bush Lima, No. 1-2108	—	—	81 May	70
567F	Carrot	Crosby's Egyptian	—	—	65 June	65
568	Onion	Red Cored Chantenay, No. 2741	80	1/1943	85 June	55
570	Spinach	Danvers Yellow Globe, No. 17553	90	12/1942	94 May	70
		Round Thick Leaf, No. 181781	—	—	63 May	60
Essex Hardware & Plumbing Supply						
696	Leek	Co., Lawrence American Flag	Approx. 85	12 1942	79 June	60
700	Peas	Easy Money, No. 22631	Approx. 90	12 1942	93 June	80
697	Turnip	Ea. White Flat Dutch	Approx. 90	10, 1942	92 June	80
Farm Service Co., West Berlin						
1218	Cabbage	Danish Ballhead, No. 13443	—	—	67a July	75
1217	Rutabaga	American Purple Top	—	—	95 July	75
1220	Spinach	Long Standing Savoy	—	—	92 July	60
Franklin Hardware Corp., Springfield						
620F	Carrot	Long Orange	75	12/1942	64b June	55
622F	Corn	Golden Sunshine	—	—	97 May	75
623	Cucumber	Boston Pickling, No. 8-71	—	—	83 May	80
Haverhill Hardware & Plumbing Supply						
738	Beans	Co., Haverhill Lima — King of the Garden	—	—	77 July	70
725	Spinach	D. J. Maloney, Haverhill Harlem Market, No. 9-4103	Approx. 79	12/1942	95 May	60
Marlboro Hardware & Supply Co.,						
759	Cucumber	Marlboro Woodruff's Ace, No. 8-481	Approx. 80	12/1942	92 June	80
Middlesex County Farm Bureau Assoc.,						
693F	Carrot	Lowell Danvers Half Long	—	—	59 June	55
694	Squash	Conn. Straight Neck	—	—	84 June	75
Middlesex County Farm Bureau Assoc.,						
233F	Beans	Waltham Sure Crop Black Wax, No. 21896	90	12 1942	96 May	80
232F	Beet	Woodruff's Early Wonder, No. 1-378	—	1943	60a June	65
234F	Beet	Special Crosby Egyptian, No. 1-482	73	12 1942	78 June	65
227	Cabbage	Copenhagen Market	78	2/1943	75 May	75
237	Cabbage	Copenhagen Market, No. 22310	75	1 1943	89 May	75
230F	Carrot	Hutchinson	65	2 1943	84 May	55
235F	Carrot	Danvers Half Long, No. 19697	68	1/1943	77 May	55
236F	Carrot	Morse's Bunching, No. 22398	82	1 1943	91 May	55
238F	Corn	Marcross 6.13, No. 21917	90	12 1942	95 May	75
229	Lettuce	N. Y. No. 12, No. 22017	96	2 1943	97 May	80
228	Parsley	Paramount, No. 13328	88	2/1943	88 May	60
226	Spinach	Va. Blight Resistant	75	2 1943	81 May	60
231	Turnip	Purple Top White Globe, No. 17299	90	2 1943	89 May	80
Middlesex County Farm Bureau Assoc.,						
1127	Squash	South Weymouth Blue Hubbard, No. 1-4295	Approx. 80	1 1943	87 June	75
Middlesex County Farm Bureau Assoc.,						
601	Peas	Worcester Improved Telephone	—	—	88 June	80
Milford Hardware Co., Milford						
275	Parsnip	Hollow Crown	—	—	80 May	60
271	Spinach	Reselected Bloomsdale or Savoy	—	—	83 May	60

a Below Standard

b Above Standard but below given germination

* Variety required but not given

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination %	Given Date of Test	Found Germination—Month % of Test	Mass. Standard %
F. H. Woodruff & Sons—Conn.						
E. A. Noble & Co., Stockbridge						
987	Swiss Chard	Lucullus, No. 22337.....	90	12/1942	72b June	65
Peirson Hardware Co., Pittsfield						
967	Carrot	Chantenay.....	84	1943	73b June	55
968	Lettuce	Iceberg.....	—	—	95 June	80
971	Radish	French Breakfast.....	—	—	92 June	75
970	Turnip	White Globe.....	—	—	60a July	80
Pittsfield Hardware & Plumbing Supply Co., Pittsfield						
949	Lettuce	Dark Green Cos or Romaine.....	—	3 1943	84 June	80
Rome Bros. Hardware Co., Rockland						
467F	Beet	Ea. Wonder, No. 18708.....	77	12 1942	76 May	65
470	Cantaloupe	Honey Dew, No. 1-211.....	—	—	82 June	75
Approx.						
466F	Corn	Early Evergreen, No. 16148.....	90	12 1942	92 May	75
468	Cucumber	Woodruff's Hybrid.....	90	12 1942	97 May	80
Approx.						
469	Radish	Scarlet Globe.....	90	12 1942	94 May	75
Sanborn & Damon Co., Quincy						
379F	Corn	Evergreen.....	—	—	76 May	75
Sanford Hardware Co., Fall River						
1250	Beet	Crosby's Egyptian.....	—	—	60a Aug.	65
1249	Carrot	Oxheart.....	—	—	9a July	55
1247	Lettuce	Big Boston.....	—	—	81 July	80
1248	Rutabaga	Macomber.....	—	—	95 July	75
J. B. Sibley & Son, Ware						
1075	Lettuce	True Iceberg.....	—	—	97 June	80
Approx.						
1074	Pumpkin	Conn. Field, No. 22597.....	89	12 1942	94 June	75
James D. Splann Estate, So. Deerfield						
335F	Beet	Detroit Dark Red, No. 21890.....	65	1 1943	76 June	65
338F	Corn	Golden Bantam 8 Row, No. 20061.....	—	—	95 May	75
Town Sq. Hardware & Supply Co., Norwood						
543F	Beet	Detroit Dark Red, No. 1-431.....	80	11 1942	59d June	65
542F	Carrot	Chantenay.....	88	11 1942	86 June	55
545	Lettuce	Black Seeded Big Boston.....	90	11 1942	98 May	80
Approx.						
541	Peas	Gradus, No. 6-4202.....	90	12-1942	92 June	80
Approx.						
544	Rutabaga	Improved Long Island.....	90	10 1942	99 June	75
Treat Hardware Co., Lawrence						
744F	Beet	Ea. Wonder Green Leafed, No. 1-440.....	79	10 1942	79 June	65
741F	Carrot	Bagley.....	74	11 1942	76 June	55
742F	Corn	Sencross, No. 15925.....	—	—	96 May	75
743F	Corn	Woodruff's Earligold, No. 20070.....	89	12 1942	96 May	75
745	Spinach	Bloomdale Long Standing Savoy, No. 9-4111.....	92	12 1942	92 May	60
Waldron Hardware Co., Taunton						
189F	Beans	Dwarf Horticultural, No. 2-735.....	—	—	45a May	80
183F	Beet	Early Wonder.....	—	—	92 June	65
187	Cabbage	Copenhagen Market.....	—	—	86 May	75
192	Celery	Giant Pascal.....	—	—	94 May	55
191	Egg Plant	Black Beauty.....	—	—	64 May	65
186	Lettuce	N. Y. No. 12, No. 20020.....	—	—	94 May	80
188	Pepper	California Wonder.....	—	—	82 April	55
S. D. Woodruff & Sons, Orange, Conn.						
Adams Hardware & Paint Co., Lowell						
687	Beet	Crosby's Egyptian, No. 2288.....	70	12 1941	65 June	65
689	Cabbage	Jersey Wakefield.....	—	—	75 June	75
686	Lettuce	Big Boston.....	95	11/ 1942	97 June	80

a Below Standard

b Above Standard but below given germination

d Below standard and below given germination. Wholesaler claims this seed was shipped to retailer with tag stating "Below Stand. Germ. 59%—tested 11/1942."

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—% of Test	Month of Test	Mass. Standard %
S. D. Woodruff & Sons—Con.							
407F	Beet	Allen Hardware Co., Needham	73	2 1943	79	May	65
408F	Carrot	Detroit Dark Red, No. 2612	71	2 1943	76	June	55
653	Endive	Danvers Half Long, No. 2611	—	—	87	June	70
W. E. Aubuchon Co., Inc., Gardner							
653	Endive	Broad Leaf I. Batavian	—	—	87	June	70
Baker Hardware Co., Wellesley							
415F	Beans	Fordhook Bush Lima, No. 2400	85	1 1943	89	May	70
598-b	Beans	Stringless Black Valentine	87	12 1942	89	July	80
598-c	Beans	Fordhook Bush Lima	86	12 1942	88	July	70
598-d	Beans	Improved Golden Wax	85	12 1942	75d	July	80
416F	Beet	Crosby's Egyptian, No. 2465	65	1 1943	65	May	65
598-g	Beet	Early Wonder	80	11 1942	73	July	65
598-h	Carrot	Chantenay	55	11 1942	49a	July	55
598-e	Corn	Early Spangloss	75	12 1942	56d	July	75
598-i	Corn	Stowell's Evergreen	85	1 1943	90	July	75
598-j	Cucumber	Stay-Green	81	1 1943	94	July	80
598-k	Lettuce	Big Boston	93	11 1942	93	July	80
598-l	Parsley	Moss Curled	76	11 1942	78	July	60
598-a	Peas	Surprise Med. Early Sweet	81	12 1942	91	July	80
598-m	Radish	Scarlet Globe	76	11 1942	81	July	75
598-n	Spinach	Bloomsdale Savoy	80	11 1942	82	July	60
598-o	Squash	Summer Straightneck	93	11 1942	95	July	75
598-i	Swiss Chard	Giant Ribbed	76	11 1942	75	July	65
598-p	Turnip	Purple Top White Globe	93	11 1942	89	July	80
A. J. Bibeau Hardware Co., Gardner							
651F	Beet	Ea. Blood Turnip	—	—	71	June	65
650F	Corn	Woodruff's Extra Early Yellow	—	—	93	May	75
647	Onion	Yellow Globe Danvers, No. 2701	80	1-1943	92	June	70
649	Rutabaga	Am. Purple Top No. 2650	90	2 1943	97	June	75
A. T. Chase Corp., Dedham							
488F	Beet	Crosby's Egyptian, No. 2500	65	2 1943	57a	June	65
487F	Corn	Country Gentleman, No. 2725	83	1 1943	88	May	75
Danvers Hardware Co., Danvers							
569	Broccoli	Calabrese, No. 2505	95	1 1943	98	May	75
572	Squash	Warren Turban, No. 2681	72	1 1942	88	May	75
Depping & Moore, Inc., Westfield							
895	Kale	Dwart Siberian	—	—	41a	July	75
894	Lettuce	Iceberg N. Y. Head	—	—	77a	June	80
896	Swiss Chard	(*)	—	—	83	June	65
897	Squash	Giant Crookneck, No. 2431	90	11 1942	85	June	75
Felix's Hardware Co., Clinton							
1229	Cabbage	Danish Ballhead	—	—	84	July	75
1228	Radish	Early Scarlet Turnip White Tip	—	—	87	July	75
1230	Rutabaga	Long Island	—	—	75	July	75
The Fiske Corporation, Natick							
596F	Beans	Golden Wax, No. 2522	84	2 1943	84	May	80
G. W. Gardiner & Son, Fall River							
1243	Carrot	Danvers Half Long, No. 2750	67	5 1943	83	July	55
Marlboro Hardware & Supply Co., Marlboro							
758	Beans	Bountiful, No. 3395	—	—	87	June	80
Monroe's Seed Market, Attleboro							
399F	Beet	Detroit Dark Red, No. 2501	65	11 1942	65	May	65
401F	Beans	Sure Crop Wax, No. 2626	90	12 1942	81b	May	80
398F	Carrot	Danvers Half Long, No. 2178	57	2 1942	66	June	55
400F	Corn	Marcross 13.6, No. 2722	78	3 1943	71a	May	75
402	Peas	Blue Bantam, No. 2567	86	2 1943	94	July	80
Palmer Hardware Co., Needham							
411	Peas	Nott's Excelsior	85	2 1943	94	July	80

a Below Standard

b Above Standard but below given germination

d Below Standard and below given germination

* Variety required but not given.

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination %	Date of Test	Found Germination—Month of Test %	Mass. Standard %
S. D. Woodruff & Sons—Con.						
George Warren, Braintree						
459F	Beans	French Horticultural.....	85	2 1943	98 May	80
460F	Beet	Early Wonder Beet, No. 2500.....	65	11/1942	57a June	65
457F	Carrot	Morse's Bunching, No. 2622.....	70	3 1942	67 June	55
458	Cucumber	A & C.....	—	—	80 May	80
462	Radish	Early Scarlet Globe.....	—	—	84 May	75
461	Rutabaga	*Rutabaga Turnip.....	—	—	70a June	80
Woodworth Bradley, Inc., Providence, R. I.						
Schofield Hardware Co., No. Attleboro						
386	Parsnip	Hollow Crown.....	75	1 1943	70 June	60
Unknown						
Centre Hardware Co., Roslindale						
481	Beans	Pencil Pod Wax.....	61	4 1942	41d Aug.	80
Danvers Hardware Co., Danvers						
563	Cabbage	Charleston Wakefield.....	—	—	10a May	75
564	Cabbage	All Seasons.....	—	—	3a May	75
Granite City Hardware Co., Quincy						
452	Peas	Sutton's Excelsior.....	—	—	87 June	80
Harding St. Grain Store, Worcester						
613F	Beans	Yellow Eye.....	—	—	3a May	80
1255	Beet	Eclipse.....	—	—	39a July	65
1269	Cabbage	Danish Ballhead.....	—	—	1a July	75
1270	Cabbage	Late Drumhead.....	—	—	0a July	75
612	Corn	Golden Bantam.....	—	—	77 May	75
1257	Cucumber	Early Cluster.....	—	—	11a July	80
616	Onion	Southport Yellow Globe.....	—	—	0a May	70
1268	Onion	Southport Yellow Globe.....	—	—	0a July	70
1265	Pumpkin	Conn. Field.....	—	—	6a July	75
1260	Radish	Crimson Giant.....	—	—	72a July	75
1261	Radish	French Breakfast.....	—	—	17a July	75
617	Spinach	Bloomsdale Savoy.....	85	10/1937	0a May	60
1262	Squash	Green Hubbard.....	—	—	0a July	75
1263	Squash	Giant Summer Crookneck.....	—	—	3a July	75
1264	Squash	Boston Marrow.....	—	—	0a July	75
Norwood Hardware & Supply Co., Norwood						
539	Turnip	Yellow Globe.....	—	—	14a June	75
Perron & Company, Southbridge						
1108	Peas	Nott's Excelsior.....	—	—	81 July	80
**Wholesaler Not Given						
Adams Hardware & Paint Co., Lowell						
688	Cabbage	Copenhagen Market.....	—	—	21a June	75
690	Cabbage	Danish Ballhead.....	—	—	56a June	75
684	Onion	Yellow Globe, No. 30 W.....	70	12/1941	12d June	70
685	Onion	White Portugal, No. 2231.....	75	12/1941	38d June	70
692	Turnip	Red Globe.....	—	—	88 June	80
Allen Hardware Co., Needham						
410	Lettuce	Iceberg.....	—	—	0a May	80
W. E. Aubuchon Co., Inc., Clinton						
1234	Cabbage	Hollander or Danish Ballhead.....	—	—	47a July	75
1235	Cabbage	Premium Late Flat Dutch.....	—	—	66a July	75
1233	Lettuce	Big Boston.....	—	—	68a July	80
W. E. Aubuchon Co., Inc., Hudson						
1212	Cabbage	Premium Late Flat Dutch.....	—	—	21a July	75
W. E. Aubuchon Co., Inc., Orange						
635	Lettuce	Big Boston.....	85	12/1938	0a June	80
W. E. Aubuchon Co., Inc., Shelburne Falls						
1034	Cabbage	Danish Ballhead Imported.....	—	—	2a July	75

a Below Standard

d Below Standard and below given germination

* Variety required but not given. A Rutabaga incorrectly labeled turnip.

**Wholesaler not named because retailer admits, or wholesaler claims, that the following lots of vegetable seeds were not purchased by the retailer during the current year.

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination % Date of Test	Found Germination—Month of Test	Mass. Standard %
Wholesaler Not Given—Con.					
1071	Lettuce	W. E. Aubuchon Co., Inc., Ware Prizehead W. S.	—	18a July	80
656	Spinach	The Bengtson Hardware Co., Gardner Bloomsdale.	—	57a May	60
648F	Carrot	A. J. Bibeau Hardware Co., Gardner Woodruff's Bunching.	—	55 June	55
729	Cabbage	Bryant's Hardware Co., Haverhill Danish Ballhead.	—	43a June	75
1024	Cabbage	Burlingame & Darby's Co., No. Adams Early Winningstadt.	—	0a July	75
471	Parsnip	C & D Hardware & Plumbing Supply Co., Rockland Hollow Crown.	—	25a June	60
661F	Beet	Davis Hardware Co., Gardner Edmond's Early Blood.	—	50a June	65
571	Lettuce	Danvers Hardware Co., Danvers Big Boston.	—	70a May	80
912	Cabbage	Dresser-Hull Co., Lee.	—	48a July	75
915	Peas	Early Winningstadt.	—	0a June	80
698	Cabbage	Essex Hardware & Plumbing Supply Co., Lawrence Savoy.	43	3. 1943 43a June	75
517	Celery	Franklin Hardware & Plumbing Supply Co., Franklin Giant Pascal.	—	43a July	55
615F	Carrot	Harding Street Grain Store, Worcester Oxheart.	—	3a June	55
1253	Carrot	Oxheart.	—	4a July	55
1256	Cucumber	Early Fortune.	—	38a July	80
1258	Cucumber	Boston Pickling.	—	16a July	80
1259	Cucumber	Davis Perfect.	—	48a July	80
611	Peas	Laxton's Progress.	—	67a July	80
287F	Carrot	Harlow Bros. Sterling Danvers Half Long.	—	32a May	55
740	Brussels Sprouts	Haverhill Hardware & Plumbing Supply Co., Haverhill Long Island Improved.	—	54a June	70
739	Celery	Golden Plume.	—	52a Aug.	55
737	Leek	(*)	—	48a June	60
735	Onion	Southport White Globe.	—	49a June	70
736	Onion	Red Wethersfield.	—	28a June	70
734	Peas	Leavitt's Sport Shop, Haverhill Laxton's Progress.	—	76a June	80
878	Melon	Methe's Checkerboard Feed Store, Westfield **Cucumber.	—	82 June	80
272	Cabbage	Milford Hardware Co., Milford Danish Ballhead.	—	62a May	75
273	Lettuce	New York or Wonderful.	—	70a May	80
274	Pepper	Pimento.	—	38a May	55
540	Lettuce	Norwood Hardware & Supply Co., Norwood Big Boston.	—	3a May	80

a Below Standard

* Variety required but not given

** Seed found to be Melon—not Cucumber as labeled

Results of Inspection and Germination of Vegetable Seeds
Section 261-D—Continued

Lab No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Given Germination Date of Test	Found Germination—Month of Test	Mass. Standard %
Wholesaler Not Given—Con					
362	Onion	The O. B. Parks Co., Westfield Danvers Flat	--	7a June	70
705	Celery	F. X. Robichaud, Methuen Golden Self Blanching . . .	--	5a July	55
706	Erg Plant	Leonard's New York Purple . .	--	62 June	60
1246	Beans	Samord Hardware Co., Fall River Dwarf Horticultural	--	23a July	80
1241	Kale	C. S. Sawyer & Co., Fall River Tall Curled Scotch	--	25a July	75
1239	Lettuce	Early Curled Simpson	--	25a July	80
1242	Lettuce	Black Seeded Tennisball	--	73a July	80
185	Spinach	Waldron Hardware Co., Taunton Bloomsdale Long Standing Savoy	--	44a May	60
1102	Cabbage	Weld & Beck, Southbridge Early Savoy	--	83 July	75
1101	Lettuce	Romaine or Cos	--	78a June	80

a Below Standard

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted in Conjunction with the Department of Olericulture

Grant B. Snyder Professor

Tests are conducted by the Experiment Station each year to determine the trueness to type of vegetable seeds which are offered for sale by seedsmen in this State. Seed samples of beans, sweet corn, carrots, beets and spinach were purchased from various stores and seed dealers by State Inspectors and sent to the Massachusetts Agricultural Experiment Station at Amherst, where the Department of Olericulture sowed the seed in field test plots in order to compare plant characteristics with the labeled variety name.

The soil of the test plot is a fine, sandy loam and is naturally fertile. The land was well prepared and a liberal quantity of fertilizer was applied broadcast and harrowed into the soil prior to seeding. Growth and development was generally satisfactory except for the spinach trials the seed of which was planted during the late summer. This crop was a failure, hence no records are included in this report.

Yields of the various crops were not measured because of the necessity of using small plots and also because replication of the plantings was not feasible due to the large number of strains and varieties that were compared. Conformity to type has been the measure of comparison in these tests and individual plants have been called off-type when they could not be classified in a group of plants ranging fairly close to the average for the particular strain or variety under consideration.

In studying the comparative type characters and performance records it is plainly evident that all but a few of the stocks were true to name and description and most of them were highly productive. In a few instances it appeared that the variety had been misnamed or misrepresented. This was probably due to the seed shortage during 1943 as well as to inexperienced help that many seedsmen were forced to employ.

The source of the seed and the laboratory germination records are to be found in the tables on pages 28-52, where the lots of seed used in the field tests are identified by the letter "F" added to the laboratory number. Those seeds tested in the field and not included in the following table were 100% true to type.

Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed and Variety	True to Type Percent	Remarks
BEANS			
368F	Burpee's Stringless Wax.....	None	Not a Wax Bean; appears to be Burpee's Stringless Green Pod
176F	Golden Wax.....	99	1% vining habit
817F	Golden Wax Improved.....	None	Not Golden Wax appears to be Unrivalled Wax
284F	Pencil Pod Black Wax.....	99	1% Flat pods
310F	Pencil Pod Black Wax.....	None	Not a Pencil Pod Black Wax; 100% Flat Podded
613F	Yellow Eye.....	None	None Germinated
BEETS			
426F	Beats All.....	98	2% Oblong
45F	Blood.....	98	2% Light Color
78F	Crosby's Egyptian.....	92	8% Top Shape
87F	Crosby's Egyptian.....	98	2% Long
173F	Crosby's Egyptian.....	94	4% Spindle—2% Long
219F	Crosby's Egyptian.....	90	10% Spindle
263F	Crosby's Egyptian.....	94	6% Long Top
307F	Crosby's Egyptian.....	92	8% Long Top
323F	Crosby's Egyptian.....	96	4% Long Top
416F	Crosby's Egyptian.....	96	4% Top Shape
422F	Crosby's Egyptian.....	96	4% Spindle
436F	Crosby's Egyptian.....	88	8% Spindle—4% Top Shape
488F	Crosby's Egyptian.....	98	2% Top Shape
560F	Crosby's Egyptian.....	88	10% Long Top—2% Light Color
565F	Crosby's Egyptian.....	92	8% Long Top
654F	Crosby's Egyptian.....	88	8% Long Top—4% Blocky
682F	Crosby's Egyptian.....	94	6% Spindle
174F	Detroit Dark Red.....	94	2% Long—4% Flat
249F	Detroit Dark Red.....	90	10% Spindle
317F	Detroit Dark Red.....	94	6% Long Top
366F	Detroit Dark Red.....	92	8% Long Top
385F	Detroit Dark Red.....	96	2% Flat—2% Long
392F	Detroit Dark Red.....	94	6% Obovate
399F	Detroit Dark Red.....	94	4% Flat—2% Spindle
407F	Detroit Dark Red.....	94	2% Spindle—2% Obovate—2% Flat
429F	Detroit Dark Red.....	98	2% Long Top
547F	Detroit Dark Red.....	88	10% Flat—2% Long Top
642F	Detroit Dark Red.....	98	2% Spindle
614F	Dewing's Early Blood Turnip.....	90	10% Long Top
17F	Early Blood Turnip.....	98	2% Globe
199F	Early Blood Turnip.....	92	8% Long
29F	Early Blood Turnip.....	92	8% Long
351F	Early Blood Turnip.....	98	2% Long Top
636F	Early Blood Turnip.....	94	6% Long Top
651F	Early Blood Turnip.....	92	4% Long Top—4% Spindle
7F	Early Wonder.....	96	4% Globe
63F	Early Wonder.....	98	2% Globe
118F	Early Wonder.....	88	12% Long Top
183F	Early Wonder.....	94	6% Long
341F	Early Wonder.....	92	8% Globe
361F	Early Wonder.....	96	4% Oblong
381F	Early Wonder.....	96	4% Globe
453F	Early Wonder.....	98	2% Globe
467F	Early Wonder.....	92	8% Long Top
527F	Early Wonder.....	92	8% Long Top
744F	Early Wonder.....	94	6% Long Top
153F	Edmand's Blood.....	96	4% Long Top
523F	Edmand's Blood.....	90	10% Long Top
661F	Edmand's Blood.....	94	6% Spindle

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed and Variety	True to Type Percent	Remarks
CARROTS			
741F	Bunching.....	—	Very much like Hutchinson
648F	Bunching.....	—	Very much like Hutchinson
674F	California Peerless.....	99	1% very much light colored
8F	Chantenay.....	99	1% Long
70F	Chantenay.....	99	1% White roots
396F	Chantenay.....	—	This is a very poor strain Resembles Danvers closely
38F	Chantenay Half Long.....	97	3% Long Tapering
119F	Chantenay Half Long.....	96	4% Long Tapering
29F	Chantenay Red Cored.....	98	2% Long Tapering
283F	Danvers.....	96	4% Light lemon colored
391F	Danvers.....	98	2% Light lemon color
2F	Danvers Half Long Improved.....	97	3% Long Hairy Roots
74F	Danvers Half Long.....	94	6% very Stump Rooted
107F	Danvers Half Long.....	98	2% Light Lemon Color
202F	Danvers Half Long.....	—	This is a strain of Chantenay
308F	Danvers Half Long.....	90	10% very Stump Rooted
575F	Danvers Half Long.....	98	2% Light Lemon Color
681F	Danvers Half Long.....	98	2% Light Lemon Color
693F	Danvers Half Long.....	99	1% White Roots
296F	Hutchinson.....	98	2% Light Lemon Color
340F	Hutchinson.....	96	4% White Roots
342F	Hutchinson.....	96	4% White Roots
514F	Hutchinson.....	98	2% White Roots
730F	Hutchinson.....	—	No germination
138F	Imperator.....	98	2% very stump rooted
28F	Improved Long Orange.....	94	1% white—5% lemon yellow
47F	Improved Long Orange.....	—	This is Hutchinson—not Long Orange
449F	Improved Long Orange.....	98	2% very light colored
478F	Improved Long Orange.....	—	This is a strain of Hutchinson
149F	Long Orange.....	97	2% Light Lemon Color—1% long hairy root
154F	Long Orange.....	98	2% light Lemon Color
441F	Long Orange.....	99	1% light Lemon Color
602F	Long Orange.....	96	4% Very Thick Heavy Roots
620F	Long Orange.....	96	4% Light Colored
615F	Oxheart.....	—	No seed germinated
CORN			
818F	Golden Bantam.....	—	This is definitely not Golden Bantam but is probably Marcross 13.6
344F	Golden Cross Bantam.....	—	This is not Golden Cross Bantam but is Marcross 13.6
428F	Golden Cross Bantam.....	97	3% Red Tassels
394F	Improved Golden Bantam.....	—	This is Golden Cross Bantam— 3% off-type—red tassels

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer Professor

For the eighth season the Department of Floriculture has cooperated with the Seed Laboratory in conducting trials to determine the quality of flower seeds offered for sale in retail seed stores, hardware stores, chain stores, schools, and other retail outlets. The seeds, collected by the State Seed Inspector, were tested for germination and performance under field conditions.

All seeds were sown on July 6, a rather late date for the sowing of many kinds of annuals. The first killing frost occurred on October 6, giving a growing season of 91 days.

Seeds of 225 lots, representing 55 genera, packeted by 34 concerns, and obtained from 59 retailers, were distributed as follows:

Adonis.....	1	Gila.....	1
Ageratum.....	5	Gypsophila.....	5
Alyssum.....	5	Helianthus (Sunflower).....	1
Amaranthus.....	1	Helichrysum (Strawflower).....	3
Anchusa.....	1	Iberis (Candytuft).....	6
Anoda.....	2	Impatiens (Balsam).....	4
Antirrhinum (Snapdragon).....	8	Ipomoea (Morning Glory).....	3
Aster tanacetifolius (Tahoka Daisy).....	1	Kochia (Mexican Fire Bush).....	2
Brachycome (Swan River Daisy).....	1	Linum (Flax).....	2
Calendula.....	7	Lobelia.....	2
Callistephus (Aster).....	14	Lupinus (Lupine).....	2
Cassia.....	1	Mathiola (Stock).....	3
Celosia (Cockscomb).....	5	Mirabilis (Four-o'clock).....	3
Centaurea (including Bachelor's Button).....	10	Nemophila.....	1
Chrysanthemum.....	1	Nicotiana.....	1
Cleome.....	1	Papaver (Poppy).....	3
Cosmidium.....	1	Petunia.....	18
Cosmos.....	6	Pilox.....	2
Crotolaria (Golden Sweet Pea).....	1	Reseda (Mignonette).....	3
Cynoglossum.....	2	Salpiglossis.....	2
Delphinium (Larkspur).....	3	Scabiosa.....	7
Dianthus (Carnations and Pinks).....	6	Tagetes (Marigold).....	14
Didiscus (Blue Lace Flower).....	2	Tropaeolum (Nasturtium).....	4
Dimorphotheca (African Daisy).....	3	Verbena.....	6
Eschscholtzia (California Poppy).....	5	Vinca.....	2
Euphorbia.....	2	Viola.....	1
Gaillardia.....	4	Zinnia.....	24
Geum.....	1		
		TOTAL.....	225

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair", between one-third and two-thirds; "poor", for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, with only one-third or less of the plants not true to form or color; "fair", between one-third and two-thirds not true; and "not satisfactory" if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. However, since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

Results of the test on germination are summarized as follows:

	NUMBER OF LOTS	PERCENT OF TOTAL
Good.....	105	46.67
Fair.....	46	20.44
Poor.....	66	29.33
None.....	8	3.56
Total.....	225	100.00

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germi- nation	Performance
100F	Cassia	Joseph Breck & Sons, Boston, Mass.	Poor	Not satisfactory
97F	Crotalaria	Gold Coin Flower.....	Poor	Not satisfactory
105F	Dianthus	Retusa.....	Fair	Satisfactory
		Breck's Geisha Girl, Single & Double		7 colors
99F	Nicotiana	Breck's Snowstorm.....	Poor	Not satisfactory
98F	Petunia	Flaming Velvet, Single Bedding...	Poor	Not satisfactory
103F	Petunia	Igloo, Dwarf Bedding.....	Poor	Not satisfactory
104F	Tagetes	Double French, Sunkist.....	Good	Satisfactory
106F	Tagetes	Signata Pumila, Gold Dust-Single Fr.....	Fair	Satisfactory
101F	Zinnia	Fantasy Melody.....	Good	Satisfactory
102F	Zinnia	Zulu Queen, Deep Maroon.....	Good	Satisfactory
		W. Atlee Burpee Co., Philadelphia, Pa.		
750F	Eschscholtzia	Brad's Hardware Co., Maynard Sunset Mixture.....	Poor	Not satisfactory
751F	Helichrysum	Strawflower.....	Fair	Incomplete; had not bloomed October 4
		Franklin Hardware & Plumbing Supply Co., Franklin		
519F	Zinnia	Burpee's Super Giants, Mixed Colors.....	Good	Satisfactory 4 colors
		A. C. Freeman Hardware, Whitman		
1136F	Anchusa	Blue Bird.....	Good	Satisfactory
1137F	Celosia	Plumosa Mixed.....	Good	Satisfactory 3 colors
1138F	Cosmos	Early Flowering Burpee's Golden	Good	Satisfactory
1139F	Scabiosa	Tall Double Mixed.....	Poor	Not satisfactory
		United Cooperative Society, Maynard		
756 F	Tagetes	Marigolds on Parade.....	Good	Incomplete; only 2 plants in bloom October 4
757F	Zinnia	Zinnias on Parade, Special Mixture of Giant Varieties	Good	Satisfactory 8 colors
		Victory Auto Supplies, Fitchburg		
670F	Papaver	Fordhook Hybrids.....	Poor	Not satisfactory
		Waite Hardware Co., Webster		
1116F	Antirrhinum	Half Dwarf Mixed.....	Poor	Not satisfactory
1114F	Centaurea	Jubilee Gem.....	Fair	Satisfactory
1117F	Centaurea	Sweet Sultan Mixed.....	Good	Incomplete; had not bloomed October 4
1115F	Scabiosa	Tall Double Mixed.....	Poor	Not satisfactory
1118F	Verbena	Giant Mixed.....	Poor	Not satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
1097F	Amaranthus	Chase Nursery, Winchendon, Mass.		
1098F	Calendula	G. C. Winter Co., Southbridge	Good	Satisfactory
1096F	Callistephus	Annual.....	Poor	Not satisfactory
		Pot Marigold.....	Poor	Not satisfactory
		Wilt Resistant.....		
		Crosman Seed Corp. East Rochester, N. Y.		
		S. S. Kresge Co., Springfield		
843F	Alyssum	Dwarf, Pure White.....	Good	Satisfactory
846F	Brachycome	Daisy Brachycome, Mixed Colors	Poor	Not Satisfactory
844F	Didiscus	Queen Anne's.....	Good	Incomplete; had not bloomed October 4
845F	Gaillardia	Double Blanket Flower, Mixed..	Good	Incomplete; had not bloomed October 4
847F	Kochia	Mexican Fire Bush or Summer Cypress.....	Good	Satisfactory
848F	Petunia	General Dodds (Scarlet).....	Poor	Not satisfactory
1039FA	Petunia	No. 1 Snowball, Pure White.....	Poor	Not satisfactory
1039FB	Petunia	No. 2 Rosy Morn, Soft Pink.....	Fair	Satisfactory
1039FC	Petunia	No. 3 General Dodds, Scarlet.....	Fair	Satisfactory
1039FD	Petunia	No. 4 Violacea, Deep Purple.....	Poor	Not Satisfactory
1039FE	Petunia	No. 5 Striped and Blotched, Mixed Colors.....	Good	Satisfactory 6 colors
1039FF	Petunia	No. 6 Heavenly Blue (Light Sky Blue).....	Good	Not satisfactory 6 colors
849F	Scabiosa	Pincushion, Tall Double Mixed	Fair	Incomplete; had not bloomed October 4
1037F	Zinnia	Mexican Zinnia Planned Garden	Good	Satisfactory 6 colors
		Pittsfield Hardware & Plumbing Supply Co., Pittsfield		
953F	Antirrhinum	Giant Antirrhinum, Mixed Colors	Fair	Incomplete; 1 plant in bloom October 4
952F	Salpiglossis	Mixed colors.....	Poor	Not satisfactory
928F	Calendula	Platt & Goslee, Great Barrington	Good	Satisfactory
927F	Helianthus	Mixed Colors and Types.....	Good	Satisfactory
		Double Imported Strain.....		
		Deerington Zinnia Gardens, Bargersville, Ind.		
1036F	Zinnia	S. S. Kresge Co., Boston	Good	Satisfactory 5 colors
		Deerington Special—Double Bloom—Mixed Colors		
851F	Zinnia	S. S. Kresge Co., Springfield	Good	Not satisfactory 3 colors
		Deerington Special New Royal Golden-Orange.....		
		Thomas W. Emerson Co., Beverly, Mass.		
1149F	Antirrhinum	Drive-In-Fruitland, Boston	Fair	Incomplete; had not bloomed October 4
		Rust Resistant, Mixed.....		
1145F	Gaillardia	Double Mixed.....	Fair	Incomplete; had not bloomed October 4
1147F	Gilia	Mixed.....	None	
1148F	Lobelia	Annual.....	Fair	Incomplete; had not bloomed October 4
1146F	Verbena	Royal Bouquet.....	Poor	Not satisfactory
		Yankee Maid Products, Inc., Boston		
1042F	Petunia	Ruffled Martha Washington....	None	
1041F	Tagetes	Dwarf French Mixed.....	None	
1043F	Zinnia	Giant Flowering, Yellow.....	Good	Satisfactory
		Ferry-Morse Seed Co., Detroit, Mich.		
		Forbes & Wallace, Inc., Springfield		
1048F	Antirrhinum	Giant Bedding, White.....	Poor	Not satisfactory
1050F	Centaurea	Jubilee Gem.....	Good	Satisfactory
1049F	Lobelia	Celestial or True Blue.....	Poor	Not satisfactory
1051F	Verbena	Scarlet.....	None	
1140F	Eschscholtzia	A. C. Freeman Hardware, Whitman	Fair	Satisfactory
		Extra Golden.....		

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
890F	Dianthus	Ferry-Morse Seed Co.—Con. M. N. Landau, Inc., Westfield Double, Carnation Shades.....	Fair	Satisfactory 7 colors
748F	Callistephus	Maynard Supply Co., Maynard Giant Crego Purple.....	Good	Incomplete; had not bloomed October 4
1123F	Cleome	Union Florist Co., Boston Giant Pink Queen.....	Good	Satisfactory
1125F	Geum	Double Scarlet.....	Poor	Not satisfactory
1124F	Gypsophila	Covent Garden Market Baby's Breath.....	Good	Satisfactory
1122F	Iberis	Umbellata Mixed.....	Good	Satisfactory 5 colors
1126F	Scabiosa	Giant Annual Mixed.....	Good	Incomplete; had not bloomed October 4
		Ben Franklin Stores, Chicago, Ill. Ben Franklin Store, Lee		
908F	Calendula	Yellow Colossal.....	Good	Satisfactory
910F	Eschscholtzia	Mixed.....	Fair	Satisfactory
909F	Scabiosa.....	Tall Double Mixed.....	Poor	Not satisfactory
		Fraser's Wellesley, Mass. Winer's Hardware Co., Whitman		
1133F	Antirrhinum	Mixture.....	Poor	Not satisfactory
1131F	Cosmos	True Early Mixed Mammoth Single.....	Good	Satisfactory
1132F	Petunia	Mixed.....	Poor	Not satisfactory
		Fredonia Seed Co., Fredonia, N. Y. Public Market, West Stockbridge		
996F	Antirrhinum	Finest Mixed.....	Good	Satisfactory
997F	Gaillardia..	Finest Double Mixed.....	Fair	Incomplete; had not bloomed October 4
998F	Gypsophila	Baby's Breath, Large Flowers...	Good	Satisfactory
		Genessee Valley Seed Co., Dalton N. Y. S. S. Kresge Co., Boston		
1038FA	Zinnia	White.....	Good	Satisfactory
1038FB	Zinnia	Crimson.....	Good	Satisfactory
1038FC	Zinnia	Scarlet.....	Good	Satisfactory
1038FD	Zinnia	Yellow.....	Good	Satisfactory
1038FE	Zinnia	Rose.....	Good	Satisfactory
		S. S. Kresge Co., Springfield Laciniatus.....		
850F	Dianthus		Fair	Satisfactory 4 colors
		Thomas J. Grey Co., Boston, Mass. Opalcup Lavateroides (Lilac)...	Good	Satisfactory
707F	Anoda	Snowcup—Glistening White.....	Good	Satisfactory
708F	Anoda			
711F	Aster	Daisy Tahoka (Blue-Lavender, Golden Center).....	Poor	Not satisfactory
709F	Callistephus	Early California Giant Mixed...	Fair	Incomplete; had not bloomed October 4
710F	Cosmos	Giant Sensation Dazzler—Single Crimson.....	Fair	Satisfactory
712F	Dimorphotheca	(African Marguerite).....	Poor	Not satisfactory
714F	Petunia	Small Creamy White.....	Poor	Not satisfactory
713F	Tagetes	Dwarf Double French, Harmony Sunkist.....	Good	Satisfactory
716F	Verbena	Spitfire—Deep Scarlet Rose.....	Poor	Not satisfactory
715F	Viola	Blue Elf.....	Poor	Not satisfactory
717F	Zinnia	Cactus Flowered Giants, Mixed	Good	Satisfactory 6 colors
718F	Zinnia	Pumila Sunshine, Tints.....	Good	Satisfactory 7 colors
		Charles C. Hart Seed Co., Wethersfield, Conn. Davis Hardware Co., Gardner		
666F	Tropaeolum	Dwarf Mixed.....	Good	Satisfactory 5 colors
		Jeffway Hatch, Inc., Easthampton Hartwegii, Mixed.....		
855F	Lupinus		Fair	Incomplete; only 1 plant in bloom October 4
		Manchester-Forbes Co., Easthampton Baby's Breath, White.....		
861F	Gypsophila		Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
929F	Alyssum	Charles C. Hart Seed Co.—Con. Platt & Goslee, Great Barrington Saxatile—Basket of Gold	Poor	Not satisfactory 1 plant of Sweet Alyssum
932F	Gaillardia	F. H. Turner & Co., Hardware, Great Barrington Blanket Flower, Mixed Colors . . .	Fair	Incomplete; had not bloomed October 4 Satisfactory 5 colors
931F	Impatiens	Choice Double, Mixed Colors . . .	Good	
778F	Helichrysum	Waite Hardware Co., Worcester Everlasting Mixed	Good	Incomplete; had not bloomed October 4
777F	Impatiens	Choice Double, Mixed Colors . . .	Good	Satisfactory 6 colors
779F	Reseda	Giant Matchet Type	Poor	Not satisfactory
800F	Adonis	Budd D. Hawkins, Reading, Vt. Irving B. Barrows & Co., Worcester Autumnalis, Mixed	Poor	Not satisfactory
799F	Helichrysum	Everlasting or Strawflower	None	
607F	Celosia	Elwood Adams, Inc., Worcester Celosia, Fine Mixed Colors	Good	Satisfactory 6 colors
609F	Cosmos	Dawn, Mixed Colors	Poor	Not satisfactory
608F	Zinnia	Double Giant Red	Poor	Not satisfactory
171F	Papaver	Hygrade Seed Co., Fredonia, N. Y. Abraham Lincoln School, East Braintree American Legion	Poor	Not satisfactory
170F	Petunia	Exquisite Hybrida, Mixed	Poor	Not satisfactory
169F	Tagetes	Orbit	Good	Satisfactory
172F	Zinnia	California Giants, Mixed	Good	Satisfactory 5 colors
587F	Calendula	Little Tree Farms, Inc., Framingham Centre, Mass. Finest Dwarf Bedding Mixture	Fair	Satisfactory
586F	Callistephus	California Giant, Lt. Blue	Poor	Not satisfactory
978F	Ageratum	Mandeville & King Co., Rochester, N. Y. Berkshire Hardware Co., Pittsfield Blue Cap	Poor	Not satisfactory
880F	Centaurea	Bryan Hardware Co., Westfield Double Red Boy	Fair	Satisfactory
881F	Phlox	Drummond's Gigantea, Art Shades	Poor	Not satisfactory
1012F	Centaurea	The Hardware Shop, Adams Sweet Sultan, All Colors	Good	Incomplete; had not bloomed October 4
854F	Ageratum	Jeffway Hatch, Inc., Easthampton Floss Flower, Lavender Blue	Poor	Not satisfactory
726F	Delphinium	D. J. Mahoney, Haverhill Pink	Poor	Not satisfactory
727F	Tagetes	Golden West (Improved Guinea Gold)	Good	Incomplete; only 2 plants in bloom October 4
728F	Zinnia	Indian Summer (Mixture)	Good	Satisfactory 5 colors
986F	Antirrhinum	E. A. Noble & Co., Stockbridge Rust Proof, All Colors	Fair	Incomplete; had not bloomed October 4
954F	Mirabilis	Pittsfield Hardware & Plumbing Supply Co., Pittsfield Four O'Clocks, All Colors	Good	Satisfactory 4 colors
1078F	Iberis	J. B. Sibley & Son, Ware All Colors	Good	Satisfactory 5 colors
1079F	Linum	Scarlet	Good	Incomplete; had not bloomed October 4
1080F	Verbena	All Colors	Poor	Not satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
752F	Tropaeolum	Michael-Leonard Seed Co., Chicago, Ill. W. E. Aubuchon Co., Inc., Maynard Dwarf Mixed	Good	Satisfactory 4 colors
216F	Ageratum	New England Toro Co., West Newton, Mass. Blue Cap.	Poor	Not satisfactory
217F	Calendula	Orange King	Good	Satisfactory
215F	Callistephus	Giants of California, Mixed.	Good	Incomplete; had not bloomed October 4
218F	Zinnia	Giant Orange	Good	Satisfactory
1141F	Impatiens	Northrup, King & Co., Minneapolis, Minn. F. W. Woolworth Co., Brockton Balsam or Lady Slipper	Good	Satisfactory 5 colors
1142F	Lupinus	Annual Mixed	Good	Incomplete; only 2 plants in bloom October 4
1143F	Reseda	Sweet Scented Reseda odorata	Good	Satisfactory
935F	Cosmos	F. W. Woolworth Co., Great Barrington Early Large Flowering Mixed	Good	Satisfactory
936F	Eschscholtzia	Golden Orange	Good	Satisfactory
940F	Euphorbia	Snow on the Mountain	Good	Satisfactory
937F	Gypsophila	Annual Crimson Baby's Breath	Poor	Not satisfactory
939	Ipomoea	Scarlet O'Hara	Fair	Satisfactory
938F	Mirabilis	Marvel of Peru, Mixed Colors	Fair	Satisfactory 4 colors
806F	Alyssum	The Page Seed Co., Greene, N. Y. Community Grain Co., Worcester Sweet White	Good	Satisfactory
807F	Callistephus	Giant Comet Mixed	Good	Incomplete; had not bloomed October 4
805F	Didiscus	Blue Lace Flower	Fair	Incomplete; had not bloomed October 4
983F	Antirrhinum	Clifford Coal Co., Inc., Lenox Mixed Colors	Fair	Incomplete; had not bloomed October 4
984F	Dimorphotheca	Aurantiaca	Poor	Not satisfactory
985F	Papaver	Shirley, Mixed	Fair	Incomplete; had not bloomed October 4
916F	Alyssum	Dresser Hull Co., Lee Sweet White	Good	Satisfactory
917F	Celosia	Plumosa and Cristata Mixed	Good	Satisfactory 4 colors
132F	Calendula	Perry Seed Co., Boston, Mass. Perry's Orange King	Fair	Satisfactory
131F	Callistephus	Azure Blue, Wilt Resistant — Am. Branching	Good	Incomplete; had not bloomed October 4
134F	Centaurea	Double Blue Boy	Fair	Satisfactory
135F	Gypsophila	Elegans Grandiflora Alba	Good	Satisfactory
133F	Iberis	Giant White Perfection	Good	Satisfactory
136F	Tagetes	All Double African Lemon	Good	Incomplete; only 1 plant in bloom October 4
137F	Zinnia	New Giant Crested, Mixed Colors	Poor	Not satisfactory
532F	Petunia	Ralston Purina Co., St. Louis, Mo. Checkerboard Feed Store, Franklin Rosy Morn.	Fair	Satisfactory
531F	Tagetes	Crown of Gold	Good	Satisfactory
533F	Zinnia	Giants of California, Crimson	Good	Satisfactory
1089F	Dimorphotheca	Checkerboard Feed Store, Palmer African Mixed	Fair	Satisfactory
1090F	Mathiola	Ten Weeks, Mixed	Poor	Not satisfactory
1088F	Vinca	Madagascar Periwinkle, Mixed	Fair	Satisfactory 3 colors
659F	Alyssum	J. B. Rice, Jr., Inc., Shushan, N. Y. The Bengston Hardware Co., Gardner Sweet Little Gem, White	Poor	Not satisfactory
658F	Petunia	Annual Snow Queen	Poor	Not satisfactory
660F	Tagetes	Tall African, Double Mixed	Poor	Not satisfactory

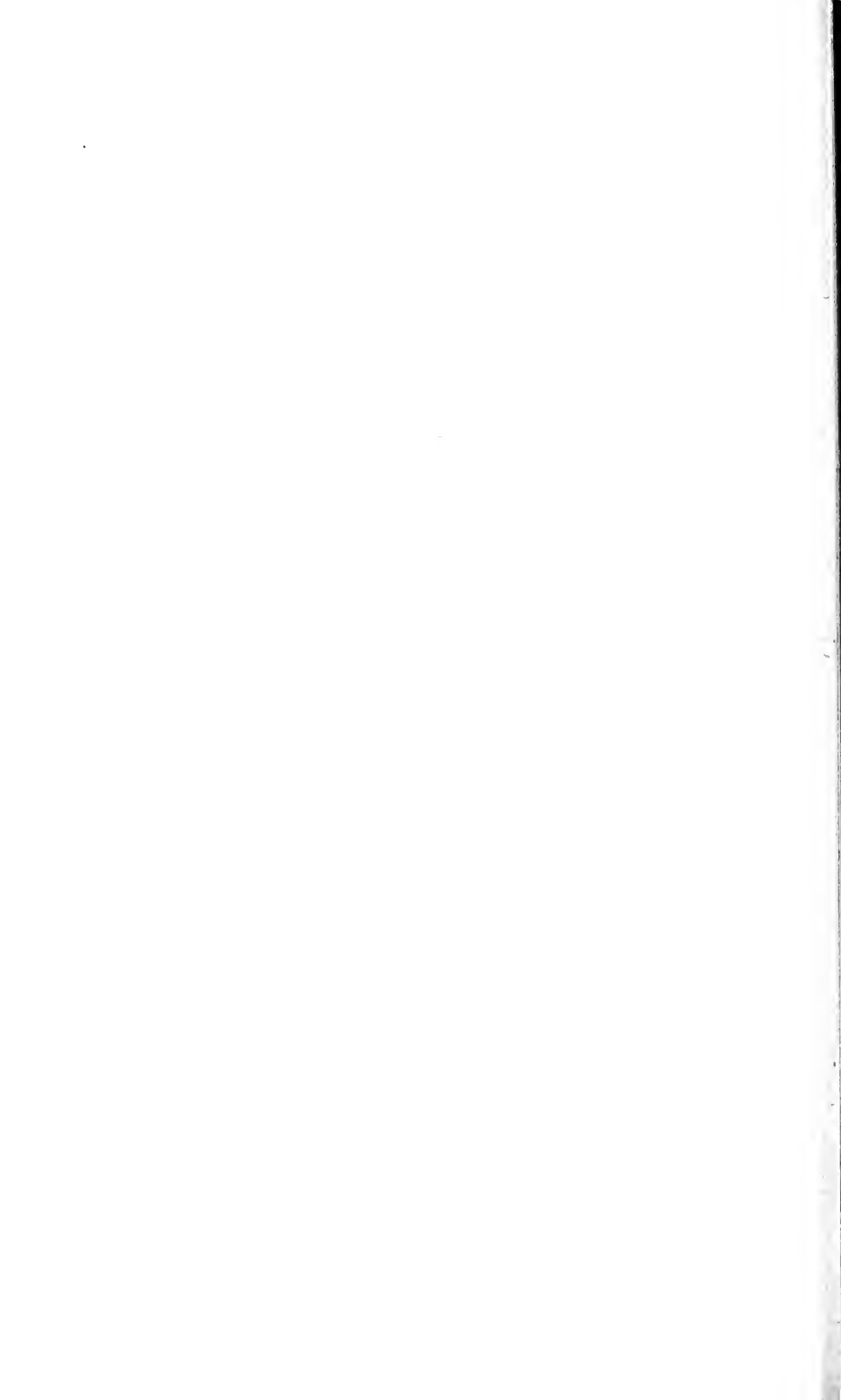
Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
969F	Chrysanthemum	J. B. Rice, Jr., Inc.—Con. Peirson Hardware Co., Pittsfield Tricolor Single Annual.....	Fair	Incomplete; had not bloomed October 4
974F	Dianthus	Marguerite Double Mixed.....	Poor	Not satisfactory
972F	Linum	Scarlet Flax, Annual.....	Poor	Not satisfactory
973F	Scabiosa	Mourning Bride, Mixed Annual.....	Poor	Not satisfactory
934F	Impatiens	F. H. Turner & Co., Hardware, Great Barrington Tall Double Mixed, Annual.....	Good	Satisfactory 5 colors
933F	Kochia	Mexican Fire Bush.....	Fair	Satisfactory
762F	Callistephus.....	Western Auto Association, Marlboro Heart of France.....	Good	Incomplete; had not bloomed October 4
1083F	Cosmos	Jerome B. Rice Seed Co., Cambridge, N. Y. Faulkner Hardware Co., Palmer Orange Flare.....	Good	Satisfactory
1084F	Cynoglossum	Annual.....	Good	Satisfactory
1085F	Euphorbia	Snow on the Mountain.....	Fair	Satisfactory
1070F	Mathiola	Double Dwarf Mixed.....	Fair	Incomplete; had not bloomed October 4
521F	Ageratum	Franklin Hardware & Plumbing Supply Co., Franklin Blue Perfection.....	Poor	Not satisfactory
522F	Centaurea	Jubilee Gem.....	Fair	Satisfactory
520F	Ipomoea	Heavenly Blue.....	Good	Satisfactory
856F	Ageratum	Jeffway Hatch, Inc., Easthampton Blue Perfection.....	Poor	Not satisfactory
950F	Iberis	Pittsfield Hardware & Plumbing Supply Co., Pittsfield Hyacinth Flowered.....	Good	Satisfactory
951F	Tagetes	Tagetes Signata Pumila.....	Fair	Satisfactory
1119F	Mathiola	Wadsworth Howland & Co., Boston Double Dwarf, Mixed.....	Fair	Incomplete; had not bloomed October 4
763F	Verbena	Western Auto Association, Marlboro Choice Mixed.....	Poor	Not satisfactory
781F	Calendula	Ross Bros. Co., Worcester, Mass. Chrysantha.....	Fair	Satisfactory
780F	Callistephus	Super Giant El Monte.....	Good	Incomplete; had not bloomed October 4
783F	Celosia	Glasgow Prize.....	Good	Satisfactory
782F	Centaurea.....	Double Blue Boy.....	Good	Incomplete; had not bloomed October 4
785F	Ipomoea	Heavenly Blue.....	Poor	Not satisfactory
784F	Tagetes	Guinea Gold.....	Good	Satisfactory
956F	Celosia	Sears, Roebuck & Co., Chicago, Ill. Sears, Roebuck & Co., Pittsfield Tall Feathered Mixed.....	Good	Satisfactory 8 colors
957F	Delphinium	Carmine King.....	Poor	Not satisfactory
955F	Dianthus	Giant Margaret, Mixed.....	Good	Incomplete; had not bloomed October 4
958F	Phlox	Drummond's grandiflora, Annual Mixed.....	Poor	Not satisfactory
959F	Salpiglossis	Painted Tongue, Mixed.....	None	
960F	Vinca	Mixed (Periwinkle).....	Fair	Satisfactory 3 colors
787F	Callistephus	Sears, Roebuck & Co., Worcester Giant Branching Pink.....	Good	Incomplete; had not bloomed October 4
788F	Centaurea	Double Mixed.....	Good	Satisfactory 3 colors
790F	Nemophila	Baby Blue Eyes.....	Poor	Not satisfactory
791F	Petunia	Balcony Blue (Purple).....	Good	Not satisfactory 4 colors
789F	Reseda	Sweet Matchet Mixed.....	Good	Satisfactory

Flower Seed Inspection Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests		
			Germination	Performance	
497F	Petunia	Sherwin-Williams Co., Waltham, Mass. Dwarf, Small Flowering, Special Mixture Treasure Chest	Poor	Not satisfactory Incomplete; only 1 plant in bloom October 4	
496F	Tagetes		Good		
495F	Zinnia		Giant Curly	Good	Satisfactory 4 colors
887F	Cosmidium	Sterling Seed Co., Minneapolis, Minn. M. N. Landau, Inc., Westfield Orange, Yellow Brown Double Mixed Pinks All Colors Mixed	Good	Satisfactory	
889F	Dianthus		Good	Satisfactory 6 colors	
888F	Iberis		Fair	Satisfactory 4 colors	
551F	Centaurea	Stump & Walter Co., New York, N.Y. Hamlin's Service Station, Norwood Double Blue Boy Improved Rosy Morn Guinea Gold	Good	Satisfactory	
553F	Petunia		Fair	Satisfactory	
552F	Tagetes		Good	Incomplete; had not bloomed October 4	
832F	Callistephus	The Templin Bradley Co., Cleveland, Ohio* Amity Street School, Amherst Extra Quality Mixed Eschscholtzia All Colors Mixed Mourning Bride Elegans—Youth and Old Age	Fair	Satisfactory	
833F	Eschscholtzia		Good	Satisfactory	
834F	Iberis		Poor	Not satisfactory	
835F	Scabiosa		Poor	Not satisfactory	
836F	Zinnia		Good	Satisfactory 6 colors	
1095F	Cynoglossum	Vaughan's Seed Store, New York, N. Y. Palmer Flower Shop, Palmer Firmanent (Chinese Forget-me-not)	Poor	Not satisfactory	
1092F	Delphinium		Vaughan's Special Annual Mixture	Poor	Not satisfactory
1091F	Mirabilis	Marvel of Peru, Mixed Double Scarlet Gleam Dahlia-Flowered, Mixed	Good	Satisfactory 6 colors	
1093F	Tropaeolum		Fair	Satisfactory	
1094F	Zinnia		Good	Satisfactory	
907FA	Callistephus	James Vicks Seeds, Philadelphia, Pa. Ben Franklin Store, Lee Blackish Blue	Good	Incomplete; had not bloomed October 4 Incomplete; had not bloomed October 4	
907FB	Callistephus		White		Fair
907FC	Callistephus		Scarlet-Rose		None
1077F	Tropaeolum	F. H. Woodruff & Sons, Milford, Conn. J. B. Sibley & Son, Ware Golden Gleam	Poor	Not satisfactory	

*School Department of this Company better known as Children's Flower Mission.



MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

Control Series

Bulletin No. 120

July 1944

**Twenty-fourth Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

Pullorum disease eradication is an essential and vital part of a profitable poultry industry. The season of 1943-44 established a new record for volume of testing and showed a decided decrease in the amount of infection found. So long as infected flocks are found, however, there should be no relaxation of the eradication program.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

TWENTY-FOURTH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1943-1944

By the Poultry Disease Control Laboratory¹

Introduction

During the 1943-44 season a marked interest was shown in pullorum testing. This is largely attributed to the increased demand for poultry meat and eggs which must be supplied either directly or indirectly by the breeding flocks. With the expansion of the poultry industry through additional and larger flocks, the educational work has exerted a beneficial influence in helping to establish pullorum-free flocks. When the poultry industry readjusts itself to normal conditions, it is hoped that flock owners will continue to realize that a profitable industry can be maintained only with healthy stock. It should be recognized further that the development of pullorum disease-free stock is not an "overnight" accomplishment; and therefore, once a disease-free flock is established every effort should be made to maintain it in that condition over a period of years. It is hoped that the progress in reducing the percentage of infection during the twenty-four year period from 12.5 to 0.11 percent may continue. This will require the cooperative effort of all agencies interested in the poultry industry, including the individual flock owner. Pullorum disease eradication is an essential and vital part of a profitable industry.

During the past season the task of meeting the large volume of testing was not easy. Laboratory facilities and personnel have been under a great strain. The flock owners also experienced difficulties in procuring help to assist with the collecting of the blood samples. In spite of these handicaps very few flock owners have had their testing delayed. Appreciation is extended to the flock owners for the fine cooperation given.

Summary of Service Rendered

Applications received.....	474
Applications cancelled.....	12
Flocks tested.....	462
Chicken flocks.....	403
Chicken and turkey flocks.....	10
Turkey flocks.....	49
Number of tests.....	808,845
Chickens:	
Routine.....	788,989
Experimental.....	2,607
Fowl other than chickens:	
Routine.....	13,186
Experimental.....	4,063
Owners receiving necropsy service.....	17*
Necropsies of reacting birds.....	53**

*Includes 2 turkey flocks

**Includes 3 turkeys

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Chief of Laboratory; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; Miriam K. Clarke, Research Assistant; Felicia Jewett, Laboratory Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

TABLE 1. DISTRIBUTION OF TESTS AND REACTORS BY COUNTIES AND BREEDS

Breeds	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Percent Positive Tests
(Total tests)	3,984	7,183	84,904	499	64,883	25,094	20,450	34,746	111,145	51,565	42,815	113,320	560,588	
(Positive tests)	0	0	104	0	0	22	70	35	256	1	55	114	657	0.12
(Total tests)	711	1,823	22,732	3,196	8,701	19,670	2,257	8,970	17,517	9,496	18,143	26,519	139,735	
(Positive tests)	0	0	4	4	25	40	0	1	56	0	5	26	161	0.12
(Total tests)			51		2,650		667	1,625	7,325	1,579	10,857	20	24,774	
(Positive tests)			0		0		0	0	15	0	0	0	15	0.06
(Total tests)		4,242	280		4,518					1			9,041	
(Positive tests)		0	0		0					0			0	0.00
(Total tests)			6,325		9,724	2,996	1,690	365	5,909	545	21,129	1,387	50,070	
(Positive tests)			6		1	0	0	0	0	0	4	21	32	0.06
(Total tests)	310	331	971		804	5	464	20	116	2,938	381	1,048	7,388	
(Positive tests)	0	0	0		0	0	1	1	0	0	4	0	6	0.08
Total Tests	5,005	13,579	115,263	3,695	91,280	47,765	25,528	45,726	142,012	66,124	93,325	142,294	791,596	
Positive Tests	0	0	114	4	26	62	71	37	327	1	68	161	871	
(Percent)	0.00	0.00	0.10	0.11	0.03	0.13	0.28	0.08	0.23	0.002	0.07	0.11	0.11	

Distribution of Tests and Reactors

Table 1 gives the distribution of tests and reactors by counties. A total of 791,596 chicken samples from 12 counties was submitted. Of this number, 871, or 0.11 percent, were detected as reactors. The percentages of positive tests for the various counties were very low, the highest being only 0.28 percent. Samples from two counties, Barnstable and Berkshire, revealed no reactors. Worcester, Middlesex, and Bristol Counties led in the number of samples tested.

The following breeds and varieties were tested: Bantam, Barnevelders, Barred Plymouth Rock, Black Langshan, Brahma, Buff Orpington, Columbian Plymouth Rock, Crosses, Jersey White Giant, New Hampshire, Rhode Island Red, Silver Laced Wyandotte, White American, White Cornish, White Leghorn, White Plymouth Rock, and White Wyandotte. Reactors were detected among Barred Plymouth Rocks, New Hampshires, Rhode Island Reds, White Plymouth Rocks, and Crosses.

Of the total number of samples tested, 716,421 were collected from females (73,476 hens and 642,945 pullets) and 75,175 from males. The percentages of reactors were .09 among the hens, .12 among the pullets, and .041 among the males.

Annual Testing of Flocks

Table 2 shows the results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years.

TABLE 2.—ANNUAL TESTING VERSUS SINGLE AND INTERMITTENT TESTING

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially tested	100% tested	Partially Tested
Flocks tested —									
For the first time.....	94	99,346	101,766	320	0.31	68	13	8	5
Intermittently.....	30	43,734	43,734	207	0.47	24	3	2	1
Two consecutive years.....	33	43,237	44,560	71	0.16	29	2	2	0
Three or more consecutive years	256	575,749	601,536	273	0.05	233	14	6	3
Totals.....	413	762,066	791,596	871	0.11	354	32	18	9

In the group tested for the first time, the number of flocks and tests increased considerably over those of the previous season. A total of 94 flocks was tested, representing 101,766 tests of which 0.31 percent were positive. There were 81 non-reacting flocks, representing 89,125 birds, and 13 positive flocks, representing 10,151 birds. Special attention is called to the low percentage of positive tests, which indicates that new flocks can be established from pullorum-free sources.

The intermittent group also showed a considerable increase over the previous season, 30 flocks, representing 43,734 samples, being tested. The percentage of positive tests was 0.47. Twenty-seven non-reacting flocks, representing 41,135 birds, were identified in this group.

In the group tested for two consecutive years, the number of flocks and tests was markedly smaller than in the previous season. The flocks numbered 33, representing 44,560 tests of which 0.16 percent were positive. Thirty-one non-reacting flocks, representing 41,651 birds, were identified.

The group tested for three or more consecutive years showed a definite increase over the previous season, 256 flocks, representing 601,536 samples, being tested. The percentage of positive tests was only 0.05. A total of 247 non-reacting flocks, containing 549,248 birds, was detected.

Considering the four groups as a whole, 413 flocks were tested, representing 762,066 birds and 791,596 samples, of which only 0.11 percent were found to be positive. The 354 flocks which were 100 percent tested and non-reacting contained 692,556 birds, or 90.8 percent of all birds tested. These results are indeed encouraging, because the larger the number of birds in 100 percent non-reacting flocks, the more rapid will be the progress in establishing additional pullorum-free flocks. Massachusetts flock owners should have ample opportunity to buy good stock which is free of pullorum disease.

The number of positive flocks was 27, representing 40,837 birds. Although this is a slight increase over the previous season, it is not significant when one considers the over-all increase in the total number of birds tested. It is hoped that these infected flocks will be disposed of and replaced with pullorum-free stock this year.

The results indicate that flocks which are tested annually show a lower incidence of reactors than do flocks tested for the first time or intermittently. Annual testing is the only way to determine the pullorum status of a breeding flock. Failure to recognize this fact may lead one into considerable difficulty.

Appearance of Infection in Flocks Previously Negative

The matter of maintaining a flock free from pullorum disease is of great concern to the flock owner and the testing agency. Progress in eradication can not be expected if infection reappears as fast as it is eliminated from flocks. As long as free stock is exposed to pullorum infection, so-called "breaks" may be expected to occur.

Table 3 gives the testing results for flocks which had been non-reacting for one or more years, but showed infection in 1943-44. Seventeen "breaks" are listed, which is four more than occurred the previous year. In four cases the amount of infection exceeded 1 percent. Two flocks had been negative for one year, three for two years, three for four years, two for five years, one each for seven and eight years, two for nine years, and one each for ten, eleven, and fourteen years.

In nine cases the explanation for the "breaks" was unknown, in two the infection was introduced from an infected supply flock, in three through the purchase of questionable stock, in one possibly through inadequate preventive measures, in one through contest birds, and in one no information was obtained.

In ten flocks a negative test was obtained through intensive retesting. In six flocks no retesting was carried out by the flock owner.

The appearance of pullorum infection in a flock previously negative may be a very serious problem, especially in the larger breeding flocks and if the infection is detected late in the season. The majority of flock owners have no conception of the difficulties that may follow a "break" in a pullorum-free testing record. When infection is detected, at least four weeks are required before the next test can be applied. If the eggs from the flock are used for local hatching or sold to

TABLE 3.—APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

1943-44 Season					
Flock	Number of Years Negative	Flock Total	Number Tested	Positive Tests Percent	Explanation for Infection
1	1	414	414	0.24	Unknown
2	4	2,627	2,624	0.15	Unknown
3	10	707	706	2.97	Infected supply flock
		432	432*	0.00	
4	2	1,564	1,564	0.83	Inadequate preventive measures
		1,420	1,420*	0.14	
		1,717	1,717*	0.00	
5	4	706	705	1.13	Unknown
6	9	1,166	1,165	0.26	Infected supply flock
		1,153	1,153*	0.00	
7	2	1,062	1,060	3.02	Purchase of questionable stock
8	8	8,904	8,901	0.06	Unknown
9	14	1,086	1,086	0.28	Unknown
		1,001	1,001*	1.70	
			45*	0.00	
		831	831*	0.00	
10	2	2,685	2,635	0.27	Unknown
		2,635	135*	0.00	
11	4	1,871	1,859	0.22	Purchase of questionable stock
		1,836	1,836*	0.00	
12	1	9,283	3,182	0.06	No information
13	9	8,163	8,161	0.01	Unknown
		6,713	4,382*	0.07	
14	7	538	538	0.19	Unknown
		533	532*	0.00	
15	11	7,729	7,727	0.01	Contest birds
		7,000	908*	0.00	
16	5	1,195	1,195	0.17	Unknown
		1,168	1,168*	0.00	
17	5	5,055	5,055	0.20	Purchase of questionable stock
		4,767	4,767*	0.02	
		4,745	804*	0.00	

*Represents retests

a commercial hatchery and infection is detected in the breeding flock, the supplying of hatching eggs is immediately discontinued, according to official regulations. No flock known to be infected should supply hatching eggs or chicks. If "breaks" are to be prevented or kept at a low level, every breeder should exercise the greatest vigilance in keeping out infection that may enter through the many possible channels. The following measures should be put into practice by flock owners if they expect to establish and maintain pullorum-free flocks.

1. All the birds on the premises should be tested each year.

2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.

3. Every reactor, regardless of its value, should be removed from the premises for slaughter immediately upon receipt of the report.

4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.

5. The poultry houses, runs, and equipment, should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.

6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum-disease-free flocks. Consult your county agent regarding additions or replacements in your flock.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum-disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

Testing of Fowl Other Than Chickens

A total of 17,249 samples collected from fowl other than chickens was tested during the past year. Turkey samples numbered 17,224, among which were 1.56 percent reactors. The infection was confined to three out of the 59 flocks. These three flocks were retested and further reactors were detected. The percentage of reactors detected among the retests was 1.68. One large infected flock was retested, which accounts for a higher percentage of reactors among the retests than among the total tests.

The response of infected turkey flocks to retesting is different from that usually observed among chickens. Many doubtful reactions are encountered in infected turkey flocks which appear infrequently or not at all in non-infected flocks. However, pullorum infection in turkey breeding flocks can be controlled and eliminated through retesting, although more retests may be required than in the case of chickens.

Turkey breeders should recognize the necessity of exercising every precaution in establishing and maintaining pullorum-free flocks. Some owners resort to the whole blood test for determining the pullorum status of a flock. Laboratory and field evidence to date has shown that the whole blood test is not reliable in the testing of turkeys for pullorum disease.

Some turkey breeders and hatcherymen take little or no precaution against custom hatching. It has been definitely established that pullorum infection can be transmitted in the incubator even though only turkey eggs are hatched in the incubator. Hatcherymen should not accept eggs from breeding flocks that have not been tested or are known to be infected.

Before new stock is introduced, a very careful check should be made with the official state agency as to the pullorum status of the flock. Only stock from officially recognized pullorum-free flocks should be introduced.

Some turkey flock owners also maintain chickens on the premises. In such instances it is highly important that the chickens, as well as the turkeys, be pullorum-free.

During the past year 25 samples from ducks, geese, guinea fowl, and pheasants were tested with no reactors.

TABLE 4.—NONREACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable	2	3,807	1	1,198	3	5,005
Berkshire	8	13,579	—	—	8	13,579
Bristol	45	94,340	8	5,133	53	99,473
Dukes	1	1,859	—	—	1	1,859
Essex	43	85,708	6	4,577	49	90,285
Franklin	23	41,230	1	2,648	24	43,878
Hampden	20	22,474	1	827	21	23,301
Hampshire	29	36,896	3	2,146	32	39,042
Middlesex	55	119,170	5	3,968	60	123,138
Norfolk	28	60,986	3	5,044	31	66,030
Plymouth	34	79,819	2	2,367	36	82,186
Worcester	66	132,688	2	765	68	133,453
Totals	354	692,556	32	28,673	386	721,229
Positive Flocks						
Bristol	1	8,161	1	607	2	8,768
Essex	1	414	1	493	2	907
Franklin	3	3,069	—	—	3	3,069
Hampden	2	1,096	1	220	3	1,316
Hampshire	—	—	1	17	1	17
Middlesex	7	16,324	3	2,415	10	18,739
Norfolk	1	43	—	—	1	43
Plymouth	1	2,624	1	2,715	2	5,339
Worcester	2	2,106	1	533	3	2,639
Totals	18	33,837	9	7,000	27	40,837

Non-Reacting and Positive Flocks Classified by Counties

In Table 4 is given the distribution of non-reacting and positive flocks by counties. In the twelve counties in which testing was done, 354 non-reacting flocks (100 percent tested), representing 692,556 birds, were detected; and 32

partially tested non-reacting flocks, representing 28,673 birds, were detected in ten counties. The flocks tested in Berkshire and Dukes counties were all 100 percent tested and free of infection. Worcester, Middlesex, and Bristol counties had the largest number of flocks and birds in the non-reacting group.

In ten counties, 27 flocks, representing 40,837 birds, gave positive tests. Of these 27 flocks, 18 were 100 percent and 9 partially tested. Middlesex County had 10 positive flocks; none of the other nine counties had more than three.

These results show that, while Massachusetts has a considerable supply of pullorum-free stock, it also has more infected flocks than one would expect after 24 years of testing. Of the 413 flocks tested, 6.5 percent, containing 5.2 percent of the birds tested, were classified as infected at the end of the season.

A more concerted effort should be made, particularly on the part of flock owners, to eliminate the infection from their premises. After a clean flock has been established, every precaution should be taken against reinfection. With the amount of pullorum-free stock existing in Massachusetts today, it should be possible for any poultryman to have nothing but pullorum-free stock on his premises.

TABLE 5.—COMPARISON OF 1942-43 AND 1943-44 TESTING

County	Flocks	Birds	Tests	Positive Tests Percent	Non-Reacting Flocks
1942-43 Season					
Barnstable.....	2	3,764	3,764	0.00	2
Berkshire.....	7	11,552	13,873	1.44	6
Bristol.....	48	93,356	95,744	0.08	45
Dukes.....	1	2,239	2,239	0.00	1
Essex.....	48	81,252	81,252	0.02	47
Franklin.....	26	44,575	46,704	0.03	26
Hampden.....	20	20,466	20,466	0.00	20
Hampshire.....	25	29,107	29,246	0.02	23
Middlesex.....	46	97,297	100,075	0.01	43
Norfolk.....	25	70,178	71,890	1.64	23
Plymouth.....	30	70,495	70,499	0.35	29
Worcester.....	54	113,385	113,385	1.20	52
Totals.....	332	637,666	649,137	0.48	317
1943-44 Season					
Barnstable.....	3	5,005	5,005	0.00	3
Berkshire.....	8	13,579	13,579	0.00	8
Bristol.....	55	108,241	115,263	0.10	53
Dukes.....	1	1,859	3,695	0.11	1
Essex.....	51	91,192	91,280	0.03	49
Franklin.....	27	46,947	47,765	0.13	24
Hampden.....	24	24,617	25,528	0.28	21
Hampshire.....	33	39,059	45,726	0.08	32
Middlesex.....	70	141,877	142,012	0.23	60
Norfolk.....	32	66,073	66,124	0.002	31
Plymouth.....	38	87,525	93,325	0.07	36
Worcester.....	71	136,092	142,294	0.11	68
Totals.....	413	762,066	791,596	0.11	386

Comparison of 1942-43 and 1943-44 Testing

Table 5 gives the comparison of the 1942-43 and 1943-44 testing results for the different counties. An increase in the number of flocks was observed in all but one county, Dukes; an increase in tested birds in all but two counties, Dukes and Norfolk; and an increase in non-reacting flocks in all counties but Dukes and Franklin.

For all counties combined, significant increases were observed as follows:

	1942-43	1943-44	Increase
Tested flocks.....	332	413	81
Tested birds.....	637,666	762,066	124,400
Tests.....	649,137	791,596	142,459
Non-reacting flocks.....	317	386	69
100 percent tested, non-reacting flocks.....	295	354	59
Birds in 100 percent tested, non-reacting flocks .	583,733	692,556	108,823
Infected flocks.....	15	27	12
"Breaks".....	13	17	4

The average percentage of reactors was reduced from 0.48 to 0.11. Of the total birds tested, 90.8 percent were in 100 percent tested non-reacting flocks. Sixty flocks tested in 1942-43 were not tested in 1943-44.

These results show that the volume of work has increased tremendously during the past year. The laboratory, however, has put forth every effort to meet the requests for testing, and few flock owners have had their testing delayed at the request of the laboratory. If those owners whose flocks could be tested during late summer or early fall would notify the laboratory, it would help to relieve the testing load during November, December, and January, thus enabling the laboratory to carry on the work with less temporary help, which is difficult or impossible to obtain.

Twenty-Four-Year Testing Summary

Table 6 gives the testing results for a 24-year testing period. Progress in the establishment and maintenance of pullorum-free flocks is still evident. It is hoped that this trend may continue and that the disease will be eliminated further from poultry flocks in Massachusetts.

Comments and Suggestions

Annual Testing: The majority of poultrymen recognize the importance of annual testing of flocks for pullorum disease. Testing results show that flocks are more apt to harbor infection if flock owners do not follow an annual testing program. Sixty, or 18 percent, of the 332 flocks tested in 1942-43 were not subjected to test in 1943-44. This past year the intermittently tested group of flocks was the highest of the four groups in percentage of infection. Progress in the elimination of the disease would be more rapid if flock owners would follow an annual testing program. It must be recognized that a certain percentage of flocks drop out from year to year for reasons such as discontinuance of the poultry business or change in type of management. On the other hand, there are certain flock owners who continue in breeding operations without subjecting their flocks to annual testing. Such a practice prevents their flocks from being officially recognized by the official state agency, as well as hindering the establishment and maintenance of pullorum-free flocks.

TABLE 6.—TWENTY-FOUR-YEAR PULLORUM DISEASE TESTING SUMMARY

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,773	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

Testing All Birds on Premises: This past year 41 flock owners (9.92 percent) had only part of their flocks tested, compared with 7.53 percent the previous season. While no reactors were found in the majority of these partially tested flocks, they were not eligible for official recognition because it is impossible to determine the true pullorum status of all birds on the premises by testing only part of the flock. Flock owners, therefore, should strive to test their entire flock if any testing is to be done. This would enable them to determine the true status of the flocks, permit official recognition of the flocks if negative, and without question increase the sales possibilities of their stock.

Early Testing: During the last three years the laboratory has had increasing difficulty in finding temporary help to assist with the field and laboratory work. It is exceedingly difficult to interest competent persons in short-term employment. The bulk of the testing work comes in October, November, December, and January. The following summary will point out the situation more clearly.

Month	Tests	Month	Tests
April, 1943	4,159	October	123,161
May	5,273	November	157,296
June	1,487	December	139,577
July	6,345	January, 1944	129,963
August	24,004	February	90,600
September	57,452	March	69,528

Flock owners who are in a position to test part or all of their flocks before October, can help to relieve the testing load during the peak months. Split-flock testing is not recommended ordinarily because of the danger that untested birds may find their way into pens of tested birds. However, if the plant is so arranged and managed that this danger can be eliminated, it should be safe to test parts of the flock as they become eligible for the test. For official recognition birds should not be tested before five months of age. It is hoped that flock owners who are in position to test early will cooperate with the laboratory and test whatever birds can be safely tested. Early testing is especially indicated if infection is expected in the flock so that plans for eliminating the disease can be made ahead of the hatching season.

Prevention of Pullorum Infection: The identification of pullorum infection in stock from supposedly free sources has caused much concern this past year. It is apparent that there has been an increase in the spread of the disease this past year. The sources of infection are the same as we have always recognized; but the flock owner, hatcheryman, feed man, etc., have had too heavy a load to carry without getting into difficulty. Some of the fundamental disease prevention principles have had to be neglected or ignored with the result that infection was permitted to spread. It is appreciated that labor difficulties, scarcities of material and equipment, etc., have contributed to inadequate or faulty management which in turn has led to the introduction of infection. It is hoped that all agencies concerned with raising poultry will make an honest effort to help avoid the introduction of the disease.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 121

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**Inspection of Commercial
Feedstuffs**

By Feed Control Service Staff

This, the fiftieth report of feeding stuffs inspection, contains in addition to information required by statute other data pertaining to the nutritive value of feedstuffs. The protein quality index of meat and fish products; the calcium, phosphorus, manganese, choline and riboflavin content of commercial feedstuffs; and the carotene content of alfalfa products are also included.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith¹

With this bulletin Control Service resumes the practice of publishing the results of the feed analyses discontinued two years ago. At that time it was believed that, because of the frequent changes in ration ingredients made necessary by shortages and Federal regulation, the analyses could be of little value in helping the customer to decide on the relative value of feeds which might be sold at a later date under revised and radically modified formulas.

In retrospect it may be well to consider how well feed manufacturers have been able to meet this unusual situation. Conformance to a guarantee of analysis is to some extent a measure of the reliability of those who are responsible for it. On the whole guarantees have been well maintained except for fat. Whether or not the general lowering of the fat content of feeds affects their nutritive value is debatable. However, a statement of minimum fat content is required by statute and in many instances manufacturers would do well to lower fat guarantees to meet the enforced use of ingredients which do not carry a high fat percentage. The restricted use of meat scrap, oil cakes and other high fat material and the increased use of wheat meal account for this condition, particularly as applied to poultry feeds.

Up to the present animals and poultry have received a sufficient grain ration to satisfy body requirements. Whether or not it has always been of the sort to insure maximum production may be questioned. Production records indicate that grain rations have been both ample and of good quality even though differing somewhat from accepted standards.

The greater problem has been and will continue to be not so much a matter of protein, fat, and fiber as the furnishing of the more obscure elements of the ration, such as the essential vitamins and mineral elements. Regulations thus far adopted have had this in mind.

As a contribution to a general knowledge of commercial rations and ration ingredients, particularly as applied to poultry feeds, considerable work has been done which lies outside the scope of the feeding stuffs act. The results form a part of this publication. No attempt is made to draw conclusions as to the application of these data—a function which belongs more properly to the feeding expert.

In the following tables of the analyses of commercial feeds, wherever the brand name is in whole or a part of the firm name, the brand name has been omitted. This for the sake of brevity and simplification in printing. In every case identification is complete without it.

¹The following staff members assisted in the inspection: John W. Kuzmeski, Albert F. Spelman, Leo V. Crowley, C. Tyson Smith, and Henry T. Rodman, chemists; Frederick A. McLaughlin, microscopist; James T. Howard, inspector; Joseph A. Martell, laboratory assistant; Cora B. Grover, clerk.

Complete Average Analyses of Commercial Feeds Collected (Percent)

Number of Analyses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitrogen Free Extract		Fiber		Ash
			Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Allied Mills, Inc.											
1	Economy 16% Dairy Feed	10.5	19.3	16.0	3.1	3.0	53.8	5.8	9.0	7.5	
1	Economy Layer Mash	12.1	18.4	18.0	3.1	3.5	55.0	3.7	8.0	5.8	
2	Wayne All Mash Egg	11.2	16.4	15.0	2.8	3.5	57.8	5.8	8.0	6.0	
4	Wayne Brooder Mash	11.5	20.7	20.0	3.7	3.5	51.0	6.2	8.0	6.7	
2	Wayne Chick and Broiler Ration	10.4	20.3	19.0	3.7	3.5	52.5	6.4	8.0	6.7	
1	Wayne Chick and Broiler Ration	12.8	19.2	19.0	3.6	3.0	51.4	6.5	8.0	6.5	
1	Wayne Chick Starter	13.0	18.0	18.0	4.0	3.0	53.7	5.6	7.0	5.7	
1	Wayne Complete Calf Feed	10.7	18.8	16.0	3.6	3.3	52.3	7.8	9.0	6.8	
6	Wayne 18% Dairy Feed	11.4	20.2	18.0	3.6	3.5	52.0	6.4	10.0	6.4	
3	Wayne Egg Mash	12.2	20.5	20.0	3.2	3.5	51.4	5.6	8.0	7.1	
1	Wayne Egg Mash	12.4	21.4	20.0	3.8	3.0	49.9	5.8	8.0	6.7	
3	Wayne Fitting Ration	11.5	16.4	12.0	3.1	3.5	55.6	6.8	8.0	6.3	
2	Wayne Flushing Mash	10.8	20.8	20.0	3.5	3.0	53.6	3.4	9.0	7.9	
2	Wayne Growing Mash	11.5	18.2	16.0	3.1	3.5	56.1	5.4	7.0	5.7	
1	Wayne Growing Mash	12.7	17.3	16.0	3.3	3.0	56.5	4.8	7.0	5.4	
1	Wayne Horse Feed	12.1	12.9	9.5	2.9	2.5	61.2	8.0	10.0	2.9	
3	Wayne 16% Dairy Feed	11.3	18.1	16.0	3.6	3.5	53.2	7.2	9.0	6.6	
1	Wayne Turkey Growing Mash	11.8	19.5	20.0	3.3	3.5	52.9	5.2	8.0	7.3	
A. P. Ames & Co.											
1	Complete Cycle Ration	11.8	18.2	16.0	3.0	4.0	57.2	5.3	6.0	4.5	
1	Egg Mash	11.0	21.9	20.0	4.2	4.0	46.8	5.0	7.0	8.1	
1	18% Milk Maker	11.0	20.9	18.0	2.6	4.0	55.1	4.4	10.0	5.7	
1	Starter & Broiler	11.0	21.0	19.5	3.7	4.0	54.1	4.2	7.0	6.0	
Arady Farms Milling Co.											
1	Egg & Brooder Mash	11.0	23.4	20.0	2.7	3.5	49.2	6.1	8.0	7.0	
1	18% Dairy Feed	11.0	19.2	18.0	3.6	3.0	47.3	9.9	12.0	9.0	
1	Hog Grower	10.2	15.3	15.0	4.2	3.5	55.3	8.7	9.0	6.3	
2	Wonderfat Station Feed with Rolled Oats	11.2	14.4	15.0	3.7	4.5	59.5	6.3	7.0	4.9	

Complete Average Analyses of Commercial Feeds Collected (Percent)—Continued

Number of Analyses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
			Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
E. W. Bailey & Co.										
1	Pennant Brand Breeder Mash	10.9	21.0	20.0	4.2	3.5	51.9	4.5	7.0	7.5
2	Pennant Brand Calf Ration	12.4	16.5	15.0	3.9	3.7	54.3	0.5	8.5	6.4
1	Pennant Brand Growing Mash	11.5	19.3	18.0	3.2	3.5	56.1	3.9	7.0	6.0
1	Pennant Brand Laying Mash	11.7	21.0	20.0	3.3	3.5	52.6	4.5	7.0	7.2
1	Pennant Brand Laying Pellets	11.5	20.2	16.0	3.2	3.5	52.0	5.4	7.0	6.9
1	Pennant Brand Pig Feed	10.9	17.8	16.0	3.3	3.5	56.5	4.7	7.0	6.8
1	Pennant Brand 16% Dairy Ration	11.9	16.6	17.0	3.1	3.5	59.0	4.0	8.0	5.4
1	Pennant Brand Turkey Fattener	11.1	19.5	18.0	2.4	3.5	56.0	3.5	6.0	7.5
1	Pennant Brand Turkey Starter	11.1	25.9	25.0	4.5	3.5	46.0	4.4	0.5	8.1
Barber & Bennett, Inc.										
1	B & B Laying Mash	12.7	17.9	18.0	4.1	4.0	54.2	4.5	7.0	6.6
1	Fort Orange Breeder Mash	12.9	18.9	19.0	3.1	4.0	50.8	5.4	7.0	8.9
2	Fort Orange Broiler Mash	12.3	18.0	18.0	3.8	4.0	54.7	4.9	7.0	6.3
2	Fort Orange Golden Test Ration	12.3	18.4	18.0	4.2	4.5	52.0	8.1	8.5	5.0
2	Fort Orange Growing Mash	12.4	17.6	17.5	3.4	4.0	55.2	4.9	7.0	6.5
2	Fort Orange Laying Mash	11.7	19.2	19.0	3.4	4.0	51.9	5.0	7.0	8.8
2	Fort Orange Pig and Hog Feed	12.7	15.1	15.0	3.1	3.5	58.9	4.6	6.5	5.6
2	Fort Orange 12% Fitting and Calf Ration	12.7	14.2	12.0	3.7	4.0	57.3	5.9	8.5	6.2
Beacon Milling Co., Inc.										
2	Auburn "16"	11.4	18.4	16.0	3.6	3.25	52.3	7.5	10.0	6.8
2	Battery Laying Mash	10.7	17.2	16.0	3.9	3.5	54.7	6.2	7.75	6.8
1	Be-Co-Lass	14.1	11.0	11.0	2.8	1.0	50.6	13.3	16.0	7.3
2	Breeders Mash	10.0	20.0	20.0	5.0	3.5	48.8	6.0	7.5	9.1
2	Calf Grain	12.0	15.2	14.0	3.8	3.0	54.6	7.8	10.0	6.8
1	Cayuga Horse Feed	12.7	13.5	10.0	2.6	2.5	58.6	7.8	9.0	5.2
1	C-C Pellets	10.8	18.1	18.0	7.0	1.0	54.7	4.1	5.0	5.3
1	Complete Starting Ration	10.1	22.7	20.0	4.9	3.5	50.9	4.5	6.5	6.9
2	Complete Starting Ration	11.4	21.5	20.0	4.1	3.0	51.2	5.1	6.5	6.7
1	Egg Mash	10.7	21.9	20.0	4.5	3.5	48.8	5.3	7.5	8.8
1	Eggs Mash	11.1	19.6	20.0	4.5	3.0	49.0	6.4	7.5	9.4
3	Emergency Cow Test Ration	12.4	16.0	16.0	4.4	4.0	51.2	7.6	9.0	6.2
2	Fitting Ration	12.5	15.8	14.0	3.4	3.75	54.3	6.8	8.0	7.2
2	Fitting Ration	13.2	15.1	14.0	2.9	3.5	54.9	6.7	8.0	7.2
1	Fleshing Pellets	10.1	19.1	17.0	3.1	3.25	53.2	6.4	7.5	8.1
1	Fleshing Pellets	12.4	18.6	17.0	3.6	3.0	50.9	5.8	7.5	8.7
1	Growing Mash	10.3	18.9	18.0	4.3	3.5	53.4	5.6	7.5	7.5
3	Special "18"	12.5	19.5	18.0	3.7	3.5	51.4	6.8	9.0	6.1

1	Borden Grain Co. Laying Mash	11.6	17.1	19.0	3.6	4.5	55.2	5.1	7.0	7.4
1	George B. Brown Corp. Dairy Feed	12.1	17.3	20.0	3.6	4.0	51.9	9.4	12.0	5.7
2	Egg Mash	11.6	17.2	17.0	3.8	5.0	54.0	4.8	10.0	8.6
1	Community Service, Inc. 16 Dairy Ration	9.7	18.3	16.0	3.9	3.5	52.9	9.5	11.0	5.7
1	Fitting Ration	10.1	17.7	14.0	4.1	3.5	54.5	7.5	8.5	6.1
1	Complete Pig Feed	11.2	13.9	14.0	3.1	4.0	62.4	4.4	8.0	5.0
1	Poultry Mash	11.0	19.7	18.0	3.7	4.0	56.5	5.0	6.5	4.1
1	Starter and Grower Mash	10.1	19.8	17.0	3.3	4.0	51.9	5.0	6.5	9.9
1	O. A. Cooper Co. Best 18% Egg Mash	13.8	17.4	18.0	3.8	3.25	50.8	5.3	8.0	10.7
1	Best Laying and Gto Mash	11.9	15.1	15.0	3.0	2.25	58.3	4.9	7.0	5.2
2	Best 16% Dairy Feed	11.1	16.5	16.0	3.0	2.5	51.5	10.7	14.0	6.4
2	Courcy Grain Co. Dairy Feed	11.1	19.6	20.0	3.5	3.5	52.7	6.1	7.0	7.0
2	Eastern Milk Laying Mash	11.2	18.2	18.0	3.4	4.0	52.6	5.0	7.0	9.6
2	Chas. M. Cox Co. Du-Ration 16% Dairy Feed	10.6	17.2	16.0	3.2	3.0	56.5	6.1	9.0	6.4
2	Du-Ration 12% Dairy Feed	12.0	14.2	12.0	2.8	3.0	61.9	4.6	9.0	4.5
4	Du-Ration Poultry Mash	11.9	18.4	18.0	2.9	3.0	54.2	4.8	7.0	7.8
4	Du-Ration Stock Feed	11.7	12.5	10.0	2.4	2.0	61.7	6.5	9.5	5.2
1	Wirthmore Breeder Mash Pellets	10.7	20.4	20.0	3.2	3.0	52.3	5.1	7.0	8.3
3	Wirthmore Complete Breeder Pellets	11.7	16.3	15.0	3.8	3.0	57.2	4.7	6.0	6.3
3	Wirthmore Complete Egg Ration	12.3	16.2	15.0	3.8	3.0	57.9	4.2	6.0	6.6
5	Wirthmore 14 Fitting Ration	12.3	15.0	14.0	4.2	4.0	57.0	6.2	8.0	5.3
1	Wirthmore Fodder Greens	11.1	15.1	10.0	3.5	3.5	52.1	11.8	15.0	6.4
1	Wirthmore Complete Growing	11.7	16.5	15.0	2.6	3.0	58.4	4.4	7.0	6.4
1	Wirthmore Laying Mash Pellets	11.1	19.1	20.0	2.9	3.0	55.2	4.7	7.0	7.0
1	Wirthmore Rabbit Pellets	9.9	14.6	14.0	3.6	3.0	55.1	10.5	15.0	6.3
1	Wirthmore Starter and Broiler Ration	10.9	21.0	20.0	2.7	3.0	53.4	4.4	6.5	7.0
2	Wirthmore 16 Record Ration	11.8	16.3	16.0	3.9	4.0	54.4	6.8	8.0	6.8
8	Wirthmore Standard 18 Dairy	11.0	18.2	18.0	4.0	3.0	53.7	7.1	8.5	6.0
1	Wirthmore Standard 16 Dairy	11.2	18.2	16.0	3.5	4.0	55.8	5.3	8.5	6.0
3	Wirthmore Turkey Fattening	11.3	19.5	16.0	2.6	3.0	55.6	4.2	7.0	6.8
3	Wirthmore Turkey Growing Ration	10.9	20.9	20.0	2.6	3.0	52.4	4.5	7.0	8.7
1	Wirthmore Turkey Starting Ration	10.0	25.4	25.0	3.8	3.0	48.3	5.1	7.0	7.4
1	Curley Grain & Fuel Co. Crystal Complete Laying Mash	14.2	16.9	15.0	4.3	4.0	54.0	4.8	9.0	5.8
1	Crystal Growing Mash	13.9	17.3	16.0	4.0	5.0	54.2	4.7	7.0	5.9

Complete Average Analyses of Commercial Feeds Collected (Percent)—Continued

Num- ber of Analy- ses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitro- gen Ex- tract		Fiber		Ash
			Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Dailey Mills, Inc.											
1	All Mash Broiler	9.9	16.1	15.0	3.1	3.5	56.4	7.0	8.0	7.5	
1	All Mash Broiler	11.4	19.9	18.0	4.0	3.5	52.6	6.0	7.0	6.1	
1	All Mash Grower	9.5	15.1	14.0	3.4	3.5	56.7	7.3	8.5	8.0	
2	Egg Producer Mash	10.1	22.4	19.0	2.9	4.0	46.3	6.5	7.0	8.8	
1	Egg Producer Mash	12.5	19.2	17.0	2.4	4.0	53.6	5.3	7.0	7.2	
2	18% Milk Producer	10.1	18.5	18.0	3.3	4.0	52.8	7.6	10.0	7.7	
1	18% Milk Producer	11.7	21.5	18.0	3.6	3.5	49.0	8.7	10.0	5.5	
1	Emergency Mash	11.2	14.5	14.0	2.7	3.5	58.2	5.9	8.0	7.5	
3	Erosionex	11.7	21.3	22.0	3.7	4.0	51.7	7.0	7.0	5.9	
2	Fitting Ration	11.8	15.6	14.0	3.4	4.0	55.6	8.1	7.0	5.5	
1	Fitting Ration	13.0	15.8	14.0	3.9	3.5	54.2	8.2	7.0	4.9	
1	Goat & Kid Ration	11.1	18.6	16.0	3.5	4.0	52.9	6.2	8.0	7.2	
1	Horse Feed	10.2	13.6	10.0	3.2	3.0	47.7	11.9	8.0	13.4	
4	Range Growing Mash	11.5	19.4	17.0	2.8	3.0	54.8	5.5	7.0	5.2	
4	Revtalizer	12.1	14.8	13.0	3.9	3.5	60.6	3.6	4.0	5.0	
3	Special Pig & Hog Ration	10.4	16.1	13.0	3.8	4.0	53.6	7.4	10.0	8.7	
1	Starter & Broiler Mash	10.1	21.6	20.0	4.0	4.0	53.6	6.3	7.0	4.4	
2	Straight Money Maker 18%	11.6	16.3	18.0	3.4	3.5	54.8	7.2	12.0	6.7	
2	Super All Mash Layer	11.0	15.9	14.0	3.1	3.5	56.2	6.5	8.0	7.3	
2	Super 18% Dairy Ration	11.2	18.5	18.0	3.7	4.0	52.5	7.4	8.0	6.7	
1	Super Hatch Producer	10.8	20.9	20.0	2.6	4.0	53.3	4.7	7.0	7.7	
1	Super Laying Mash	11.9	19.2	18.0	2.4	4.0	54.1	5.5	7.0	6.9	
2	Super Laying Mash	10.3	23.5	20.0	2.8	4.0	50.5	5.1	7.0	7.8	
2	Wormex	10.4	22.8	22.0	5.1	4.0	46.2	6.2	7.0	9.3	
Delaware Mills, Inc.											
1	Breeder Mash	11.7	20.9	20.0	3.2	3.0	53.0	5.0	8.0	6.2	
1	Calf Meal	12.0	22.0	22.0	3.6	4.0	53.7	3.9	7.0	4.8	
3	Egg Mash	11.7	19.4	19.0	2.8	3.0	56.0	4.9	9.0	5.2	
1	Grow Mash	12.9	17.4	16.5	3.1	3.0	56.0	4.7	9.0	8.0	
1	Laying Mash	12.1	20.0	20.0	3.3	3.0	55.8	5.0	8.0	3.8	
1	Pig and Hog Feed	13.0	15.5	16.0	3.1	4.0	60.2	4.3	8.0	3.9	
1	Indian Sweet 18% Dairy Feed	11.4	19.7	18.0	4.5	3.0	48.6	8.8	11.0	7.0	
F. Diehl & Son, Inc.											
1	Dairy Feed	10.4	19.6	18.0	3.4	3.0	52.2	7.7	14.0	6.7	
1	Dry Mash	10.5	19.9	16.0	3.8	3.0	52.1	5.1	12.0	8.6	

1	Dietrich & Gambrell, Inc.	D & G All Purpose Complete Ration	11.1	16.7	15.0	3.6	4.0	55.7	6.4	7.0	6.5
1		D & G Growing & Fitting Ration	11.4	16.7	13.0	3.5	4.0	54.7	7.0	10.0	6.7
1		Federick Laying Mash	12.2	18.3	18.0	3.6	3.5	53.7	5.9	9.0	6.3
1		Gambrell's Chick Starter	11.0	20.5	18.0	3.6	4.0	51.9	5.9	6.0	7.1
1		Gambrell's Growing Mash	11.6	19.8	18.0	3.7	4.0	52.4	5.5	8.0	7.0
1		Gambrell's Laying Mash	11.9	21.7	20.0	4.0	4.0	48.5	6.5	8.0	7.4
Eastern States Farmers' Exchange											
1		All-Mash Developer	10.5	16.0	14.0	3.5	2.5	58.7	5.0	6.0	6.3
1		All-Mash Egg	10.2	17.4	15.5	3.5	4.0	55.6	5.0	5.5	8.4
2		All-Mash Egg	10.5	17.0	15.5	3.4	3.0	55.7	5.0	5.5	8.4
1		Breeder Concentrate Pellets	9.8	22.5	20.0	5.0	3.5	47.7	6.0	6.0	9.0
1		Call Starter Pellets	9.1	28.2	23.0	4.8	4.5	45.1	5.2	6.0	7.6
2		Calving Ration	11.9	13.1	10.0	2.6	1.5	49.9	14.7	18.0	7.8
2		Egg Mash	9.9	20.5	20.0	4.1	3.0	50.4	5.8	7.0	9.3
2		Fitting Ration	12.7	14.0	14.0	3.4	2.5	55.8	7.6	9.0	5.7
3		Sixteen	11.2	18.1	16.0	3.9	3.5	54.4	7.1	8.5	5.3
3		Starting and Broiler	9.9	19.1	18.0	3.2	2.5	50.5	4.6	6.0	6.7
2		Stock Feed	12.8	12.8	11.5	3.1	2.0	60.8	4.6	7.5	5.1
1		28% Supplement Feed	9.9	29.3	28.0	3.6	4.0	42.1	7.1	7.5	8.0
Elmore Milling Co., Inc.											
1		Breeder Mash	11.7	19.5	20.0	4.1	4.0	52.0	5.3	8.0	7.4
1		Chick Feed	13.4	12.1	10.0	2.2	2.5	68.9	1.9	3.5	1.5
1		Chick Saver	11.1	20.5	18.0	4.9	4.0	49.0	6.9	7.0	7.6
3		Complete Market Egg Mash	10.4	17.7	15.0	4.6	4.0	54.7	5.6	8.0	7.0
2		Complete Growing Ration	11.2	16.5	15.0	3.3	4.0	56.5	6.2	6.0	6.3
1		Complete Layer and Breeder	12.6	17.6	15.0	4.1	3.5	51.7	6.5	8.0	7.5
1		Complete Starter-Broiler	11.1	17.7	18.0	4.1	4.0	56.1	4.2	7.0	6.8
1		Complete Starter-Broiler	11.7	18.5	18.0	4.1	3.5	52.1	5.5	7.0	6.1
2		Complete Starter-Broiler	11.0	19.2	17.0	3.6	4.0	51.4	7.1	7.0	7.7
1		Egg Mash	11.1	19.5	20.0	4.1	4.0	52.6	5.6	8.0	7.0
1		Egg Mash	11.1	18.8	18.0	4.1	4.0	51.7	5.2	8.0	8.0
1		Fitting Ration	10.1	19.3	14.0	4.1	4.0	54.6	7.6	9.0	4.3
1		Fitting Ration	12.5	17.0	12.0	3.7	4.0	54.6	4.7	10.0	4.7
1		Fleshing Pellets	11.8	16.8	15.0	4.1	4.0	56.1	4.8	8.0	6.4
2		Growing Mash	11.2	19.5	17.0	4.0	4.0	51.9	6.4	8.0	7.0
2		Hog Ration	11.6	16.6	15.0	3.5	5.0	60.7	4.1	6.0	3.5
2		Improved Calf Starter	11.3	21.6	20.0	5.2	4.0	49.8	5.0	8.0	7.1
1		Milk Grains "Twenty-Four"	10.1	24.6	24.0	5.4	4.5	48.9	8.9	10.0	5.1
2		Milk Grains "Sixteen"	9.8	20.4	16.0	5.2	4.0	50.5	8.3	10.0	5.8
1		Milk Grains "Sixteen"	12.0	19.2	16.0	4.4	4.0	52.0	8.0	4.4	4.4
1		Rabbit Ration	10.5	16.2	14.0	3.6	3.5	57.7	7.6	10.0	4.4
2		Turkey Growing Mash	10.1	18.8	20.0	4.2	3.5	53.9	5.3	8.0	7.7
1		Turkey Growing Mash (Pellets)	12.1	21.3	18.0	4.2	3.5	46.9	6.6	8.0	8.9
1		Turkey Finisher (Fattener)	13.2	21.7	17.0	4.6	4.0	48.1	6.5	8.0	5.9
1		Granger 16% Dairy Ration	11.4	17.6	16.0	4.5	3.5	54.7	7.5	10.0	4.3

Complete Average Analyses of Commercial Feeds Collected (Percent)—Continued

Num-ber of Analy-ses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
John W. Eshelman & Sons										
1	Red Rose Broiler Ration	12.5	17.4	16.5	3.6	3.75	52.8	0.6	7.5	7.1
2	Red Rose Call Starter	10.3	21.9	14.0	4.0	3.0	53.8	4.2	5.0	5.8
1	Red Rose Complete Calf Grower	12.4	16.8	14.0	4.2	3.25	54.4	6.3	8.0	5.9
1	Red Rose 24 Dairy Feed	11.9	24.5	24.0	4.2	4.0	46.3	7.4	11.0	5.7
1	Red Rose 18 Dairy Feed	10.7	19.0	18.0	3.9	4.75	54.4	6.7	9.0	5.3
1	Red Rose 18 Dairy Feed	13.0	20.2	18.0	3.4	4.0	52.1	6.1	8.0	5.2
1	Red Rose 16 Dairy Feed	10.4	17.2	16.0	4.0	4.5	56.3	7.1	11.0	5.0
1	Red Rose 16 Dairy Feed	13.0	18.7	16.0	3.7	4.0	54.1	5.9	11.0	4.6
1	Red Rose Fatening Mash	15.1	15.1	14.0	2.9	4.0	60.5	3.7	5.5	4.5
1	Red Rose Fitting Ration	14.1	14.2	12.0	3.7	4.0	58.3	5.0	7.0	4.7
1	Red Rose 85 Horse Feed	14.6	10.7	9.0	3.4	3.0	59.6	7.9	10.0	3.8
1	Red Rose Laying Mash (Pellets)	9.5	20.0	18.5	3.1	1.0	55.1	6.0	7.5	6.3
1	Red Rose Laying Mash	13.2	19.6	18.5	3.6	3.5	52.1	5.8	7.5	5.7
1	Red Rose Pig & Hog Meal	12.7	20.4	18.0	4.0	3.5	48.0	7.2	10.0	7.7
1	Red Rose Starter & Grower	13.0	16.9	16.0	3.6	3.5	51.6	5.7	7.0	6.2
Essex County Co-operative Farming Assn.										
1	S-X All-Mash Egg	10.9	20.9	15.5	3.2	4.0	53.8	4.9	6.0	6.3
1	S-X All-Mash Growing	11.1	17.6	15.0	3.2	3.75	58.4	4.7	6.0	5.0
1	S-X Growing Mash	10.5	20.7	18.5	3.3	3.75	53.7	6.0	7.0	5.8
1	S-X Brooder Mash	10.3	21.7	20.0	3.6	4.0	52.7	4.8	7.0	6.9
1	S-X 18 ^{1/2} Dairy	10.7	18.3	18.0	3.5	4.0	55.0	6.5	8.5	6.0
2	S-X Egg Mash	10.9	20.8	20.0	3.3	4.0	54.0	4.7	7.0	6.3
1	S-X 14 ^{1/2} Fitting	11.6	16.8	14.0	3.8	3.5	53.9	8.0	8.5	5.9
1	S-X Starter and Broiler	10.7	20.0	18.5	3.4	4.0	55.6	5.1	6.5	5.2
George A. Fair										
2	Fair Square Dairy Feed	12.6	18.4	20.0	3.9	4.5	53.2	6.5	8.5	5.4
1	Fair Square Growing Mash	10.8	16.9	18.0	4.1	4.0	53.6	5.1	6.5	6.5
1	Fair Square Laying Mash	12.0	15.4	17.0	3.8	4.0	54.8	4.8	6.5	9.2
2	Fair Square Starter and Broiler Mash	11.1	16.7	18.0	3.7	4.0	54.6	5.2	5.0	8.7
Flory Milling Co., Inc.										
3	All-Mash Egg & Breeder Ration	10.9	18.2	16.0	3.6	4.0	54.2	5.8	7.0	7.3
1	Broiler Mash	8.7	20.7	19.0	4.2	3.0	51.3	7.0	7.5	8.1
1	Complete All-Mash Ration	10.9	19.2	15.5	3.7	3.5	51.9	6.1	7.0	8.2

1	Egg & Breeder Mash	9.9	19.3	21.0	3.1	4.0	52.2	5.1	7.5	10.4
3	18% Dairy Feed	12.3	19.3	18.0	3.1	4.0	52.0	7.3	10.0	9.0
1	18% Dairy Feed	15.6	17.0	18.0	1.9	3.0	54.7	5.5	10.0	5.5
2	18% Growing Mash	9.9	19.8	18.0	3.6	3.0	52.0	7.5	7.1	7.5
1	Fattener & Fleshing Pellets	8.0	17.0	14.0	5.3	5.0	56.9	7.5	7.0	5.3
2	Hog Meal	11.1	17.5	15.0	2.7	3.0	56.0	5.1	9.0	7.6
3	Laying Mash	9.4	21.0	20.0	3.3	3.5	47.2	7.5	9.2	9.2
1	Rabbit Pellets	14.5	13.5	14.0	2.8	3.0	55.3	7.6	9.0	6.3
3	16% Growing Mash	10.6	20.0	16.0	3.8	3.0	49.2	6.9	7.5	9.5
2	Starter Mash	11.7	20.1	20.0	3.7	3.0	51.1	6.0	7.0	7.4
2	National 18% Dairy Feed	10.8	18.9	18.0	3.0	3.5	53.3	8.2	11.0	5.8
3	National 16% Dairy Feed	13.4	16.8	16.0	2.8	3.0	52.5	8.4	11.0	6.1
1	Turkey Grower (Pellets)	10.5	19.5	20.0	3.5	3.5	51.1	6.0	7.5	9.4
Fred A. Fountain										
1	Breeder Mash	10.2	19.3	18.0	4.2	4.5	53.2	6.8	6.0	6.3
1	Growing Mash	11.7	18.6	16.0	3.9	4.0	52.2	6.2	7.0	7.4
1	Laying Mash	11.2	19.9	18.0	4.0	4.0	52.4	4.8	7.0	7.7
1	Starter and Broiler Ration	10.5	19.4	17.5	4.1	4.0	52.5	6.2	7.0	7.3
J. B. Garland & Son, Inc.										
2	Complete Starter and Broiler Ration	11.4	18.0	17.0	3.6	3.5	55.5	4.6	7.0	6.9
1	Fitting Ration	12.4	13.8	12.0	4.0	4.1	61.1	4.1	7.0	5.3
2	Growing Mash	11.5	16.3	14.0	3.7	4.0	56.4	5.1	7.0	7.0
1	Laying Mash	11.3	17.5	18.0	3.7	4.0	57.8	4.6	7.0	5.1
3	Pig & Hog Ration	13.1	17.0	17.0	3.7	4.0	55.0	4.2	8.0	7.0
1	16% Dairy Ration	11.8	16.8	16.0	4.1	4.0	55.9	6.1	9.0	5.3
1	Royal Complete Laying Ration	13.5	14.7	15.0	3.7	4.0	58.3	4.5	6.0	5.3
1	Royal 16% Dairy Ration	11.9	18.0	16.0	3.9	3.0	52.1	8.2	12.0	5.9
General Mills, Inc., Farm Service Div.										
1	Farm Service Growing Mash	11.4	21.0	19.0	4.1	3.5	51.4	4.8	7.5	7.3
4	Farm Service Laying Mash	11.3	21.6	20.0	4.0	3.5	51.2	5.5	8.0	6.4
1	Farm Service Stock Feed	10.9	9.5	8.5	2.9	3.0	60.1	11.5	12.0	5.1
General Mills, Inc., Larrowe Div.										
3	Larro Breeder Mash	10.7	20.8	20.0	4.2	4.0	50.2	4.8	8.0	9.3
1	Larro 18% Broiler Feed	9.5	17.4	18.0	3.7	3.5	57.7	3.9	7.0	6.8
3	Larro Calf Builder	10.7	24.7	24.0	5.1	4.0	49.9	4.7	5.5	5.9
2	Larro Chick Builder	10.3	19.6	19.0	3.6	3.5	54.6	4.8	7.0	7.1
2	Larro Chick Builder	12.2	19.9	19.0	3.5	3.0	53.0	4.7	7.0	6.7
4	Larro 18% Dairy Feed	10.7	18.6	18.0	3.4	3.25	54.3	7.3	12.0	5.7
3	Larro 18% Dairy Feed	12.0	18.6	18.0	3.4	3.0	53.7	6.9	12.0	5.4
3	Larro 16% Dairy Feed	11.7	17.1	16.0	3.0	3.0	56.1	7.2	12.0	4.7
2	Larro Egg Mash	10.1	18.8	18.0	3.5	4.0	56.3	4.2	8.0	7.1
4	Larro Egg Mash	11.7	18.0	18.0	3.8	3.25	53.0	5.3	8.0	7.6
2	Larro Sow and Pig Builder	10.4	17.5	16.0	3.5	3.5	54.7	7.3	8.0	6.6
2	Larro Sow and Pig Builder	11.7	16.7	16.0	3.7	3.0	56.3	5.8	8.0	5.8
1	Larro Turkey Builder	8.9	26.1	24.0	4.1	4.0	47.1	6.1	7.5	7.7
2	Larro Turkey Finisher	11.9	19.8	19.0	3.6	3.0	51.0	5.6	7.5	8.1

Complete Average Analyses of Commercial Feeds Collected (Percent)—Continued

Num-ber of Analy-ses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Glidden Co., Feed Mill Div.										
1	Broiler Ration	10.8	19.2	18.0	2.5	2.0	53.0	6.4	9.0	8.1
1	18% Steer & Calf Fattener	8.6	20.0	18.0	4.9	2.0	40.4	15.8	20.0	10.3
1	Pork Builder	11.0	16.9	14.0	2.3	2.0	56.8	6.5	12.0	6.5
Goode Grain Co.										
1	Laying Mash	12.3	17.5	17.0	2.8	4.0	52.9	6.8	8.0	7.7
2	Starting Growing Mash	12.5	18.6	16.0	3.3	4.0	51.3	7.2	8.0	7.1
D. H. Grandin Milling Co.										
1	Baby Chick Grains	12.4	13.5	10.0	2.2	2.5	68.0	2.4	5.0	1.5
1	Breeder Mash	9.4	19.7	20.0	4.7	4.0	49.9	5.9	8.0	10.4
4	Emergency 16 Dairy Feed	10.8	16.4	16.0	3.0	3.0	56.6	7.2	10.0	6.0
4	Emergency Poultry Mash	10.7	18.1	18.0	2.7	3.0	55.0	5.3	10.0	8.2
1	Emergency Stock Feed	11.8	12.1	12.0	2.4	3.0	60.1	8.4	12.0	5.2
2	Growing Mash	10.3	18.6	17.0	3.1	4.0	52.5	5.7	8.0	9.8
1	Laying Mash	9.4	19.0	20.0	3.4	4.0	52.7	5.6	8.0	9.9
2	Laying Mash	10.7	18.5	18.0	3.6	3.5	53.1	5.9	8.0	8.2
2	Pig and Hog Ration	12.0	17.0	18.0	2.3	4.0	59.1	3.4	10.0	6.2
1	16 Milk Maker	11.1	17.4	16.0	3.7	4.0	56.8	6.5	10.0	5.1
1	16 Milk Maker	12.0	16.1	16.0	3.5	3.5	53.6	8.1	10.0	6.5
1	16 Test Cow Ration	10.9	16.8	16.0	3.3	4.0	54.4	8.8	9.0	4.8
1	16 Test Cow Ration	13.0	16.8	16.0	3.8	3.5	51.4	8.6	9.0	7.4
5	Start-To-Finish Mash	11.2	18.4	18.0	3.4	4.0	54.4	5.2	8.0	7.8
2	Start-To-Finish Mash	12.0	18.0	18.0	3.7	3.0	51.7	6.1	8.0	8.1
2	Turkey Grower	10.5	20.4	20.0	4.4	4.0	48.9	6.4	8.0	9.4
Hales & Hunter Co.										
1	Pioneer Calf Starter	11.6	19.1	18.0	3.8	2.5	53.9	6.2	10.0	5.4
2	Pioneer 18 Dairy Feed	11.6	21.7	18.0	3.4	3.0	51.4	5.7	9.0	6.2
1	Pioneer 14 Dairy Feed	11.7	15.5	14.0	3.3	3.5	58.0	6.4	9.0	5.1
1	Pioneer Dry & Freshening Feed	11.5	15.6	12.0	3.6	2.5	55.8	6.8	10.0	6.7
2	Red Comb Breeder Mash	11.0	18.7	18.0	3.8	3.5	53.4	4.7	7.0	8.4
1	Red Comb Broiler Mash	10.3	22.0	18.0	3.2	3.5	53.5	4.9	7.0	6.1
1	Red Comb Chick Starter	10.5	26.4	18.0	3.3	3.5	55.2	4.8	6.0	5.8
7	Red Comb Egg Mash	10.8	18.8	18.0	3.0	3.5	55.0	4.8	7.0	7.6
1	Red Comb Growing Mash	10.9	17.7	16.0	3.3	3.5	55.9	5.7	7.0	6.5

Complete Average Analyses of Commercial Feeds Collected (Percent)—Continued

Num- ber of Anal- yses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
			Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
Middlesex County Farm Bureau Assn.										
1	Chick Grains	13.4	13.3	9.5	2.1	2.0	67.7	1.9	3.0	1.6
1	Complete Market Egg Mash	10.6	14.3	15.0	3.7	3.5	56.4	6.8	6.5	8.2
2	Conditioner and Fattener Mash	12.1	18.2	16.5	4.1	4.0	55.6	4.6	7.0	5.6
2	Fitting Ration	10.4	14.0	12.5	3.2	3.5	57.7	6.9	9.0	5.5
1	Flushing Mash	10.4	13.5	13.0	3.6	3.5	63.1	4.4	4.5	5.0
2	18% Test Ration	12.6	18.0	18.0	3.7	3.5	47.7	6.2	9.5	6.2
2	Laying Mash 17% (Breeder)	11.0	20.6	17.0	3.6	3.5	50.3	5.7	7.5	8.8
2	Market Egg Mash	10.9	19.9	20.0	3.5	4.0	50.4	8.7	7.0	9.5
2	16% Dairy Ration	12.0	17.9	16.0	4.1	4.0	52.0	8.7	8.0	5.3
1	Starter and Broiler	10.1	21.4	18.5	3.9	4.0	50.3	7.4	7.5	6.9
1	Turkey Grower and Finisher	10.2	21.0	20.0	3.3	4.0	49.9	7.4	7.0	8.3
2	Victory Mash	12.4	19.9	17.0	3.7	3.0	51.6	5.4	7.5	7.0
Geo. Q. Moon & Co., Inc.										
1	Complete Laying Mash	10.9	18.6	17.0	2.1	4.0	55.9	4.9	7.0	7.6
2	Complete Laying Mash	11.5	17.6	17.0	2.9	3.5	55.0	5.6	7.0	7.4
1	Complete Starter and Broiler Mash	11.3	17.1	18.5	3.3	3.5	56.3	5.9	6.0	6.1
1	Fitting Ration	12.6	16.2	13.0	3.6	3.0	56.1	5.4	9.0	6.1
2	Hog Feed	11.5	18.4	13.0	3.7	3.5	55.2	6.5	8.0	4.7
2	90 Horse Feed with Molasses	12.0	13.5	9.0	3.5	3.0	58.3	8.8	3.9	3.9
2	Special A Dairy 18% Ration	11.5	18.0	18.0	4.6	4.0	53.4	6.5	10.0	6.0
4	Special A Dairy 16% Ration	11.7	17.1	16.0	3.8	4.0	54.8	6.2	10.0	6.4
1	Special A Laying Mash	10.1	20.9	18.0	3.2	3.5	51.6	6.2	9.0	8.0
1	Special A Laying Mash	11.3	18.8	18.0	3.0	3.0	52.9	5.9	9.0	8.1
New England Grain Co.										
2	Pig & Hog Ration	13.2	16.0	15.0	4.0	5.0	54.2	6.1	10.0	6.5
3	Sterling Laying Mash	11.8	18.3	18.0	4.2	5.0	52.9	5.4	8.0	7.4
2	Sterling 16% Dairy Feed	12.0	17.0	16.0	3.6	3.5	54.3	8.3	11.0	4.8
3	Sterling Starter and Growing Feed	12.0	17.5	17.0	3.8	5.0	54.3	5.1	8.0	7.3
Ogden Grain Co.										
3	"Biddy" Laying Mash	12.5	18.0	18.0	4.0	4.0	52.8	6.0	7.0	6.7
3	Cloverbloom 18% Dairy Feed	10.4	19.9	18.0	4.0	3.5	50.3	8.6	12.0	6.8
1	Pilgrim Flush-Conditioner	10.7	16.4	14.0	4.5	3.0	55.8	4.1	6.0	8.5
1	Pilgrim Growing Mash	11.6	19.6	18.0	3.8	4.0	53.0	5.1	8.0	6.9
1	Pilgrim Starter-Grower Layer	12.9	15.4	15.0	3.1	4.0	57.1	6.1	8.0	5.4
1	Pilgrim Supplemental Pellets	11.2	18.4	24.0	2.6	4.0	55.0	5.2	7.0	7.6

Park & Pollard Co.

1	Chick Starter	17.0	3.1	3.0	51.3	6.1	7.0	7.0
2	Doublex 18% Dairy Ration	18.0	3.8	3.5	50.3	8.8	6.6	6.6
1	Doublex 16% Dairy Ration	16.0	3.8	3.5	51.0	9.0	12.0	6.6
1	Fattening Ration	13.9	3.1	3.0	58.6	8.0	8.0	5.6
3	Fleshing Pellets	17.2	3.2	3.0	56.7	6.1	7.0	5.0
2	Go-Tu-It Pig & Hog Ration	18.3	2.8	2.5	58.9	5.9	8.0	6.1
3	Go-Tu-It Pig & Hog Ration	18.8	2.9	2.5	58.8	6.2	7.0	9.3
4	Growing Feed	15.0	2.6	3.0	55.8	6.5	7.0	6.6
4	Horse Feed	13.3	3.0	3.0	58.4	6.9	9.0	5.2
1	Lay or Bust Dry Mash	10.0	3.1	3.0	52.4	6.7	7.0	7.6
3	Laying Pellets	18.0	3.8	3.0	53.8	5.4	7.0	6.3
1	Lay & Breeder Pellets	20.0	3.6	3.0	53.0	6.7	6.5	5.6
3	Milksmaid 18% Dairy Feed	16.0	3.3	3.5	50.7	7.5	10.0	6.3
3	Milksmaid 16% Dairy Feed	17.9	3.2	3.5	53.7	7.2	10.0	5.9
1	Starter & Broiler Mash	20.1	2.9	3.5	55.6	5.3	6.0	4.7
1	Yankee Horse Feed	11.5	3.1	3.0	59.1	6.4	9.0	4.9

George H. Parker Grain Co.

2	Egg Mash	18.0	3.8	5.0	54.7	5.8	7.0	7.8
2	Growing Mash	17.0	3.4	4.5	56.2	5.1	6.0	7.4

Quaker Oats Co.

3	Full-O-Pep Calf Starter	20.0	5.4	4.5	50.9	6.5	8.0	6.6
1	Full-O-Pep Chick Starter	17.0	5.2	4.5	55.6	4.7	7.0	6.0
1	Full-O-Pep 18% Dairy Ration	18.0	4.0	4.5	51.1	8.2	9.0	5.5
2	Full-O-Pep Egg Breeder Mash	20.0	5.2	4.5	51.4	6.1	8.0	7.2
3	Full-O-Pep Laying Mash	20.0	3.7	4.0	52.5	7.0	8.0	6.6
1	Full-O-Pep 16% Dairy Ration	17.5	4.0	3.5	52.7	7.1	9.0	5.1
2	Full-O-Pep Super Greens Pelleted	18.6	5.1	4.5	53.6	6.7	8.0	6.7
1	Full-O-Pep Turkey Grower	20.8	4.0	4.0	52.8	7.0	8.0	5.6
2	Quaker 18% Protein Dairy Ration	18.9	3.4	3.0	48.9	12.0	14.0	6.0
2	Quaker 16% Protein Dairy Ration	17.2	3.5	3.0	51.0	12.4	15.0	6.7
1	Quaker Sugared Schmutacher Feed	10.0	3.3	3.0	60.9	10.9	12.0	4.5

Ralston Purina Co.

4	B & M Cow Chow	18.1	4.0	3.5	51.8	8.1	10.0	6.5
2	Breeder Lay Chow	22.3	5.1	3.5	46.2	6.4	8.0	10.0
2	Broiler Chow Checkers	18.0	4.2	3.5	53.2	6.6	7.0	5.9
1	Broiler Layena	17.1	4.4	3.5	54.0	4.6	8.0	8.0
5	Calf Startena	20.7	3.4	2.5	49.8	8.0	7.5	9.5
1	Chick Growena Checkers	18.5	3.7	3.5	56.4	4.7	7.0	5.5
1	Chick Growena	17.0	3.9	3.0	57.1	3.8	7.0	5.2
4	Dry & Freshening Chow	13.3	3.9	2.0	51.4	8.1	14.0	9.6
1	Eggena (Complete Ration)	15.5	3.4	3.0	56.4	6.1	8.0	7.3
2	Hot Fatena	16.2	3.4	3.0	58.7	6.5	7.0	4.4
1	18% Lay Chow	18.9	4.0	3.0	51.4	5.5	8.0	8.7
1	22% Lay Chow	22.0	4.3	3.5	46.2	6.0	8.0	6.6
3	Layena (Complete Ration)	16.4	3.4	3.5	58.2	5.1	8.0	8.5
1	Milk Chow (16%)	16.6	3.3	3.0	53.7	7.2	10.0	7.4

Complete Average Analyses of Commercial Feeds Collected (Percent)—Concluded

Number of Analyses	MANUFACTURER AND BRAND	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
			Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
Kaiston Purina Co.—Continued										
1	Turkey Breeder Chow	11.2	24.6	25.0	4.1	4.0	43.9	7.1	8.0	9.1
1	Turkey Fatena Checkers	11.4	15.2	14.0	3.9	3.5	61.1	4.4	7.0	4.0
1	Turkey Fatena Checkers	13.1	14.1	14.0	3.1	3.0	61.7	4.7	7.0	3.8
1	Turkey Growola	11.6	16.2	18.0	3.1	3.5	59.3	4.1	7.0	5.7
1	Turkey Layena (Complete Ration) Checkers	11.8	16.0	16.5	3.1	3.5	56.6	5.2	8.0	7.3
1	Turkey Startena	10.1	25.1	24.0	4.8	4.0	46.3	5.6	7.0	8.1
D. F. Riley										
1	Laying Mash	12.4	17.5	20.0	4.4	4.5	50.8	5.9	6.0	9.0
1	20% Ration	12.3	19.1	20.0	4.7	4.5	49.5	7.8	9.0	6.5
Ryther & Warren Co.										
2	Blue Tag Dairy Ration	12.4	18.6	18.0	3.6	4.0	53.9	5.7	10.0	5.8
1	Minot Chick Mash	12.7	19.3	18.0	4.4	4.0	50.3	6.1	5.0	7.2
2	Minot Growing Mash	11.4	18.2	18.5	3.4	4.5	54.2	5.1	6.0	7.7
2	Minot Milk Egg Mash	11.8	18.0	17.0	3.6	4.5	53.7	5.5	7.0	7.4
Sargent & Co.										
1	Record Dairy Feed	11.2	14.9	18.0	3.6	3.5	53.3	10.0	14.0	7.0
1	Record Egg Mash	12.2	15.2	18.0	3.8	3.5	56.7	4.8	12.0	7.3
United Cooperative Farmers, Inc.										
1	Breeder	11.1	21.0	18.0	4.5	3.0	50.5	5.1	8.0	7.8
1	16% Dairy	11.6	18.1	16.0	3.3	3.5	54.6	6.5	10.0	5.9
1	Layer	11.2	20.5	18.0	4.4	3.0	50.6	5.2	8.0	8.1
1	Starter	11.3	18.7	19.0	3.8	4.0	55.5	4.7	8.0	6.0
Unity Feeds, Inc.										
1	18% Dairy Ration	10.6	19.5	18.0	4.7	4.0	52.2	7.5	10.0	5.5
1	Fitting Ration	11.7	14.2	12.0	4.0	4.0	58.6	5.4	7.0	5.9
1	Life Saver Mash	11.1	19.0	17.0	2.6	3.0	53.6	5.4	8.0	8.3
2	Paycheck 18% Dairy Ration	9.6	22.5	18.0	4.4	4.0	47.6	9.0	11.0	6.9
1	Pig and Hog Ration	10.6	21.3	17.0	4.1	4.0	50.6	5.5	8.0	7.7
Arthur Ventura Grain Co.										
2	Everyday Dairy	11.0	19.4	22.0	2.9	4.5	54.5	6.3	7.0	5.9
1	Grower	11.9	16.0	16.6	2.6	4.0	60.3	3.5	6.0	5.7
2	Laying Mash	11.6	18.0	19.0	3.2	5.0	54.8	4.3	7.0	8.1
1	Starter	11.4	17.8	17.0	3.2	4.0	51.7	5.1	6.0	10.8

1	O. B. Vunck & Co., Inc.	10.7	17.5	4.3	4.0	5.5	6.5	5.6
1	Cortland Growing Mash	10.2	18.0	4.3	4.0	5.6	7.0	7.8
1	Cortland Laying Mash	10.4	18.7	4.2	4.0	5.0	6.0	7.1
2	C. P. Washburn Co.	12.2	18.0	3.0	3.5	4.1	7.0	5.7
1	Made Right Dry Mash	11.9	16.0	2.7	3.5	3.5	12.0	4.2
2	Made Right 16% Dairy	12.1	18.0	2.8	3.5	4.4	7.0	7.7
2	Made Right Starting and Growing Feed							
2	Wayne County Grangers Feed Corp.	12.6	18.1	3.6	4.0	7.2	10.0	4.9
1	Superior 18% Dairy Feed	11.2	16.4	3.4	3.5	5.6	7.5	4.0
1	Superior Laying Mash							
4	H. K. Webster Co.	12.1	15.0	3.4	4.0	4.7	5.5	5.6
4	Blue Seal All-Mash Egg Ration	11.9	14.5	3.0	4.0	4.6	6.5	5.2
4	Blue Seal All-Mash Growing Ration	10.3	20.0	4.4	4.0	6.5	6.5	9.6
1	Blue Seal Breeders Laying Mash Pellets	12.4	13.8	3.2	3.0	7.9	12.0	5.0
1	Blue Seal Calf Ration	10.5	18.2	3.5	4.0	4.3	5.0	8.3
3	Blue Seal Chick Starter	11.3	19.0	3.8	4.0	4.8	6.5	6.5
1	Blue Seal "18" Dairy Ration	10.8	18.6	4.5	4.0	7.9	9.0	6.4
4	Blue Seal Egg Mash	11.3	19.4	3.6	4.0	51.8	9.0	6.5
1	Blue Seal Egg Mash	10.1	18.0	4.0	3.5	50.5	6.5	9.4
2	Blue Seal Fitting Ration	11.5	22.5	4.0	3.5	49.4	6.5	7.7
4	Blue Seal Growing Mash	10.9	15.2	3.9	4.0	59.7	9.0	5.7
3	Blue Seal Pig Feed	11.5	19.5	3.5	4.0	51.4	7.0	8.9
3	Blue Seal Richmond 16 Dairy Ration	11.3	16.9	4.1	4.0	54.1	6.0	7.7
1	Blue Seal Richmond 16 Dairy Ration	10.2	16.3	3.1	3.0	55.4	7.1	4.3
2	Blue Seal "16" Dairy Ration	11.7	16.0	3.7	4.0	58.9	10.0	4.9
2	Blue Seal "16" Dairy Ration	11.7	16.0	3.9	4.0	51.2	9.0	5.0
2	Blue Seal Stock Feed	10.9	17.5	3.9	3.0	7.4	9.0	5.4
1	Blue Seal Succulent Feed	10.9	10.4	3.0	3.0	57.9	12.4	5.4
1	Blue Seal Succulent Feed	11.7	11.7	2.3	1.5	13.9	18.0	7.1
1	West-Nesbitt, Inc.	11.1	20.1	3.6	3.0	6.1	9.0	5.6
1	Pure Feed Egg Maker							
2	Est. M. G. Williams	11.7	18.8	3.7	4.0	6.3	10.0	9.4
1	Balanced Ration	10.4	20.0	4.1	4.0	4.7	7.0	9.5
1	Chick Starter	11.5	21.3	3.4	4.0	4.8	7.0	7.8
2	Growing Mash	11.3	20.1	3.8	4.0	5.0	7.0	8.2
1	Laying Mash							
1	Stanley Wood Gain Co.	11.9	20.6	4.0	5.0	7.2	10.0	5.7
2	Bliss Dairy Ration	12.3	17.9	3.5	4.0	4.7	5.0	3.6
2	Preferred Complete Growing Ration	11.8	15.0	3.2	4.0	5.3	5.0	5.3
2	Preferred Complete Laying Ration	11.8	17.2	3.2	4.5	5.7	5.0	7.0
1	Preferred Growing Feed	11.5	17.9	3.7	4.5	5.3	6.0	7.0
1	Preferred Laying Mash	11.5	20.0	4.4	4.5	5.0	7.0	8.8
1	Preferred Starting Mash	10.5	20.2	4.5	4.0	6.8	5.0	7.7
2	Dairy Ration	11.2	19.1	4.4	5.0	7.7	10.0	4.6

Alfalfa Products

For several years a greater proportion of alfalfa meals have failed to meet guarantees than any other feed ingredient. In many instances there has been no relation between minimum protein and maximum fiber guarantees and actual content. It is generally believed that a satisfactory grade of alfalfa meal or leaf meal should carry at least 50 parts per million of carotene. Just how far certain brands have deviated, a study of the tables will indicate. Weather and other conditions have contributed to depressed production. The insistence of some feed mixers on having something that could be called alfalfa regardless of quality has led to the utilization of some products that added nothing to the feed but bulk and the mixtures would have been fully as satisfactory without them.

Alfalfa Products

Manufacturer and Brand	Water %	Protein		Fat		Nitrogen Free Extract %	Fiber		Ash %	Carotene Parts per Million	Riboflavin Parts per Million
		Found %	Guar- anteed %	Found %	Guar- anteed %		Found %	Guar- anteed %			
A. B. Caple Co., Toledo, Ohio 17% Capex Dehydrated Alfalfa Meal	7.9	14.7	17.0	2.4	2.0	37.9	29.7	27.0	7.4	91	11.7
	10.1	17.3	17.0	2.6	2.0	37.9	21.9	27.0	10.2	46	21.0
Cooperative Alfalfa Mills, Inc., Toledo, Ohio Dehydrated Alfalfa Meal 17	8.6	10.1	17.0	2.4	1.5	41.7	30.1	28.0	7.1	82	8.0
	11.4	14.2	17.0	1.7	1.5	35.0	30.3	30.0	7.4	25	10.9
	11.6	12.0	17.0	1.9	1.5	35.8	32.1	28.0	6.6	20	11.2
	9.1	11.1	15.0	1.3	1.5	37.3	35.1	32.0	6.1	11	8.5
Denver Alfalfa Milling & Products Co., Lamar, Col. Jack Rabbit Dehydrated Alfalfa Meal 17%	3.1	19.3	17.0	2.4	1.5	39.0	26.1	27.0	10.1	125	20.8
	6.4	12.7	17.0	2.0	2.0	39.5	31.2	30.0	8.2	45	10.6
Keystone Dehydrating Co., Nazareth, Penn. Super-Green Dehydrated Alfalfa Meal	3.4	15.2	17.0	1.7	2.0	37.4	35.9	30.0	6.4	9	11.3
	8.1	13.5	13.0	1.6	2.0	36.4	33.0	30.0	7.4	19	12.3
	2.5	11.8	13.0	1.7	2.0	40.0	37.8	35.0	6.4	12	6.9
	6.7	12.6	17.0	2.6	1.5	44.6	24.2	30.0	9.3	75	12.3
Neumont Co., St. Louis, Mo. 20% Dehydrated Alfalfa Leaf Meal	5.4	18.3	20.0	3.2	2.5	42.3	22.9	18.0	7.9	69	14.2
	6.7	13.3	17.0	2.0	1.5	38.3	34.0	28.0	5.7	37	13.6
Rush County Alfalfa Dehydrating Coop., Inc. Kushville, Ind. Alfalfa Meal	8.1	17.7	20.0	1.8	1.5	31.5	13.6	18.0	27.3	35	17.6
	9.6	11.1	17.0	2.0	1.5	37.1	33.0	28.0	7.2	13	10.2
Saunders Mills, Inc., Toledo, Ohio Velvet Brand Leaf Alfalfa Meal 20	10.7	15.5	17.0	1.7	1.5	35.7	26.4	30.0	10.0	14	13.7
	9.4	11.4	15.0	1.6	1.5	36.8	34.5	32.0	6.3	15	12.8

Alfalfa Products—Concluded

Manufacturer and Brand	Water %	Protein		Fat		Nitrogen Free Extract %	Fiber		Ash %	Carotene Parts per Million	Riboflavin Parts per Million
		Found %	Guar- anteed %	Found %	Guar- anteed %		Found %	Guar- anteed %			
Schoenck Farms, Inc., Nazareth, Penn.											
Super-Green Dehydrated Alfalfa Meal	6.7	16.6	17.0	3.1	2.0	38.5	27.0	25.0	8.1	104	11.7
Super-Green Dehydrated Alfalfa Meal	5.2	17.3	17.0	3.3	2.0	43.1	23.0	25.0	8.1	150	13.1
Super-Green Dehydrated Alfalfa Meal	5.6	18.3	17.0	3.5	2.0	43.1	21.3	25.0	8.2	115	18.7
Super-Green Dehydrated Alfalfa Meal	6.0	17.2	17.0	2.3	2.0	39.0	25.8	25.0	9.7	57	13.1
Super-Green Dehydrated Alfalfa Meal	6.2	17.1	17.0	2.4	2.0	37.8	27.6	25.0	8.9	74	12.4
Super-Green Dehydrated Alfalfa Meal	1.8	18.7	17.0	3.5	2.0	45.6	20.3	25.0	10.1	206	22.0
Super-Green Dehydrated Alfalfa Meal	6.8	17.5	17.0	2.1	2.0	39.9	28.3	25.0	8.7	83	21.0
Super-Green Dehydrated Alfalfa Meal	6.6	15.6	17.0	2.5	2.0	37.6	28.3	25.0	9.4	70	17.8
Super-Green Dehydrated Alfalfa Meal	5.0	17.8	17.0	3.0	2.0	42.4	25.0	25.0	6.8	146	14.7
W. J. Small Co., Inc., Neodesha, Kan.											
17% Dehydrated Alfalfa Meal	5.3	16.2	17.0	2.7	1.75	44.4	22.9	27.0	8.5	70	16.2

Phosphorus, Calcium, Manganese and Choline Content of Commercial Poultry Feeds

The mineral content of poultry mashes is, according to feeding experts, of considerable importance. Evidently some diversity of opinion as to proper amounts exists, as indicated by the variations between brands made by different manufacturers whose reputation for making satisfactory feeds is well established. Much of course depends upon the supplementary feeds advocated. It is obvious that a complete mash, whether it be for chicks or mature fowls, should have recognized and uniform levels irrespective of brand if such levels have been satisfactorily established and accepted.

As the choline content of poultry feeds has been of recent interest, it is reported in so far as there has been time to make the analyses.

Choline Content of Feed Ingredients

Number of Samples	Material	Choline %	Number of Samples	Material	Choline %
1	Dehydrated alfalfa meal . . .	0.08	3	Meat and bone meal,	
1	Dried beet pulp	0.10		45% protein	0.10
3	Cottonseed meal	0.27	2	Animal liver meal	0.38
2	Dry distillers grains	0.14	2	Ground oats	0.12
4	Fish meal	0.32	2	Feed oats	0.08
2	Shrimp meal	0.61	1	Oat feed	0.04
1	Starfish meal	0.35	4	Soy bean oil meal	0.28
1	Gluten meal	0.03	3	Wheat bran	0.12
2	Gluten feed	0.08	3	Standard wheat middlings	0.12
1	Hominy feed	0.07	1	Red dog flour middlings	0.11
1	Linseed meal	0.18	2	Dried whey	0.21
4	Meat scrap, 50% protein . . .	0.13	2	Dried whey solids	0.17

**Phosphorus -- Calcium -- Manganese -- Choline Content
of Commercial Poultry Feeds**

Manufacturer and Brand	Phosphorus %	Calcium %	Phosphorus Calcium Ratio	Manganese Parts per Million	Choline %
Allied Mills, Inc.					
Wayne All Mash Egg	0.52	1.31	1 - 2.5	159.3	—
Wayne Breeder Mash	0.69	1.55	1 - 2.2	46.8	—
Wayne Chick and Broiler Ration	0.67	1.39	1 - 2.1	83.3	—
Arcady Farms Milling Co.					
Egg and Breeder Mash	0.76	1.90	1 - 2.5	116.4	—
Beacon Milling Co., Inc.					
Battery Growing Ration	0.89	1.90	1 - 2.1	82.5	—
Battery Laying Mash	0.71	1.15	1 - 1.6	82.0	—
Fleshing Pellets	0.96	2.05	1 - 2.1	121.5	—
Borden Crain Co.					
Laying Mash	0.81	1.98	1 - 2.4	128.0	0.09
Community Service, Inc.					
Poultry Mash	0.64	0.53	1 - 0.8	29.3	0.11
Starter and Grower Mash	0.83	2.15	1 - 2.6	79.4	0.11
Courcy Grain Co.					
Eastern Milk Laying Mash	0.87	2.81	1 - 3.2	163.2	0.08
Chas. M. Cox Co.					
Wirthmore Complete Breeder Pellets	0.74	1.45	1 - 2.0	70.4	0.11
Wirthmore Complete Egg Ration	0.62	1.37	1 - 2.2	71.7	0.12
Wirthmore Complete Growing Ration	0.69	1.34	1 - 1.9	—	0.11
Wirthmore Laying Mash Pellets	0.92	1.66	1 - 1.8	43.8	0.10
Wirthmore Starter and Broiler Ration	0.87	1.98	1 - 2.3	55.0	—
Wirthmore Turkey Stating Ration	0.70	1.77	1 - 2.5	83.1	0.16
Wirthmore Turkey Growing Ration	0.97	1.97	1 - 2.0	68.2	0.15
Wirthmore Turkey Growing Ration	0.81	2.30	1 - 2.8	45.6	—
Dailey Mills, Inc.					
Egg Producer Mash	0.64	1.65	1 - 2.6	55.5	—
Emergency Mash	0.55	1.38	1 - 2.5	66.2	—
Super Laying Mash	0.65	1.49	1 - 2.3	58.3	—
Super Hatch Producer	0.55	1.75	1 - 3.2	75.5	0.11
Eastern States Farmers' Exchange					
All Mash Developer	0.74	1.26	1 - 1.7	—	0.11
All Mash Egg	0.82	1.93	1 - 2.4	110.0	0.14
Egg Mash	1.08	2.24	1 - 2.1	56.0	0.11
Elmore Milling Co., Inc.					
Complete Market Egg Mash	0.72	1.86	1 - 2.6	—	0.11
Complete Market Egg Mash	0.57	1.47	1 - 2.6	98.0	—
Complete Starter-Broiler	0.72	1.62	1 - 2.3	56.6	—
Egg Mash	0.74	1.68	1 - 2.3	42.8	—
Growing Mash	0.82	1.45	1 - 1.8	93.5	—
Turkey Growing Mash	0.93	2.08	1 - 2.2	72.8	0.15
Turkey Growing Mash	0.53	1.78	1 - 3.4	94.7	—
George A. Fair					
Fair Square Growing Mash	0.82	2.69	1 - 3.3	81.6	—
Fair Square Starting & Growing Mash	0.66	2.63	1 - 4.0	52.5	—
Flory Milling Co., Inc.					
All-Mash Egg and Breeder Ration	0.90	1.60	1 - 1.8	90.8	—
Egg and Breeder Mash Pellets	0.99	2.60	1 - 2.6	124.0	—
16% Growing Mash	1.15	2.42	1 - 2.1	97.4	—
Fred A. Fountain					
Laying Mash	0.80	1.48	1 - 1.9	77.4	—
Starter and Broiler Ration	0.71	1.45	1 - 2.0	31.3	—
J. B. Garland & Son, Inc.					
Complete Starting and Broiler Ration	0.73	1.74	1 - 2.4	104.7	0.08
Growing Mash with Cod Liver Oil	0.57	1.19	1 - 2.1	80.0	0.08
Laying Mash with Cod Liver Oil	0.59	0.87	1 - 1.5	62.5	0.08
General Mills, Inc., Larowe Division					
Larowe Chick Builder	0.80	1.50	1 - 1.9	96.4	—
Larowe Egg Mash	0.71	1.47	1 - 2.1	96.5	0.08

**Phosphorus -- Calcium -- Manganese -- Choline Content
of Commercial Poultry Feeds - Concluded**

Manufacturer and Brand	Phos- phorus %	Calc- ium %	Phosphorus Calcium Ratio	Manganese Parts per Million	Choline %
D. H. Grandin Milling Co.					
Breeder Mash	1 21	2 79	1 - 2 3	80 5	—
Emergency Poultry Mash	0 91	2 10	1 - 2 3	75 0	—
Emergency Poultry Mash	0 72	1 82	1 - 2 5	74 8	—
Growing Mash	0 89	2 71	1 - 3 0	80 6	—
Start to Finish Mash	0 95	2 20	1 - 2 3	67 0	—
Start to Finish Mash	0 79	1 82	1 - 2 3	70 0	—
Turkey Grower	0 92	2 26	1 - 2 5	105 3	—
Hales & Hunter Co.					
Red Comb Breeder Mash	0 79	2 30	1 - 2 9	82 9	—
Red Comb Broiler Mash	0 65	1 19	1 - 1 8	96 4	—
Red Comb Chick Starter	0 70	1 13	1 - 1 6	89 5	—
Red Comb Egg Mash	0 72	2 09	1 - 2 9	77 6	—
D. Harbeck & Sons					
Crusader All Purpose Mash	0 86	1 62	1 - 1 9	68 0	—
Welcome Growing Mash	0 83	1 64	1 - 2 0	75 6	—
Welcome Starter and Broiler Mash	0 93	1 76	1 - 1 9	61 2	—
Mansfield Milling Co.					
Chick Growing Ration	0 65	1 70	1 - 2 6	45 0	—
Dry Poultry Mash	0 80	1 62	1 - 2 0	69 2	—
Geo. Q. Moon & Co., Inc.					
Complete Laying Ration	0 75	1 81	1 - 2 4	41 1	0 11
Complete Starter and Broiler Mash	0 67	1 30	1 - 1 9	45 9	0 13
Special A Laying Mash	0 71	1 78	1 - 2 5	50 2	0 12
Park & Pollard Co.					
Growing Feed	0 52	1 50	1 - 2 9	144 7	0 15
Lay or Bust Dry Mash	0 55	1 66	1 - 3 0	146 9	0 13
Layer and Breeder Pellets	0 53	1 10	1 - 2 1	127 2	0 11
Starter and Broiler Mash	0 53	0 58	1 - 1 1	139 6	0 12
Quaker Oats Co.					
Ful-O-Pep Laying Mash	0 73	0 68	1 - 0 9	32 0	—
Ralston Purina Co.					
Eggena (Complete Ration)	0 66	2 08	1 - 3 2	107 0	0 13
Turkey Fatena Checkers	0 45	0 77	1 - 1 7	94 0	0 10
Arthur Ventura Grain Co.					
Laying Mash	0 69	1 36	1 - 2 0	55 0	—
O. B. Vunck & Co.					
Cortland Growing Mash	0 70	1 27	1 - 1 8	48 1	—
Cortland Laying Mash	0 81	2 38	1 - 2 9	53 1	—
Cortland Starting and Growing Mash	0 74	1 72	1 - 2 3	48 2	—
Wayne County Grangers Feed Corp.					
Superior Laying Mash	0 55	0 46	1 - 0 8	53 5	—
H. K. Webster Co.					
Blue Seal All Mash Egg Ration	0 72	1 32	1 - 1 8	55 0	—
Blue Seal Chick Starter	0 63	1 22	1 - 1 9	70 0	—
Blue Seal Egg Mash Pellets	0 76	1 65	1 - 2 2	78 0	—
Blue Seal Growing Mash	0 79	1 99	1 - 2 5	88 1	—
Blue Seal Growing Mash	0 93	2 47	1 - 2 7	83 7	—
West-Neshift Inc.					
Pure Feed Egg Maker	0 61	1 05	1 - 1 7	52 1	0 08
Est. M. G. Williams					
Chick Starter	0 93	2 18	1 - 2 3	102 5	0 12
Growing Mash	0 81	2 04	1 - 2 5	105 0	0 10
Laying Mash	0 79	2 31	1 - 2 9	122 4	0 10

Animal and Fish Products

MANUFACTURER AND BRAND

Consolidated Rendering Co.

Corenco 45% Meat and Bone Scrap
 Corenco 45% Meat and Bone Scrap
 Corenco Cod and Haddock Meal
 Corenco Cod and Haddock Meal
 Corenco Fish Meal

Gorton-Pew Fisheries Co., Ltd.

Gorton's Red Fish Meal

Maine Fish Meal Co.

Maine Vitamin D Concentrate
 Maine Vitamin D Concentrate
 Maine Vitamin D Concentrate

Jas. F. Morse & Co.

Morse's 50% Meat and Bone Scraps

John Reardon & Sons Division of Wilson & Co., Inc.

Register Brand 55% Protein Meat Scrap
 Register Brand 55% Protein Meat Scrap
 Register Brand 50% Protein Meat and Bone Scrap
 Register Brand 50% Protein Meat and Bone Scrap
 Register Brand 50% Protein Meat and Bone Scrap
 Register Brand 45% Protein Meat and Bone Scrap
 Register Brand 45% Protein Meat and Bone Scrap
 Register Brand Fish Meal
 Register Brand Fish Meal
 Register Brand Fish Meal
 Rearco Animal Liver Meal

	Water		Protein		Fat		Ash	Oleic Acid	Protein Quality Index
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed			
	6.9	43.1	45.0	6.0	8.4	6.0	40.2	0.35	72.4
	6.4	45.7	45.0	6.0	11.0	6.0	34.8	0.85	69.9
	10.0	60.1	60.0	5.0	8.9	5.0	21.8	2.60	59.6
	13.9	60.0	60.0	8.7	8.7	5.0	19.6	1.45	64.1
	8.2	52.0	55.0	4.0	18.6	4.0	20.9	2.40	59.3
	4.3	57.7	55.0	5.0	8.5	5.0	28.6	0.56	75.7
	10.4	52.0	50.0	10.0	17.9	10.0	17.5	1.20	73.5
	8.6	50.3	50.0	10.0	21.3	10.0	18.4	1.41	70.0
	9.9	52.3	50.0	10.0	20.0	10.0	17.5	1.41	67.4
	7.1	54.1	50.0	8.0	10.9	8.0	26.4	1.06	65.4
	5.3	53.8	55.0	6.0	11.0	6.0	29.3	1.10	64.3
	7.5	54.2	55.0	10.7	10.7	8.0	25.8	2.54	69.0
	6.8	52.4	50.0	10.7	10.7	8.0	28.6	1.48	68.8
	6.1	52.1	50.0	11.4	11.4	8.0	28.8	1.41	70.7
	4.7	53.0	50.0	15.5	15.5	8.0	24.2	3.38	59.8
	4.8	44.3	45.0	13.2	13.2	8.0	34.5	1.83	66.0
	5.2	44.2	45.0	15.4	15.4	8.0	32.2	2.12	72.3
	7.2	57.8	60.0	9.9	9.9	5.0	24.1	0.63	76.1
	6.1	60.3	60.0	11.2	11.2	5.0	21.7	0.92	67.5
	11.1	61.3	60.0	8.2	8.2	5.0	19.8	1.97	64.1
	8.0	65.9	65.0	13.4	13.4	5.0	8.0	6.20	69.7

Animal and Fish Products

Owing to scarcity and consequent restrictions upon the sale and use of fish and meat scrap, a smaller number of these products was found. The oleic acid content, an indication of decomposition or the condition of the scrap before rendering, did not average materially different from preceding years. It is possible to make scrap from sound stock which does not carry over 1.0 percent of oleic acid, which is the standard of some feed mixers in selecting scrap as an ingredient of feeds. It is quite possible that some material used would under normal conditions have been made into fertilizer tankage.

The protein quality index is determined by methods worked out by H. J. Almquist* of the University of California. The purpose of the method is to break up and determine the different components of what is analyzed as total protein and to assign to these components their proper value in promoting growth. Check tests made with chicks have proved the general accuracy of the method. Experiments indicate that a meat and bone scrap of excellent quality should have an index value of 70 to 75, one of good quality 65 to 70, and one of average quality 60 to 65. A product with an index value of less than 55 may be considered low quality. Fish meal of highest grade may run as high as 80 to 87. Fish meal produced from market scrap may run as low as 58.

The protein quality index found is not particularly disturbing. While some lots could have been of better quality, in the light of present shortages the samples with few exceptions should be considered acceptable.

Products Usually Sold as Vitamin Supplements

With the exception of dried milk and dried whey, the products listed in this table are added to rations primarily for the vitamins they furnish. It should be understood that, although *riboflavin and, in some instances, choline and carotene are the only substances reported, they are not necessarily the only valuable constituents of the products in question*, many of which contain other vitamins or minerals as well. Our examination was confined to those values that can be determined by chemical methods.

*Supplementary Values of Animal Protein Concentrates in Chick Rations: Journal of Animal Nutrition, Volume 10, July-December 1935.

Partial Assay of Various Products Usually Sold as Vitamin Supplements

Manufacturer and Brand	Protein		Fat		Fiber		Riboflavin Parts per Million	Carotene Parts per Million	Choline %
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed			
Atlantic Supply Co., Baltimore, Md. Di-Gra-Sol Fermentation By-Products	26.8	20.0	4.8	6.0	11.0	13.0	12.9	—	—
Borden Co., New York, N. Y. Flaydry	26.7	24.0	1.8	0.5	4.7	4.25	16.0	—	0.20
Flaydry	28.6	24.0	2.6	0.5	3.4	4.25	22.0	—	0.16
Flaydry	27.5	24.0	2.7	0.5	3.4	4.25	17.5	—	0.17
Ration-ayd 85	31.9	32.0	7.8	0.5	2.9	4.25	11.1	—	—
Ration-ayd 100	32.7	32.0	7.2	0.5	3.4	4.25	9.6	—	—
Ladpro 100 A - 40 D Poultry Feed Supplement	45.5	45.0	7.4	3.0	3.4	5.0	12.5	—	—
Ladpro 100 A - 40 D Poultry Feed Supplement	45.2	45.0	7.7	3.0	4.6	5.0	5.4	—	0.36
Canton Dairies Coop. Inc., Canton, N. Y. Dried Skim Milk Powder	32.6	32.0	0.7	0.5	—	—	19.3	—	—
Commercial Solvents Corp., Peoria, Ill. B-Y Riboflavin Supplement	35.1	—	8.0	—	3.3	—	290.0	—	—
B-43 Riboflavin Supplement	14.8	15.0	6.0	5.0	4.9	6.0	137.0	—	—
Dawes Products Co., Chicago, Ill. Flavonine	33.7	31.0	2.8	3.0	3.5	6.5	24.0	—	0.12
Dawes Vitamek Base	24.4	23.0	2.0	3.0	3.4	6.0	31.5	—	0.17
Dawes Vitamek Base	24.5	23.0	4.2	3.0	3.0	6.0	23.8	—	0.18
Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass. Gorton's Al-Fish Blend	42.5	40.0	7.9	5.5	7.9	8.0	33.0	27.0	—
Gorton's Al-Fish Blend	43.1	40.0	7.9	5.5	7.8	6.0	24.0	27.0	0.21
Gorton's Al-Fish Blend	41.2	40.0	7.8	5.5	9.3	8.0	33.7	25.0	0.21
Gorton's Al-Fish Blend	41.9	40.0	8.1	5.5	8.8	6.0	25.9	18.0	0.28
National Distillers Products Corp., New York, N. Y. Prodi-lac Brand Dried Distillers' Grains with Solubles	32.8	27.0	4.8	6.0	11.0	9.0	10.7	—	0.37
Prodi-lac Brand Dried Distillers' Grains with Solubles	31.2	27.0	5.0	8.0	9.5	9.0	12.9	—	0.35
Prodi-lac Brand Dried Distillers' Grains with Solubles	31.9	27.0	5.3	8.0	9.1	9.0	17.8	—	—
Prodi-lac Brand Dried Distillers' Grains with Solubles	31.2	27.0	4.9	8.0	10.1	9.0	10.0	—	0.41

P. Fred'k Obrecht & Son, Baltimore, Md.Egg-O-Milk Co.'s Blend
Egg-O-Milk Co.'s Blend32.5
33.532.0
32.02.5
2.11.5
1.52.4
1.34.0
4.05.4
5.00.23
0.20**J. T. Sexton Co., Kansas City, Mo.**

Ribo-Mix

30.7

31.0

2.1

2.5

2.6

2.5

40.0

Standard Brands, Inc., New York, N. Y.

Pilschman's Irradiated Pure Dried Yeast Type 18 C

51.1

—

1.2

—

—

—

42.0

Whitmoyer Laboratories, Inc., Myerstown, Penn.

E-B Vitamin Concentrate

27.7

27.0

8.1

8.0

2.8

3.5

125.5

0.19

E-B Vitamin Concentrate

28.8

27.0

8.2

8.0

2.8

3.5

107.0

0.31

E-B Vitamin Concentrate

27.4

27.0

8.0

8.0

2.9

3.5

116.0

Western Condensing Co., San Francisco, Calif.

Peebles Lacto-G Dried Whey

11.6

12.0

0.9

0.5

—

—

20.8

0.19

Peebles Whey Solids

14.0

14.0

1.0

0.5

—

—

26.0

0.18

Peebles Whey Solids

13.7

14.0

0.9

0.5

—

—

22.8

0.15

Directory of Manufacturers Who Registered Feeding Stuffs for Sale in Massachusetts in 1944

- Aberjona Packing Division, Blue Points Co., Inc., New Boston St., Woburn, Mass.
 Aberts Milling Co., Seattle, Wash.
 E. T. Allen Co., Atlanta, Ga.
 Allied Mills, Inc., Chicago, Ill.
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.
 A. P. Ames & Co., 10 Walnut St., Peabody, Mass.
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.
 Archer-Daniels-Midland Co., Minneapolis 2, Minn.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
 W. E. Atkinson Co., 27 Water St., Newburyport, Mass.
 Atlantic Supply Co., Baltimore, Md.
 E. W. Bailey & Co., Montpelier, Vt.
 Barber & Bennett, Inc., Albany, N. Y.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Foods, Inc., 237 Main St., Buffalo, N. Y.
 Bisbee Linseed Co., Inc., Amsterdam, N. Y.
 Bisbee Linseed Co., 2100 Lincoln-Liberty Bldg., Philadelphia, Penn.
 Blaine-Mackay-Lee Co., North East, Penn.
 Blatchford Cali Meal Co., Waukegan, Ill.
 Blatchley & Ballard, Inc., 153 Russell St., Middletown, Conn.
 Borden Co., Special Products Div., 350 Madison Ave., New York, N. Y.
 Borden Grain Co., West Water St., Taunton, Mass.
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Company of North America)
 George B. Brown Corp., Ipswich, Mass.
 Buckeye Cotton Oil Co., Cincinnati, Ohio
 A. B. Caple Co., Toledo 5, Ohio
 Central Soya Co., Inc., Fort Wayne, Ind.
 Checkerboard Feed Stores, Ralston Purina Co., Prop., St. Louis, Mo.
 Clinton Co., Clinton, Iowa
 Coatsworth and Cooper, Ltd., 67 Yonge St., Toronto, Ont., Canada
 Commander-Larabee Milling Co., Minneapolis, Minn.
 Community Service, Inc., Canaan, Conn.
 Consolidated Products Co., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Continental Distilling Corp., 1429 Walnut St., Philadelphia 2, Penn.
 O. A. Cooper Co., Humboldt, Neb.
 Coin Products Sales Co., 17 Battery Place, New York 4, N. Y.
 Courcy Grain Co., 12 Waverly St., Taunton, Mass.
 Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
 Chas. M. Cox., 177 Milk St., Boston, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
 Curley Grain & Fuel Co., 563 Main St., Wakefield, Mass.
 Dailey Mills, Inc., Binghamton, N. Y.
 Dairy Farmers' Union Feeds, Plattsburgh, N. Y.
 Decatur Milling Co., Inc., Decatur, Ill.
 Dehydrating Process Co., 60 Mt. Washington Ave., Boston, Mass.
 Delaware Mills, Inc., Deposit, N. Y.
 Denver Alfalfa Milling & Products Co., Lamar, Col.
 Frank Diunto, 87 Warren St., Randolph, Mass.
 F. Diehl & Son, Inc., Wellesley 81, Mass.
 Dietrich & Gambrell, Inc., Frederick, Md.
 Drackett Products Co., 5020 Spring Grove Ave., Cincinnati, Ohio
 E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.
 Eagle Roller Mill Co., New Ulm, Minn.
 East Bridgewater Farmer's Exchange, Inc., East Bridgewater, Mass.
 Eastern States Farmers' Exchange, West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago, Ill.
 Economy Grocery Stores Corp., 393 D. St., Boston, Mass.
 Egg-O-Milk Co., Baltimore, Md. (Registered by P. Fred'k Obrecht & Son)
 M. W. Ellis Estate, 19 Walnut St., Peabody, Mass.
 Elmore Milling Co., Inc., Oneonta, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Association, Topsfield, Mass.
 Evans Milling Co., Indianapolis, Ind.
 Excelsior Milling Co., Minneapolis, Minn.

- George A. Fair, Holliston, Mass.
 Farmers Feed Co., 532 East 76th St., New York, N. Y.
 Federal Mill, Inc., Lockport, N. Y.
 Finger Lakes and Hudson Flour Mills Inc., Geneva, N. Y.
 Finger Lakes & Hudson Flour Mills, Inc., 7 Madison St., Troy, N. Y.
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Flory Milling Co., Inc., Bangor, Penn.
 Fred A. Fountain, Taunton, Mass.
 J. B. Garland & Son, Inc., Worcester, Mass.
 General Foods Corporation, Corn Mill Division, Kankakee, Ill.
 General Mills, Inc., Minneapolis, Minn.
 General Mills, Inc., Farm Service Division, Fitchburg, Mass.
 General Mills, Inc., Larrowe Division, Box 68, North End Station, Detroit, Mich.
 Getek Industrial & Agricultural Supplies Corp., 1270 Sixth Ave., New York, N. Y.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Glidden Co., Feed Mill Division, 1160 West 4th St., Indianapolis, Ind.
 Glidden Co., Soya Products Division, 5165 West Moffat St., Chicago, Ill.
 Gloucester Dehydrating Process Co., Gloucester, Mass.
 Golden Eagle Milling Co., Petaluma, Cal. (Distributors for Western Condensing Co.)
 Goode Grain Co., 452 Broadway, Lowell, Mass.
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., New York, N. Y.
 Hales & Hunter Co., 166 West Jackson Blvd., Chicago 4, Ill.
 D. Harbeck & Sons, New Bedford, Mass.
 Henkel Flour Mills, Division of International Milling Co., 323 East Atwater St., Detroit 26, Mich.
 Hercules Powder Co., Dairy Products Division, 332 South Michigan Ave., Chicago, Ill.
 Hood Mills Co., Baltimore 5, Md.
 E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
 Horton Grain Co., Ipswich, Mass.
 Hubinger Co., Keokuk, Iowa
 Humphreys-Godwin Co., Memphis, Tenn.
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.
 International Milling Co., Minneapolis, Minn.
 Jaquith & Co., 305 Main St., Woburn, Mass.
 Kansas Flour Mills Co., 1000 New York Life Bldg., Kansas City, Mo.
 Kasco Mills, Inc., Waverly, N. Y.
 Kellogg Co., Battle Creek, Mich.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 King Midas Flour Mills, Division of Van Dusen Harrington Co., 500 Flour Exchange, Minneapolis, Minn.
 Kraft Cheese Co., 500 Peshtigo Ct., Chicago, Ill.
 Chas. A. Krause Milling Co., Milwaukee, Wis.
 Lake of the Woods Milling Co., Ltd., Montreal, Que., Canada
 Larabee Flour Mills Co., Kansas City, Mo.
 L. B. Lovitt & Co., Memphis 3, Tenn.
 A. S. MacDonald Commission Co., 177 Milk St., Boston 9, Mass.
 Mackenzie & Winslow, Inc., Fall River, Mass.
 Maine Fish Meal Co., Union Wharf, Portland, Maine
 Mansfield Milling Co., 1 Samoset Ave., Mansfield, Mass.
 Maritime Milling Co., Inc., Buffalo, N. Y.
 Meadow Brook Farms, Nazareth, Penn.
 Mellin's Food Co. of North America, 41 Central Wharf, Boston, Mass. (Registered for A. H. Brown & Bros.)
 Merrimack Farmers' Exchange, Inc., Concord, N. H.
 Middlesex County Farm Bureau Association, Waltham, Mass.
 Milkstone Concentrate Co., 1326 Baltimore Trust Bldg., Baltimore 2, Md.
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.
 Geo. Q. Moon & Co., Inc., Binghamton, N. Y.
 Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.
 National Distillers Products Corp., 120 Broadway, New York, N. Y.
 National Lead Co., 111 Broadway, New York 6, N. Y.
 National Milling Branch of National Biscuit Co., Toledo, Ohio
 Neumond Co., 300 Merchants Exchange, St. Louis, Mo.
 New England Grain Co., 390 Commercial St., Portland, Maine
 P. Fred'k Obrecht & Son, 4101 East Monument St., Baltimore 5, Md. (Registered for Egg-O-Milk Co.)

Ogden Grain Co., Utica, N. Y.
 Omar, Inc., Omaha 2, Neb.
 Oswego Soy Products Corp., East Seneca St., Oswego, N. Y.
 Palm Grain Co., 1081 Gorham St., Lowell, Mass.
 Park & Pollard Co., 356 Hertel Ave., Buffalo, N. Y.
 George H. Parker Grain Co., 56 Water St., Danvers, Mass.
 Parrish & Heimbecker, Limited, Toronto, Ont., Canada (Registered by A. S. MacDonald Commission Co.)
 Pasco Packing Association, Dade City, Florida
 Patent Cereals Co., Geneva, N. Y.
 Pierce Grain Corp., 1035 Seneca St., Buffalo, N. Y.
 Pillsbury Flour Mills Co., Minneapolis, Minn.
 Pittsburgh Plate Glass Co., Linseed Oil Division, 2-10 Chester Ave., Newark, N. J.
 W. N. Potter Grain Stores, Inc., Greenfield, Mass. (Registered by Chas. M. Cox Co.)
 Publicker Commercial Alcohol Co., 1429 Walnut St., Philadelphia 2, Penn.
 Quaker Oats Co., 141 West Jackson Blvd., Chicago 4, Ill.
 Ralston Purina Co., St. Louis, Mo.
 John Reardon & Sons Division of Wilson & Co., Inc., Cambridge, Mass.
 Rex Grain & Milling Co., Inc., 95 Kentucky St., Buffalo, N. Y.
 D. F. Riley, North Hatfield, Mass.
 Rio Grande Valley Citrus Exchange, Weslaco, Texas (Registered by Ashcraft-Wilkinson Co.)
 Rodney Milling Co., Kansas City 8, Mo.
 Russell-Miller Milling Co., Minneapolis, Minn.
 Rytlier & Warren Co., Belchertown, Mass.
 St. Lawrence Flour Mills Co., Ltd., 2110 Notre Dame St., West, Montreal, Que., Canada
 Saunders Mills, Inc., Toledo, Ohio
 Schenley Distilleries, Inc., 350 Fifth Ave., New York 1, N. Y.
 Schoeneck Farms, Inc., R. No. 3, Nazareth, Penn.
 Joseph E. Seagram & Sons, Inc., Louisville, Kentucky
 Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio
 W. J. Small Co., Inc., Neodesha, Kan.
 A. E. Staley Manufacturing Co., Decatur, Ill.
 Standard Milling Co., 309 West Jackson Blvd., Chicago, Ill.
 Stratton & Co., Concord, N. H.
 Swift & Company, Union Stock Yards, Chicago, Ill.
 Swift & Co., Palmer, Mass.
 Swift & Company Soybean Mills, Champaign, Ill.
 Toledo Soybean Products Co., Toledo, Ohio
 Jacob Trinley & Sons, Linfield, Penn.
 Union Sales Corporation, Columbus, Ind. (Distributor for Union Starch & Refining Co.)
 United Cooperative Farmers, Inc., Fitchburg, Mass.
 United Farmers Cooperative Creamery Assn., Inc., Charlestown, Mass.
 United Mills Co., Inc., Grafton, Ohio
 Unity Feeds, Inc., 177 Milk St., Boston, Mass.
 Arthur Ventura Grain Co., Longmeadow Road, Taunton, Mass.
 Vita-Vim Millers, 135 Scott St., Buffalo, N. Y.
 Wakefield Sawdust & Shavings Co., Wakefield, Mass.
 Hiram Walker & Sons, Inc., Foot of Edmund St., Peoria 1, Ill.
 C. P. Washburn Co., Middleboro, Mass.
 Wayne County Grangers Feed Corp., Clyde, N. Y.
 H. K. Webster Co., Lawrence, Mass.
 West-Nesbitt, Inc., Oneonta, N. Y.
 Western Condensing Co., Petaluma, Cal.
 Whitmoyer Laboratories, Inc., Myerstown, Penn.
 Williams Bros. Co., Kent, Ohio
 Est. M. G. Williams, Taunton, Mass.
 Wisconsin Milling Co., Menomonie, Wis.
 Stanley Wood Grain Co., Taunton, Mass.
 Worcester Grain & Coal Co., Worcester, Mass.

MASSACHUSETTS

AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 122

SEPTEMBER 1944

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventy-first report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1944

By Fertilizer Control Service Staff:

Philip H. Smith, *Official Chemist, in Charge*
 John W. Kuzmeski, *Senior Chemist*
 *H. Robert DeRose, *Assistant Chemist*
 Albert F. Spelman, *Assistant Chemist*
 C. Tyson Smith, *Assistant Chemist*
 *Leo V. Crowley, *Junior Chemist*

Henry B. Rodman, *Junior Chemist*
 James T. Howard, *Inspector*
 Louis A. Graves, *Inspector*
 Joseph Conklin, *Inspector*
 Joseph A. Martell, *Laboratory Assistant*
 Cora B. Grover, *Senior Clerk*

*On military leave of absence.

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PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesia.

Label must show:

 Net weight of fertilizer

 Name, brand or trade mark, and grade

 Name and address of manufacturer

 Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1.

Tonnage fee: 6 cents per ton of 2,000 pounds.

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

PHILIP H. SMITH
Massachusetts Agricultural Experiment Station
Amherst, Mass.

Manufacturers and Brands

Registrations have been perfected in Massachusetts during 1944 by 61 firms, covering 219 brands of mixed fertilizer and unmixed fertilizing materials.

The following brands were not found on display by the sampling agent at any point in the state and therefore do not appear in the tables of analyses.

Brands of Fertilizer Registered but Not Sampled

Allied Chemical & Dye Corp., The Barrell Division Sulphate of Ammonia (20.6-0-0)	Eastern States Farmers' Exchange—Cont. Eastern States 10-10-10-1 Eastern States Sulphate of Ammonia (20.5-0-0) Eastern States Sulphate of Potash (0-0-52)
American Agricultural Chemical Co. Agrico Alkaline 0-14-14 Agrico for Seeding 4-12-16 Muriate of Potash (0-0-60)	Thomas W. Emerson Co. Emseco Fertilizer 7-7-7
American Liquid Fertilizer Co., Inc. Liqua-Vita 6-9-7	Excell Laboratories New Plant Life 2-1-2
American Potash & Chemical Corp. Trona Muriate of Potash (0-0-60)	Humphreys-Godwin Co. Dixie Brand 41% Protein Prime Cottonseed Meal (6.58-0-0)
Apothecaries Hall Co. Liberty Fertilizer 4-12-4 Liberty Tobacco Mixture 5-3-5 Liberty Fertilizer (Sulphate Potash) 5-8-7 Castor Pomace (4.5-0-0) Muriate Potash (0-0-60)	International Minerals & Chemical Corp. International Sul-Po-Mag (Sulphate of Potash Magnesia)
Armour Fertilizer Works Armour's Big Crop Tobacco Special 5-3-5	L. B. Lovitt & Co. Lovit Brand 41% Protein Cottonseed Meal (6.56-0-0)
Alkins & Durhrow, Inc. OK Manure (2-1-1)	Middlesex County Farm Bureau Assn. Sulphate of Ammonia (20.5-0-0)
F. A. Bartlett Tree Expert Co. Bartlett Green Tree Food 4-8-6	Olds & Whipple, Inc. O & W 5-10-5 Fertilizer
Joseph Breck & Sons Corp. Breck's Ram's Head Sheep Manure (2-1-1)	Ruhm Phosphate & Chemical Co. Red Seal Brand Ruhm's Phosphate Rock (0-30-0)
Buell Fertilizer Co. Buell Peat-Poultry Manure (3-3-1.5)	Tennessee Corp. Es-Min-El
Eastern States Farmers' Exchange Eastern States 6-10-20-2 with Borax Eastern States 0-20-20-2 Eastern States 5-15-20-1	Woodruff Fertilizer Works Inc. Woodruff's 5-10-10 Fertilizer

Drawing of Samples

Between April 1 and June 15, three sampling agents made a thorough canvass of the state: Joseph Conklin in Hampshire, Hampden, Franklin, and Berkshire Counties; Louis A. Graves in Norfolk, Bristol, Plymouth, Barnstable, and Dukes Counties; and James T. Howard in Essex, Middlesex, Suffolk, and Worcester Counties. They visited 157 towns, took 1,098 samples, representing 187 brands, from stock in the possession of 335 agents or owners, and called at 353 places where no samples were drawn because the agency had been discontinued, the stock was all sold out, or sufficient samples had already been taken of the brands found. They sampled 16,375 sacks, representing 8,134 tons of fertilizer. One ton was sampled to every 9.2 tons sold in the state.

FERTILIZER TONNAGE

Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts

	July 1, 1941, to July 1, 1942	July 1, 1942, to July 1, 1943	July 1, 1943, to July 1, 1944
Mixed fertilizers	53,602	62,989 <i>b</i> .	61,390
Fertilizer chemicals and materials unmixed	15,470 <i>a</i> .	13,219 <i>c</i> .	11,648 <i>d</i> .
Pulverized animal manures	1,508	1,596	1,581
Totals	70,580	77,804	74,619

a. Does not include 1,604 tons of 18% superphosphate and 8,394 tons of 20% superphosphate distributed by the A.A.A.

b. Does not include 2,916 tons of 0-14-14 distributed by the A.A.A.

c. Does not include 8,505 tons of 20% superphosphate distributed by the A.A.A.

d. Does not include 15,218 tons of 20% superphosphate distributed by the A.A.A.

Tonnage of Mixed Fertilizers, July 1, 1943, to July 1, 1944

Grade*	Tonnage	Brands	Grade*	Tonnage	Brands
5-8-7	18,211	22	5-10-5	121	—
5-10-10	13,189	21	8-4-8	117	—
5-10-5	8,503	23	6-12-4	90	—
6-3-6	6,566	13	6-5-5	76	—
7-7-7	4,027	11	8-7-3	75	—
3-12-6	2,890	11	.08-16-10	72	—
8-16-16	1,832	—	6-15-15	70	—
5-17-0	945	—	4-8-4	46	—
4-12-4	847	—	4-16-20	46	—
4-9-7	829	—	3-12-3	40	—
8-16-8	406	—	4-8-6	40	—
6-10-4	361	—	3-10-5	31	—
0-14-14	353	—	3-10-3	25	—
6-8-2	338	—	5-8-5	14	—
8-8-8	337	—	0-20-20	13	—
4-10-10	328	—	5-7-4	10	—
5-3-5	309	—	Miscellaneous	38	—
3-8-7	195	—	Totals	61,390	148

* The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, July 1, 1943, to July 1, 1944

Material	Tonnage	Brands	Material	Tonnage	Brands
Nitrate of soda	3,203	—	Cottonseed meal	264	—
Superphosphate 20%	2,807	8	Cyanamid	203	—
Pulverized animal manures	1,581	22	Castor pomace	147	—
Superphosphate 18%	1,474	—	Uramon	138	—
Milorganite	1,108	—	Bone and tankage	70	—
Ammonium nitrate	689	—	Superphosphate 47%	32	—
Muriate of potash 60%	632	8	Tankage	11	—
Bone meal	526	8	Miscellaneous	39	—
Sulfate of ammonia	305	5	Totals	13,229	71

MIXED FERTILIZERS

Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than 1/4 Per Cent Below Guarantee	Between 1/4 and 1/2 Per Cent Below Guarantee	Between 1/2 and 3/4 Per Cent Below Guarantee	More than 3/4 Per Cent Below Guarantee
Acme Guano Co.	5	0	15	4	3	0	2
Agricultural Laboratories, Inc.	1	0	3	0	0	0	1
American Agricultural Chemical Co.	57	10	171	34	21	10	3
Apothecaries Hall Co.	21	17	62	4	0	0	0
Armour Fertilizer Works	30	11	90	22	2	0	0
Ernest J. Bantle	3	2	9	1	0	0	0
Belmont Gardens	1	1	3	0	0	0	0
Berkshire Chemical Co.	20	4	60	13	4	1	1
Joseph Breck & Sons Corp.	6	0	18	2	2	1	2
Consolidated Rendering Co.	45	14	135	24	4	10	3
Eastern States Farmers' Exchange	21	13	78	5	3	1	1
Thomas W. Emerson Co.	11	0	33	3	0	2	18
Essex County Co-operative Farming Association	6	3	20	4	1	0	0
H. L. Frost & Higgins Co.	1	0	3	1	0	0	0
Grasalo Co.	1	1	3	0	0	0	0
A. H. Hoffman, Inc.	2	0	6	1	1	0	0
Hydroponic Chemical Co., Inc.	3	2	9	0	0	1	0
Hy-Trous Corp.	2	2	6	0	0	0	0
International Minerals & Chemical Corporation	40	13	123	14	13	4	3
Kem-ical Corp.	1	1	3	0	0	0	0
National Plant Foods, Inc.	1	0	3	1	0	0	0
Old Deerfield Fertilizer Co., Inc.	16	14	50	1	1	0	0
Olds & Whipple, Inc.	12	11	36	1	0	0	0
Plantabbs Co.	2	2	6	0	0	0	0
Ra-Pid-Gro Corp.	1	0	3	0	0	0	1
Rogers & Hubbard Co.	31	28	91	2	1	0	0
William H. Rorer, Inc.	1	1	3	0	0	0	0
O. M. Scott & Sons Co.	7	0	21	4	1	3	4
Sears, Roebuck & Co.	2	1	6	0	2	0	0
Smith-Douglass Co., Inc.	44	8	115	21	11	2	7
Standard Wholesale Phosphate & Acid Works, Inc.	3	1	9	1	1	1	0
Swift & Company Fertilizer Works	9	7	27	1	1	0	0
Tennessee Corp.	3	2	9	1	0	0	0
C. P. Washburn Co.	4	0	12	3	1	0	0
Woodruff Fertilizer Works, Inc.	3	1	9	2	0	0	0
TOTALS	416	170	1,250	170	73	36	46

Serious Commercial Shortages in Mixed Fertilizers

Amount of Shortage per Ton	Number of Samples
More than \$5	9
Between \$4 and \$5	4
Between \$3 and \$4	4
Between \$2 and \$3	15
Between \$1 and \$2	39

Average Variation from Guaranteed Analysis

Seventeen firms have registered three or more brands of mixed fertilizers. On the basis of composition found by analysis as well as of tonnage sold, the following table shows to what extent each manufacturer was successful in avoiding deficiencies in plant food guarantees in his mixtures. Seven of the seventeen firms have an average deficiency in one or more plant food elements.

Manufacturer	Average Percentage of Plant Food Above or Below the Minimum Guarantee		
	Nitrogen	Available Phosphoric Acid	Water Soluble Potash
Acme Guano Co.	-.29	+	-.29
American Agricultural Chemical Co.	+	+	+
Apothecaries Hall Co.	+	+	+
Armour Fertilizer Works	+	+	+
Berkshire Chemical Co.	+	+	+
Consolidated Rendering Co.	+	-.01	+
Eastern States Farmers' Exchange	+	+	+
Thomas W. Emerson Co.	-.94	-1.04	+
Essex County Co-operative Farming Association	+	-.14	+
International Minerals & Chemical Corporation	+	+	+
Old Deerfield Fertilizer Co., Inc.	+	+	+
Olds & Whipple, Inc.	+	+	+
Rogers & Hubbard Co.	+	+	+
Smith-Douglass Co., Inc.	+	-.10	+
Standard Wholesale Phosphate & Acid Works, Inc.	-.005	+	-.02
Swift & Company Fertilizer Works	+	+	+
Woodruff Fertilizer Works, Inc.	+	+	-.05

Small Package Fertilizers

During the past few years, the sale of fertilizers packaged in small containers has increased greatly. Because the growers of household potted plants find the one-pound or smaller packages very convenient to use, a large percentage of the fertilizer sold in small lots is contained in packages of one pound or less. However, for small garden and lawn use, a considerable tonnage is also sold in ten-pound lots of solid fertilizer and one-gallon lots of liquid fertilizer.

Since these fertilizers carry different guarantees and are sold in packages that vary a great deal in size, weight, and price, it was thought that the consumer might be interested in the comparative costs of the three major elements in each brand. It is realized that some of the fertilizers, especially those intended for hydroponic use as well as for use on soil, are claimed to contain all elements essential for plant growth; however, since practically all of the other mixed fertilizers manufactured from ordinary commercial fertilizer ingredients also contain all of the elements known to be necessary for plant growth, a comparison based on the content of only the three elements, nitrogen, phosphoric acid, and

potash, is a fair one if the comparison is confined to fertilizers to be applied to soil. For hydroponic use, that is for growing plants in nutrient solutions or in sand, etc., it is advantageous to use mixtures made from chemically pure water-soluble ingredients. The cost of these ingredients is considerably higher than that of similar commercial-grade fertilizer materials ordinarily used in the manufacture of solid fertilizers. This higher cost of raw materials must naturally be reflected by a higher price on the mixed products.

Manufacturer and Brand	Grade	Weight of Package	Retail Package Price	Average Cost Per Pound of Plant Food
Agricultural Laboratories, Inc.				
Stim-U-Plant	4-12-8	260 grains	80 10	\$11 26
Stim-U-Plant	4-12-8	(3.70 pounds, 26,000 grains)	3 50	3 94
Thomas W. Emerson Co.				
Emseco Fertilizer	5-10-5	5 pounds	20	.20
A. H. Hoffman, Inc.				
Hoffman's Victory Garden Fertilizer	5-10-5	5 pounds	25	.25
Hydroponic Chemical Co., Inc.				
Hyponex	7-6-19	3 ounces	25	4 17
Hyponex	7-6-19	10 pounds	8 00	2 50
Hy-Trous Corporation				
Hy-Trous	4-8-4	3 fluid ounces	.25	7.99
Hy-Trous	4-8-4	(10.1 pounds, 1 gallon)	5 95	3 68
Kemical Corporation				
Kem-Liquid Plant Food . . . . .	.08-.16-.10	4 ounces	.10	117.64
Kem Liquid Plant Food . . . . .	.08-.16-.10	(8.44 pounds 1 gallon)	1 00	34 84
Mechling Bros. Chemicals, Division of General Chemical Co.				
Veget-Aid	5-10-5	1 pound	.15	.75
National Plant Foods, Inc.				
Hy-Gro Plant Food	13-26-13	3 ounces	25	2 61
Hy-Gro Plant Food	13-26-13	10 pounds	4 00	.77
F. G. Phillips Co.				
Ferti-Flora	3-3-3	8 ounces	.35	7.78
Plantabbs Co.				
Fulton's "V" Plantabbs	4-12-18	165 grains	10	12 44
Fulton's "V" Plantabbs	4-12-18	2 pounds	2 75	4 04
Ra-Pid-Gro Corporation				
Ra-Pid-Gro	23-27-17	1 pound	1 25	1 86
Ra-Pid-Gro	23-27-17	10 pounds	8 75	1 30
Rogers & Hubbard Co.				
Gro-Fast Plant Food	5-8-5	1 pound	10	.56
Gro-Fast Plant Food	5-8-5	5 pounds	.45	.50
William H. Rorer, Inc.				
Plant Dinner	5-7-5	6 ounces	.50	7.84
Plant Dinner	5-7-5	10 pounds	8 50	5 00
O. M. Scott & Sons Co.				
Scotts Garden Builder	5-10-5	10 pounds	.75	.37
Scotts Turf Builder	8-7-3	10 pounds	1 25	.69
Swift & Company Fertilizer Works				
Vigoro	4-12-4	1 pound	.10	.50
Vigoro	4-12-4	10 pounds	80	.40
Tennessee Corporation				
Loma	5-10-5	10 pounds	.85	.42

For the smallest size packages intended almost solely for use on small lots of potted plants, the total amount expended by any one individual is so small that the economic factor is hardly worth considering. In this case the convenience of handling a small package and the lack of odor or dust while applying the fertilizer to the plants probably far outweigh the extra cost, especially so far as most women are concerned. However, the amount spent for fertilizer for average outside garden use is large enough, especially if hydroponic fertilizer is purchased, to justify examination of the value the purchaser is getting for his money.

The preceding table lists the average price the consumer pays for each pound of plant food (nitrogen, phosphoric acid, and potash) in purchasing any of the brands listed. For example, in ten pounds of a 4-8-4 grade there are 4 tenths of a pound of nitrogen, 8 tenths of a pound of phosphoric acid, and 4 tenths of a pound of potash, or a total of 1.6 pounds of plant food, considering only the three major elements. If the ten pounds of fertilizer sells for \$1.00, the average cost per pound of actual plant food is 1.00 divided by 1.6, or 62.5 cents a pound. It may be said here that most of the minor elements are needed in such small quantities that their cost compared to that of the major elements is practically negligible.

Calculation of Shortages

For calculating the approximate commercial shortages per ton the following figures were used:

	Retail Cost Per Unit
Nitrogen:	
Water-soluble and synthetic organic.....	\$2.00
Water-insoluble of good quality and	
Water-soluble amounting to one-eighth of the percentage of	
water-insoluble nitrogen found when the percentage of	
water-insoluble nitrogen exceeds .50.....	8.00
Available phosphoric acid.....	1.40
Potash:	
Muriate.....	.85
Sulfate.....	1.10
From cotton hull and boll ashes and wood ashes.....	1.26

These values represent the average retail cost to the consumer of the plant food elements in *unmixed* materials. This does not include mixing and overhead costs which increase the retail cost of these elements in mixed goods.

To compensate for the increased unit cost in mixed goods the commercial shortage as found by using our values is multiplied by the factor: Actual retail selling price divided by our calculated guaranteed value.

Example: A 5-8-7 fertilizer selling for \$39.00 a ton analyzes:

Total nitrogen.....	4.67
Water-insoluble nitrogen.....	.88
Available phosphoric acid.....	7.43
Potash.....	7.13

Shortage: Nitrogen.....	$.33 \times \$2.00 = \0.66
Available phosphoric acid.....	$.57 \times 1.40 = .80$

Total.....	\$1.46

Our calculated guaranteed value:

Water-insoluble nitrogen.....	= .88 + .11 = .99	× \$8.00 =	\$7.92
Water-soluble nitrogen.....	= 5.00 - .99 = 4.01	× \$2.00 =	8.02
Available phosphoric acid.....	= 8.00	× \$1.40 =	11.20
Potash.....	= 7.00	× \$0.85 =	5.95
Total.....			\$33.09

Approximate commercial shortage = $39.00 \div 33.09 \times 1.46 = \1.72 per ton.

Explanation of Tables of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand", and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

From the Control Official's viewpoint, the amount of overrun, within reasonable limits, found in any sample of fertilizer is not especially significant. Of main importance is the fact that the particular sample analyzed shows that the manufacturer of the brand represented by the sample is selling a product which is or is not substantially as guaranteed. The manufacturer whose 4-9-7 brand is found by the Control Official to be running 4.01-9.03-7.02 in every sample of the brand tested is meeting all requirements covering this part of the fertilizer control laws as fully as the manufacturer of another 4-7-9 brand found to run 4.85-9.95-7.90 in each sample tested.

Therefore this table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of S1 or More Per Ton

Name of Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Where Sampled	Approximate Commercial Shortage Per Ton	Manufacturer's Settlement of Shortage
	Water Insoluble	Total					
Acme Guano Co.							
Acme 5-8-7 (a)	.35	4.67	8.88	6.85	New Bedford	\$1.17	Rebated
Acme 5-10-10	.12	4.80	10.59	8.90	Taunton	1.73	Rebated
Acme 5-10-10	.14	4.83	10.55	9.03	New Bedford	1.56	Rebated
Agricultural Laboratories, Inc.							
Stim-U-Plant 4-12-8	4.48	4.48	11.05	10.86	Brockton	- b.	-
American Agricultural Chemical Co.							
Agrico for Corn 3-12-6	.18	9.86	11.74	5.09	North Amherst	1.90	Rebated
Agrico for Corn 3-12-6	.15	3.20	11.30	6.10	Taunton	1.32	Rebated
Agrico for Corn 3-12-6	.32	3.05	11.31	6.09	Swausea	1.30	Rebated
Agrico for Corn 3-12-6 (a)	.36	2.74	11.41	5.77	Mansfield	2.35	Rebated
Agrico for Gardens (Victory Garden Fertilizer for Food Production Only)	.30	5.17	9.28	5.17	Oxford	2.14	Rebated
Agrico for Gardens (Victory Garden Fertilizer for Food Production Only)	.27	5.15	9.40	4.92	Mansfield	1.77	Rebated
Agrico for Gardens (Victory Garden Fertilizer for Food Production Only)	.28	5.12	9.53	4.79	Charlton	1.77	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.13	5.67	10.09	4.09	Leominster	1.68	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.18	5.24	10.25	4.59	Wareham	3.62	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.22	5.78	10.00	3.79	Waltham	1.45	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.11	5.38	10.26	4.37	Ilaverhill	2.28	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.15	5.43	10.27	4.65	Mansfield	3.10	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.13	5.63	10.28	4.21	Attleboro	2.01	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.14	5.54	10.22	4.09	Boston	2.50	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.14	5.59	10.03	4.17	Osterville	2.24	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.16	5.34	10.39	4.19	Osterville	2.34	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4	.15	5.37	10.56	3.90	Beverly	3.81	Rebated
Agrico for Lawns Trees & Shrubs 6-10-4 (a)	.15	5.53	10.57	4.19	Mattapoiset	2.56	Rebated

Agrico for Potatoes 5-10-10 (a)	.27	5.26	9.46	8.91	Hudson	\$2.20	Rebated
Agrico for Top Dressing 7-7-7 (a)	.17	6.51	7.26	6.62	Three Rivers	1.82	Rebated
Armour Fertilizer Works							
Armour's Big Crop 7-7-7 (a)	.27	6.63	7.42	7.65	Southbridge	1.21	Rebated
Armour's Victory Garden Fertilizer 5-10-5 (a)	.31	4.79	9.80	5.17	South Deerfield	1.56	Rebated
Berkshire Chemical Co.							
Berkshire Fertilizer 5-10-5	.19	5.45	9.48	4.99	North Amherst	1.06	Rebated
Berkshire Fertilizer 5-10-5 (a)	.18	5.11	8.79	6.35	Swansea	2.43	Rebated
Berkshire Victory Garden 5-10-5 (a)	.23	5.03	9.76	4.78	Southbridge	1.11	Rebated
Joseph Breck & Sons Corp.							
Breck's Victory Garden 5-10-5	.26	5.01	9.21	5.99	North Woburn	1.68	Rebated
Breck's Victory Garden 5-10-5 (a)	.27	5.03	9.40	5.72	Boston	2.23	Rebated
Brexone for Gardens & Lawns 5-10-4 (a)	3.08	5.17	5.76	3.80	Osterville	10.23	Rebated
Consolidated Rendering Co.							
Corenco 3-12-6 Animal Brand	.08	3.02	10.81	5.45	Fall River	2.85	Rebated
Corenco 3-12-6 Animal Brand	.09	3.50	11.42	6.19	Amherst	1.12	Rebated
Corenco 3-12-6 Animal Brand	.12	4.02	8.97	6.84	Wakefield	6.51	Rebated
Corenco 3-12-6 Animal Brand (a)	.16	3.05	11.27	6.47	Palmer	1.25	Rebated
Corenco 5-8-7 Potato and General Crop (a)	.06	5.01	7.36	7.77	Fall River	1.46	Rebated
Corenco 5-10-10 Peerless Potato	.10	4.39	9.38	7.39	Fall River	5.77	Rebated
Corenco 5-10-10 Peerless Potato	.22	4.89	9.27	9.86	So. Dartmouth	1.84	Rebated
Corenco 5-10-10 Peerless Potato	.10	4.92	9.42	9.97	New Bedford	1.33	Rebated
Corenco 5-10-10 Peerless Potato	.08	5.19	9.31	10.06	Taunton	1.29	Rebated
Corenco 5-10-10 Peerless Potato (a)	.09	4.95	9.32	10.17	Attleboro	1.27	Rebated
Eastern States Farmers' Exchange							
Eastern States 8-16-16 Low Chlorine, with .5% magnesium oxide (c)	.19	8.07	17.03	14.92	Cambridge	1.08	Rebated

a. See also table of "Mixtures substantially complying with guarantees."

c. Magnesium oxide found, 1.50%. Potash in forms other than inurate.

b. Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with other seriously deficient mixtures.

Mixtures Showing a Commercial Shortage of S1 or More Per Ton — Concluded

Name of Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Wheat Sampled	Approximate Commercial Shortage Per Ton	Manufacturer's Settlement of Shortage
	Water Insoluble	Total					
Thomas W. Emerson Co.							
Emseco Fertilizer 5-8-7	.21	4.31	6.92	7.69	Beverly	\$4.47	— c.
Emseco Fertilizer 5-8-7	.19	4.38	6.92	7.95	Beverly	4.25	— c.
Emseco Fertilizer 5-8-7	.21	4.09	7.21	7.34	Needham	4.52	— c.
Emseco Fertilizer 5-10-5	.20	3.84	8.95	5.31	Beverly	5.37	— c.
Emseco Fertilizer 5-10-5	.21	3.87	8.82	5.50	Beverly	5.53	— c.
Emseco Fertilizer 5-10-5	.22	3.70	8.81	5.54	Danvers	— b.	—
Emseco Fertilizer 5-10-5	.23	3.89	8.92	5.38	Beverly	— b.	—
Emseco Fertilizer 5-10-5	.25	3.67	8.56	6.08	Needham	— b.	—
Emseco Fertilizer 5-10-10	.22	3.32	8.43	12.68	Beverly	6.13	— c.
Emseco Fertilizer 5-10-10	.21	3.73	9.19	10.89	Beverly	5.08	— c.
Hydroponic Chemical Co., Inc.							
Hyponex 7-6-19 (a)	.07	6.44	7.06	19.30	Notwood	— b.	—
International Minerals & Chemical Corp.							
International 5-8-7 (a)	.17	5.14	7.45	7.17	Athol	1.21	Rebated
International 8-16-16	.11	7.81	15.86	15.26	North Woburn	1.43	Rebated
International 8-16-16 (a)	.34	7.56	14.98	14.57	Brockton	4.04	Rebated
International Victory Garden 5-10-5	.27	5.01	9.56	5.97	Greenfield	1.40	Rebated
International Victory Garden 5-10-5	.33	5.06	9.55	5.61	West Brookfield	1.42	Rebated
International Victory Garden 5-10-5	.29	5.14	9.43	5.47	Ayer	1.40	Rebated
International Victory Garden 5-10-5	.20	5.07	9.27	5.21	Taunton	1.55	Rebated
International Victory Garden 5-10-5	.38	5.08	9.65	6.53	Concord	1.11	Rebated
International Victory Garden 5-10-5	.19	5.00	9.19	5.21	New Bedford	1.71	Rebated
International Victory Garden 5-10-5 (a)	.26	4.85	9.68	5.50	Ware	1.18	Rebated
Ra-Pid-Gro Corp.							
Ra-Pid-Gro 23-21-17	—	21.87	23.92	8.84	Boston	— b.	—

O. M. Scott & Sons Co.

Scotts Garden Builder 5-10-5
 Scotts Garden Builder 5-10-5
 Scotts Garden Builder 5-10-5
 Scotts Turf Builder 8-7-3
 Scotts Turf Builder 8-7-3
 Scotts Turf Builder 8-7-3 (a)

Sears, Roebuck & Co.

Garden Master Victory Garden 5-10-5

Smith-Douglass Co., Inc.

Smith 0-14-14 Fertilizer
 Smith 0-14-14 Fertilizer
 Smith 0-14-14 Fertilizer (a)
 Smith 5-10-10 Fertilizer
 Smith 5-10-10 Fertilizer
 Smith 5-10-10 Fertilizer (a)

Standard Wholesale Phosphate & Acid Works, Inc.

Standard 5-10-10

.64	5.27	9.15	5.25	Worcester	— ^b	—
.86	4.58	11.20	4.39	New Bedford	\$2.78	Rebated
.77	5.26	9.49	4.82	Falmouth	1.88	Rebated
2.98	9.80	6.21	2.50	Worcester	— ^b	—
2.40	8.56	5.05	3.51	New Bedford	7.97	Rebated
2.40	8.58	5.68	2.83	Falmouth	5.37	Rebated
.21	4.55	10.78	4.67	New Bedford	2.49	Rebated
—	—	13.90	12.31	Shirley	1.74	Rebated
—	—	13.10	14.73	Bridgewater	1.35	Rebated
—	—	12.50	15.12	Wrentham	2.25	Rebated
.25	5.34	9.95	9.46	Gardner	1.71	Rebated
.21	6.56	7.81	9.66	Westboro	3.80	Rebated
.23	5.72	9.77	10.00	Westboro	1.32	Rebated
.18	4.40	11.41	9.51	Hudley	1.93	Rebated

a. See also table of "Mixtures substantially complying with guarantees."
 b. Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with other seriously deficient mixtures.
 c. Rebate pending.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Acme Guano Co.		
Acme 3-12-6	1	.20
Acme 5-8-7	1 a.	.23
American Agricultural Chemical Co.		
AA Quality Fertilizer 5-8-7	4	.18
Agrico for Corn 3-12-6	3 a	.19
Agrico for Gardens (Victory Garden Fertilizer for Food Production Only) 5-10-5	4 a.	.33
Agrico for Lawns Trees & Shrubs 6-10-4	5 a.	.23
Agrico for New England 5-8-7	8	.23
Agrico for Potatoes 5-10-10	6 a.	.28
Agrico for Tobacco 6-3-6	2 b.	3.56
Agrico for Top Dressing 7-7-7	5 a.	.21
Apothecaries Hall Co.		
Liberty Fertilizer 0-14-14	1	—
Liberty Fertilizer 3-12-6	3	.69
Liberty Fertilizer (Muriate Potash) 5-8-7	3	.56
Liberty Victory Garden Fertilizer 5-10-5	2	.57
Liberty Fertilizer (Muriate Potash) 5-10-10	3	.58
Liberty Fertilizer (Sulphate Potash) 5-10-10	1 b.	.40
Liberty Fertilizer 6-3-6	1 b.	2.57
Liberty Fertilizer (with Cotton Hull Ashes) 6-3-6	3 b.	2.72
Liberty Green Gro Fertilizer for Lawns, Flowers, Shrubs, Trees 6-7-4	1	.02
Liberty Fertilizer 7-7-7	3	.91
Armour Fertilizer Works		
Armour's Big Crop Fertilizer 3-12-6	4	.28
Armour's Big Crop Fertilizer 5-8-7	5	.25
Armour's Big Crop Fertilizer 5-10-5	4	.31
Armour's Big Crop Fertilizer 5-10-10	5	.40
Armour's Big Crop Tobacco Special 6-3-6	2 b.	2.48
Armour's Big Crop Fertilizer 7-7-7	2 a.	.27
Armour's Special Ornamental Fertilizer 6-12-4	3	.29
Armour's Victory Garden Fertilizer 5-10-5	3 a.	.33
Ernest J. Bantle		
Bantle's 5-8-7 Potato & Vegetable	1	.16
Bantle's 6-3-6 Tobacco	2 b.	2.91
Belmont Gardens		
Gardenia Fertilizer (Belgard) 6-15-4	1	.83
Berkshire Chemical Co.		
Berkshire 3-12-6	1	.18
Berkshire 5-8-7	9	.15
Berkshire 5-10-5	2 a	.21
Berkshire Victory Garden 5-10-5	1 a.	.15
Berkshire 5-10-10	3	.26
Berkshire 6-3-6 Tobacco	1 b.	1.94
Joseph Breck & Sons Corp.		
Breck's Victory Fertilizer 5-10-5	1 a.	.33
Brexone for Gardens & Lawns 5-10-4	2 a.	.76
Consolidated Rendering Co.		
Corenco 3-12-6 Animal Brand	9 a.	.15
Corenco 5-8-7 Potato and General Crop	4 a	.18
Corenco 5-10-5 Victory Garden Fertilizer	5	.34
Corenco 5-10-10 Peerless Potato	9 a.	.17
Corenco 6-3-6 Special Tobacco Grower	2 b.	3.33
Corenco 6-8-2 Landscape Fertilizer	3	.27
Corenco 7-7-7 Complete Fruit & Top Dressing	3	.14
Eastern States Farmers' Exchange		
Eastern States 5-10-5 Victory Garden with 2% magnesium oxide	3	.17
Eastern States 5-10-10 with 2% magnesium oxide	3	.13
Eastern States 5-17-0	3	.25
Eastern States 8-4-8 Tobacco with .5% magnesium oxide	2 b.	2.29
Eastern States 8-8-8 with 1% magnesium oxide	3	.13
Eastern States 8-16-8 with 1% magnesium oxide	3	.18
Eastern States 8-16-16 with 1% magnesium oxide	3	.18

a. See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b. Potash in forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Thomas W. Emerson Co. Enseco Fertilizer 5-7-4	1	1.57
Essex County Co-operative Farming Association S-X Brand 5-8-7	1	.17
S-X Brand (1% magnesium oxide) 5-10-10	2	.13
S-X Brand 7-7-7	3	.11
H. L. Frost and Higgins Co. Frost and Higgins Special Tree and Shrub Food 6-8-2	1	.25
Grasalo Co. Grasalo Chemical Fertilizer 5-10-5	1	.31
A. H. Hoffman, Inc. Hofman's Victory Garden Fertilizer 5-10-5	2	.53
Hydroponic Chemical Co., Inc. Hyponex 7-6-19	2 a.	.03
Hy-Trous Corp. Hy-Trous 4 8-4	2	—
International Minerals & Chemical Corp. International 3-12-6	3	.10
International 5-8-7	5 a.	.19
International 5-10-5	1	.13
International 5-10-10	4	.13
International 6-3-6	3 b.c.	2.14
International 7-7-7	3	.10
International 8-16-16	2 a.	.17
International Caribee 5-10-10 with 2% magnesium oxide	3	.61
International Specialty 3-12-3 (Lawn & Garden)	3	.56
International Victory Garden 5-10-5	3 a.	.26
Kem-ical Corp. Kem Liquid Plant Food .08-.16-.10	1	—
National Plant Foods, Inc. Hy-Gro Plant Food 13-26-13	1	—
Old Deerfield Fertilizer Co., Inc. Old Deerfield 3-12-6	2	.30
Old Deerfield 5-8-7 Onion & Truck Fertilizer	2	.37
Old Deerfield 5-8-7 (with 2% magnesium oxide) Set Onion & Potato Fertilizer (Potash other than muriate)	1 b.	.36
Old Deerfield 5-10-5 Trucker's Special	2	.12
Old Deerfield 5-10-10 Potato Fertilizer	2	.16
Old Deerfield 5-10-10 (with 2% magnesium oxide) Potato Fertilizer (Potash other than muriate)	1 b.	.13
Old Deerfield 6-3-6 Complete Tobacco Fertilizer	2 b.	2.67
Old Deerfield Lawnshrub 6-5-5	1	.66
Old Deerfield 7-7-7 Grass Top Dressing	2	.58
Old Deerfield 8-16-16	1	.08
Olds & Whipple, Inc. O & W 3-12-6 Corn Fertilizer	1	.57
O & W 5-3-5 Complete Tobacco Fertilizer	1 b.	2.32
O & W 5-8-7 Potato & General Purpose Fertilizer	2	.51
O & W 5-10-10 Potato Fertilizer	2	.40
O & W 6-3-6 Blue Label Tobacco Fertilizer	3 b.	2.98
O & W 6-3-6 Blue Label Fertilizer, Potash derived from Cotton Hull Ash	2 b.	2.67
O & W 7-7-7 Top Dressing & Grass Fertilizer	1	.43
Plantabbs Co. Fulton's "V" Plantabbs 4-12-18	2	2.68
Rogers & Hubbard Co. Gro-Fast Plant Food 5-8-5	1	1.13
Hubbard High Potash Fertilizer 5-10-10	2	1.30
Hubbard Potato Fertilizer 5-8-7	3	1.28
Hubbard Tobacco Grower 6-3-6	3 b.d.	2.85

a. See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b. Potash in forms other than muriate.

c. 1.10% Chlorine found in one sample; tolerance allowed, .85%.

d. 1.20% Chlorine found in one sample; tolerance allowed, .82%.

Mixtures Substantially Complying with Guarantees—Concluded

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Rogers & Hubbard Co.—Concluded		
Hubbard Victory Garden Fertilizer 5-10-5	4	.72
Red H Brand 0-14-14	2	—
Red H Brand 3-12-6	3	.50
Red H Brand 5-8-7	5	.45
Red H Brand 5-10-10	4	.44
Red H Brand 5-10-10 with Sulphate of Potash	1 <i>b.</i>	.85
Red H Brand 7-7-7	3	.43
William H. Rorer, Inc.		
Plant Dinner 5-7-5	1	.56
O. M. Scott & Sons Co.		
Scotts Turf Builder 8-7-3	1 <i>a.</i>	2.66
Sears, Roebuck & Co.		
Garden Master 3-8-7	1	.21
Smith-Douglass Co., Inc.		
Smith 0-14-14 Fertilizer	14 <i>a.</i>	—
Smith 3-12-6 Fertilizer	1 <i>c.</i>	.31
Smith 5-8-7 Fertilizer	1 <i>f.</i>	.53
Smith 5-10-5 Victory Garden Fertilizer (For food production only)	2	.27
Smith 5-10-10 Fertilizer	19 <i>a.</i>	.21
Smith 7-7-7 Fertilizer	1 <i>g.</i>	.19
Standard Wholesale Phosphate & Acid Works, Inc.		
Standard 5-8-7	1	.46
Standard 5-10-5	1	.47
Swift & Company Fertilizer Works		
Swift's Red Steer 5-8-7	1	.20
Vigoro 4-12-4	5	.27
Vigoro Victory Garden Fertilizer 5-10-5 for Food Production Only	3	.21
Tennessee Corp.		
Loma 5-10-5	3	.20
C. P. Washburn Co.		
Market Garden 5-8-7	2	.25
Special Potato 5-10-10	2	.28
Woodruff Fertilizer Works, Inc.		
Woodruff's 5-8-7 Fertilizer	2	.71
Woodruff's Tobacco Special Fertilizer 6-3-6	1 <i>b.</i>	2.26

a. See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b. Potash in forms other than muriate.

c. Composite of 21 samples.

f. Composite of 15 samples.

g. Composite of 13 samples.

CHEMICALS AND RAW PRODUCTS
Unmixed Materials Showing a Commercial Shortage of \$1 or More Per Ton

Name of Manufacturer and Brand	Total Nitrogen Found	Phosphoric Acid		Where Sampled	Approximate Commercial Shortage Per Ton	Manufacturer's Settlement of Shortage
		Total Found	Available Found			
Consolidated Rendering Co.						
Corenco Superphosphate 20%	—	19.45	19.06	Leominster	\$1.29	Rebated
Corenco Superphosphate 20% (a)	—	18.37	18.07	Mattapoisett	2.65	Rebated
A. H. Hoffman, Inc.						
Hoffman's Bone Meal (3.70-20-0)	3.53	19.80	—	New Bedford	<i>b.</i>	—
International Minerals & Chemical Corp.						
International 20% Superphosphate (a)	—	19.31	18.51	West Bridgewater	2.22	Rebated
John Reardon & Sons Division of Wilson & Co., Inc.						
Rearco Ground Bone for Fertilizer (2.47-21-0)	3.82	19.11	—	North Easton	2.65	Rebated
Rogers & Hubbard Co.						
Hubbard 20% Superphosphate (a)	—	19.41	19.33	Marlboro	1.01	Rebated
Sewerage Commission of the City of Milwaukee						
Milorganite (6-2-0)	5.56	2.70	2.26	Fall River	3.60	Rebated
Milorganite (6-2-0)	5.63	2.95	2.71	Taunton	2.91	Rebated
Milorganite (6-2-0)	5.73	2.80	2.40	South Framingham	2.13	Rebated
Milorganite (6-2-0)	5.85	2.65	2.21	North Dartmouth	1.18	Rebated
Milorganite (6-2-0)	5.75	2.75	2.35	Springfield	2.56	Rebated
Milorganite (6-2-0)	5.19	2.70	2.42	Wellesley	8.29	Rebated
Milorganite (6-2-0)	5.63	2.70	2.30	New Bedford	3.03	Rebated
Milorganite (6-2-0)	5.59	2.75	2.31	Weston	3.23	Rebated
Milorganite (6-2-0)	5.68	2.70	2.26	Falmouth	2.62	Rebated
Milorganite (6-2-0)	5.52	2.55	2.15	Hyannis	3.78	Rebated
Milorganite (6-2-0) (c)	5.55	2.50	2.22	East Bridgewater	3.69	Rebated

a. See also table "Phosphoric acid compounds."

b. Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with other seriously deficient materials.

See also table "Ground bone."

c. See also table "Bone and tankage, dry ground fish, animal tankage, Milorganite."

NITROGEN COMPOUNDS

Ammonium Nitrate, Calcium Cyanamid, Nitrate of Soda,
Sulphate of Ammonia, Synthetic Urea

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
Allied Chemical & Dye Corp., The Barrett Division		
Arcadian the American Nitrate of Soda	16.24	16.00
Arcadian the American Nitrate of Soda	15.92	16.00
Arcadian Sulphate of Ammonia	20.86	20.60
American Cyanamid Co.		
21% Aero Cyanamid Pulverized	21.68	21.00
20.6% Aero Cyanamid Granular	20.60	20.60
Ashcraft-Wilkinson Co.		
Nitraprills Fertilizer Compound	33.80	32.50
Nitraprills Fertilizer Compound	32.56	32.50
Nitraprills Fertilizer Compound	32.93	32.50
Chilean Nitrate Sales Corp.		
Chilean Nitrate of Soda—Champion Brand	15.88	16.00
Chilean Nitrate of Soda—Champion Brand	15.95	16.00
Chilean Nitrate of Soda—Original Old Style	15.86	16.00
Chilean Nitrate of Soda—Original Old Style	15.86	16.00
E. I. du Pont de Nemours & Co., Inc.		
Du Pont Uramon Fertilizer Compound	43.18	42.00
Du Pont Uramon Fertilizer Compound	43.56	42.00
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield Sulphate of Ammonia	20.70	20.00

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Armour Fertilizer Works	60.08	60.00
Consolidated Rendering Co.	60.08	60.00
	61.04	60.00
Eastern States Farmers' Exchange	61.54	60.00
Middlesex County Farm Bureau Association	61.34	60.00
Old Deerfield Fertilizer Co., Inc.	59.35	60.00

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
18% Normal Superphosphate	18.28	18.12	18.00
18% Normal Superphosphate	19.82	18.70	18.00
Apothecaries Hall Co.			
Superphosphate 20%	21.46	20.30	20.00
Superphosphate 20%	21.56	20.54	20.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%	21.19	20.21	20.00
Armour's Big Crop Superphosphate 20%	20.68	19.78	20.00
Consolidated Rendering Co.			
Corenco Superphosphate 20%	20.07	19.93	20.00
Corenco Superphosphate 20%	20.65	20.15	20.00
Corenco Superphosphate 20%	20.75	20.23	20.00
Corenco Superphosphate 20%	20.65	20.45	20.00
Corenco Superphosphate 20%	20.47	19.98	20.00
Corenco Superphosphate 20%	21.95	20.93	20.00
Corenco Superphosphate 20%	20.49	20.02	20.00
Corenco Superphosphate 20%	20.85	20.37	20.00
Corenco Superphosphate 20% (a.)	19.95	19.85	20.00
Davison Chemical Corp.			
Davco Granulated 20% Superphosphate	21.27	20.05	20.00
Davco Granulated 20% Superphosphate	21.47	20.49	20.00
Eastern States Farmers' Exchange			
Eastern States Superphosphate 20%	21.27	20.09	20.00
Eastern States Superphosphate 20%	22.54	21.52	20.00
Eastern States Superphosphate 47%	47.73	47.53	47.00
International Minerals & Chemical Corp.			
International 20% Superphosphate	20.50	20.20	20.00
International 20% Superphosphate	21.20	20.80	20.00
International 20% Superphosphate	21.32	20.63	20.00
International 20% Superphosphate	20.85	20.37	20.00
International 20% Superphosphate	20.27	19.81	20.00
International 20% Superphosphate	20.55	20.04	20.00
International 20% Superphosphate	21.40	21.00	20.00
International 20% Superphosphate	21.15	20.85	20.00
International 20% Superphosphate (a.)	20.68	20.13	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield 20% Superphosphate	20.39	20.31	20.00
Rogers & Hubbard Co.			
Hubbard 20% Superphosphate (a.)	19.90	19.82	20.00

a. See table of "Unmixed materials showing a commercial shortage of \$1 or more per ton."

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID
Bone and Tankage, Dry Ground Fish, Animal Tankage, Milorganite

Manufacturer	Nitrogen		Total Phosphoric Acid		Degree of Fineness
	Found	Guaranteed	Found	Guaranteed	Coarser than 1.50 Inch
Consolidated Rendering Co.					
Raw Bone & Tankage	4.01	4.00	21.27	20.00	58.18
Raw Bone & Tankage	4.01	4.00	21.17	20.00	57.34
Rogers & Hubbard Co.					
Hubbard's Dry Ground Fish Meal	9.60	9.46	6.94	5.00	—
N. Roy & Son					
Animal Tankage	7.82	8.00	10.29	— a.	44.18
Sewerage Commission of the City of Milwaukee					
Milorganite	5.93	6.00	2.94	— b.	—

a. Available phosphoric acid found 9.04%; guaranteed 7.00%.

b. Available phosphoric acid found 2.63%; guaranteed 2.00%.

See table of "Unmixed materials showing a commercial shortage of \$1 or more per ton."

Ground Bone

Manufacturer	Nitrogen		Total Phosphoric Acid		Degree of Fineness
	Found	Guaranteed	Found	Guaranteed	Coarser than 1.50 Inch
Apothecaries Hall Co.	2.65	2.25	25.76	22.00	26.5
Armour Fertilizer Works	2.62	2.47	26.66	23.00	29.9
Consolidated Rendering Co.	2.75	2.47	24.31	23.00	29.3
	2.43	2.47	25.63	23.00	29.6
Eastern States Farmers' Exchange	2.23	2.30	23.80	23.00	31.9
A. H. Hoffman, Inc. (a.)	3.69	3.70	19.60	20.00	42.7
	3.70	3.70	22.93	20.00	36.6
	4.24	3.70	22.64	20.00	36.5
	2.82	2.00	24.46	25.00	18.6
	4.31	4.00	23.96	23.00	11.6
Rogers & Hubbard Co.	4.44	4.00	23.30	23.00	5.5
	4.36	4.00	23.52	23.00	13.0
	4.27	4.00	23.97	23.00	15.0
	4.27	4.00	23.52	23.00	2.5
	4.33	4.00	23.03	23.00	2.8

a. See table of "Unmixed materials showing a commercial shortage of \$1 or more per ton."

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen		Available Phosphoric Acid		Phosphoric Acid		Water Soluble Potash		Organic Matter	Acid Insoluble Ash (a)	Moisture
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed			
American Agricultural Chemical Co.											
Sheep Manure	1.92	1.25	-	-	1.52	1.00	4.22	3.00	60.17	13.50	11.23
Apothecaries Hall Co.											
Sheep Manure	1.92	1.00	1.29	.50	1.37	-	4.21	1.00	60.71	14.81	11.25
Armour Fertilizer Works											
Sheep Manure	1.65	1.25	-	-	1.22	1.00	3.64	2.00	53.88	21.34	12.44
Atkins & Durbrow, Inc.											
Dicouure	3.59	2.00	2.97	1.00	3.69	-	1.65	1.00	69.14	3.29	15.31
Berkshire Chemical Co.											
Berkshire Sheep Manure	1.93	1.25	1.39	1.00	1.47	-	4.28	2.00	60.63	16.65	9.16
Consolidated Rendering Co.											
Coronco Sheep Manure	1.89	1.25	-	-	1.52	1.00	4.15	2.00	55.10	25.83	6.99
Glendale Poultry Farm											
"Biff" Peat-Poultry Manure	2.91	2.00	4.31	3.00	4.70	-	2.46	1.00	60.09	1.91	14.80
Goulard & Olena, Inc.											
G & O Sheep Manure	1.83	1.00	-	-	2.74	1.00	3.80	2.00	38.79	35.51	7.21
A. H. Hoffman, Inc.											
Hoffman's Cow Manure (Dehydrated)	2.44	2.00	1.24	1.00	1.32	-	2.15	1.00	85.13	1.73	5.24
Hoffman's Sheep Manure (Kiln-Dried)	1.97	1.85	1.16	1.00	1.32	-	3.26	2.50	60.38	25.94	5.31

a. The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food.

PULVERIZED ANIMAL MANURES—Concluded

Manufacturer and Brand	Total Nitrogen		Available Phosphoric Acid		Phosphoric Acid		Water Soluble Potash		Organic Matter	Acid Insoluble Ash (a)	Moisture
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed			
International Minerals & Chemical Corp.											
International Sheep Manure (Caribee)	1.82	1.25	—	—	1.47	1.00	4.42	2.00	58.47	21.24	6.53
Norwood Brand Fertilizer Co.											
Norwood Brand Sheep Manure Screened from Wood	1.71	1.83	45	89	49	—	4.11	1.03	39.04	45.44	4.39
Norwood Brand Sheep Manure Screened from Wood	1.64	1.83	22	89	34	—	4.24	1.03	39.87	43.05	5.38
Pulverized Manure Co.											
Wizard Brand Cow Manure	2.12	2.00	1.39	1.00	1.47	—	2.75	1.00	64.79	20.10	4.98
Wizard Brand Pulverized Sheep Manure	2.07	2.00	2.08	1.00	2.16	—	3.60	2.00	71.58	10.66	5.89
Ramshorn Mills, Inc.											
Sheep Manure—Wool Waste	2.33	2.00	.75	.50	.83	—	4.90	4.50	49.89	32.43	5.40
Rogers & Hubbard Co.											
Gro-Fast Sheep Manure	1.93	1.25	—	—	1.32	1.00	4.17	2.50	63.14	10.85	12.81
Stockdale Fertilizer Co.											
Ovone (Sheep Manure)	2.19	2.00	1.49	1.00	1.57	—	2.95	2.00	70.38	11.38	7.58
Swift & Company Fertilizer Works											
Swift's Sheep Manure	1.77	1.50	1.34	1.00	1.12	—	4.34	2.50	53.33	21.34	11.83
Walker-Gordon Laboratory Co., Inc.											
Boxing	2.30	2.00	1.35	1.00	1.17	—	2.13	1.00	83.67	2.01	6.20

a. The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food.

AGRICULTURAL LIME PRODUCTS

Manufacturers and Brands

During 1944, 15 firms registered for sale in Massachusetts 30 brands of lime products, manufactured and sold for neutralizing acid soils, and one brand of agricultural talc. The products are grouped as follows:

Hydrated or slaked lime	16
Pulverized and ground limestone	14
	30
Agricultural talc	1

The analytical results which appear in this bulletin represent officially drawn samples secured by the same sampling agents who drew the samples of commercial fertilizer which served for the inspection of that commodity; the samples therefore came from every section of the state and are, we believe, representative of the lime products sold in Massachusetts as soil amendments.

We were not successful in securing samples of the following brands:

- L. A. Howard & N. L. Howard**, Proctorsville, Vt.
Howard's Agricultural Talc
- Kelley Island Lime & Transport Co.**, 1122 Leader Building, Cleveland, Ohio.
Tiger All Purpose Hydrated Lime
- Limestone Products Corporation of America**, Newton, N. J.
"Lime Crest" Brand Calcite Hydrated Lime for Agriculture Use
"Lime Crest" Brand Calcite Pulverized (Pulverized Limestone)
- Rockland-Rockport Lime Co., Inc.**, Rockland, Maine
R-R Ground Limestone, Grade M
- Solvay Process Co.**, Syracuse, N. Y.
Solvay Pulverized Limestone
- United States Gypsum Co.**, 300 West Adams St., Chicago, Ill.
Red Top Hydrate Lime—Genoa, Ohio
USG Agricultural Limestone—Falls Village, Conn.

Variations and Deficiencies Found in the Composition of Lime Products

Of the lime products effective in neutralizing soil acidity, about 67 per cent of the samples analyzed fully met the minimum guarantee; of the 14 samples of ground limestone, 6 showed deficiencies. The deficiencies were not of a serious nature as the companion ingredient was present in sufficient excess in most cases to more than make up the full neutralizing value of the product as based on the stated guarantee. The same may be said of the hydrated lime products where 3 out of 12 samples showed a deficiency. The tables of analyses show the extent of variations from the guaranteed composition.

Explanation of Table of Analyses

Tables I, II, III, "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Table II and III, "Carbonates of calcium and magnesium". Some of the figures in this column include small amounts of calcium and magnesium combined as basic silicates: therefore in some cases the sum of the calcium and magnesium carbonates and the insoluble matter slightly exceeds 100 per cent.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass or be retained by the meshed sieves mentioned.

The limestone products have been published in two groups or grades (see tables II and III) according to fineness of grinding and to conform to definitions voted by the Association of Official Agricultural Chemists at their 1936 meeting.

Table I. Hydrated or Slaked Lime

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass.							
Green Mountain Handy Hydrate	62.9	60.0	5.0	1.0	69.5	1389	1.8
Snow-Fluff Agricultural Hydrate	70.3	70.0	2.7	5.0	73.8	1475	2.7
Sure Crop Agricultural Hydrate	68.1	65.0	4.2	1.0	70.5	1409	6.5
A. H. Hoffman, Inc., Landisville, Penn.							
Hoffman's Hydrate Lime	64.1	70.0	2.2	1.0	65.6	1312	3.0
Huossac Valley Lime Co., Inc., Adams, Mass.							
Adams Land Lime	58.5	60.0	1.4	5	59.7	1195	1.4
Lee Lime Corporation, Lee, Mass.							
Lee Double Strength Agricultural Hydrate Lime	47.5	46.0	32.5	31.0	91.9	1837	1.0
Tobey Agra Hydrate	39.4	35.0	27.1	25.0	76.6	1532	.9
New England Lime Co., Adams, Mass.							
Nelco Agricultural Hydrate Lime (Adams)	71.9	70.0	1.3	5	73.8	1477	1.1
Nelco Agricultural Hydrate Lime	47.1	47.0	31.6	31.0	91.7	1834	1.0
Nelco Land Lime (Canaan, Conn.)	44.8	35.0	31.2	25.0	86.4	1729	1.3
United States Gypsum Co., 300 West Adams St., Chicago, Ill.							
Red Top Hydrate Lime—Farnams, Mass.	71.8	70.0	1.3	1.0	73.2	1464	1.2
USG Hydrate Lime (Masons-Agric.)—Farnams, Mass.	71.6	70.0	1.4	1.0	73.0	1461	1.4

Table II. Pulverized Limestone (Fine-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Carbonates of Calcium and Magnesium		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds In One Ton		Finer than 100-mesh	Coarser than 20-mesh
Gould & Olena, Inc., 140 Liberty St., New York, N. Y.											
Agricultural Limestone	29.7	28.97	15.3	20.42	81.1	93.24	48.1	96.2	18.9	88.8	none
Lee Lime Corporation, Lee, Mass.											
Tobey Pulverized Limestone	30.9	35.0	21.1	10.0	99.3	90.0	60.1	1202	9	75.9	5
Tobey Pulverized Limestone	42.1	35.0	8.9	10.0	93.6	90.0	53.8	1076	6.8	85.1	4
New England Lime Co., Adams, Mass.											
Nelco Agricultural Limestone (Adams)	54.9	53.5	4	4	98.0	96.3	55.1	1101	2.0	99.5	none
Nelco Agricultural Ground Limestone (Canaan, Conn.)	31.4	30.0	21.7	20.0	99.3	97.4	61.1	1223	7	79.2	1.2
D. U. Smith & Bro., Ashley Falls, Mass.											
Ashley White Dolomite Agricultural Limestone	30.5	30.0	20.6	21.0	97.5	98.0	58.5	1171	2.7	86.0	none
United States Gypsum Co., 300 West Adams St., Chicago, Ill.											
USG Agricultural Limestone—Farnams, Mass.	48.3	50.5	2.9	.25	91.2	91.0	51.7	1034	8.8	85.5	none

Table III. Ground Limestone (Coarse-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Carbonates of Calcium and Magnesium		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
	Grangers Manufacturing Co., 53 State St., Boston, Mass.										
Grangers Agricultural Limestone	40.8	34.0	7.6	6.0	88.6	90.0	51.8	1036	9.9	65.9	none
Hoosac Valley Lime Co., Inc., Adams, Mass.											
Hoosac Agricultural Limestone	53.6	51.5	.7	.5	97.0	90.0	54.5	1090	3.1	60.3	14.5 ^d
Lee Lime Corporation, Lee, Mass.											
Lee Pulverized Limestone	30.7	30.0	21.5	20.0	99.7	93.0	60.2	1204	6	50.1	.4
Lee Pulverized Limestone	36.7	30.0	21.5	20.0	99.6	93.0	60.3	1207	5	70.4	2.1
Lee Pulverized Limestone	30.9	30.0	20.7	20.0	98.5	93.0	60.1	1203	7	54.7	.3
Clifford L. Miller, West Stockbridge											
Monarque Pulverized Limestone	41.4	39.0	10.6	11.0	95.6	93.1	55.7	1130	4.4	72.1	2.0
Monarque Pulverized Limestone	39.2	39.0	11.1	11.0	93.1		54.3	1086	6.6	74.3	1.3

4. Fineness tests were made on two other samples.
 Sample A: 89.83% finer than 100-mesh, 0.29% coarser than 20-mesh.
 Sample B: 91.32% finer than 100-mesh, 0.27% coarser than 20-mesh.

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1944**

- Acme Guano Co., 411 National Marine Bank Bldg., Baltimore, Md.
 Agricultural Laboratories, Inc., 1145 Chesapeake Ave., Columbus, Ohio
 Allied Chemical & Dye Corporation, The Barrett Division, 40 Rector St., New York, N. Y.
 American Agricultural Chemical Co., 285 River St., North Weymouth, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd & St. Clair Sts., Marietta, Ohio
 American Potash & Chemical Corporation, 122 East 42nd St., New York 17, N. Y.
 Apothecaries Hall Co., Waterbury, Conn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., 601 Trust Company of Georgia Bldg., Atlanta, Ga.
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.
 Ernest J. Bantle, 139 Griswold St., Glastonbury, Conn.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Belmont Gardens, W. E. Lenk, Proprietor, 170 Brighton St., Belmont, Mass.
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport 5, Conn.
 Joseph Breck & Sons Corporation, 85 State St., Boston, Mass.
 Buell Fertilizer Co., R.F.D. 2, Exeter, N. H.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Davison Chemical Corporation, 20 Hopkins Place, Baltimore, Md.
 E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.
 Eastern States Farmers' Exchange, 95 Elm St., West Springfield, Mass.
 Thomas W. Emerson Co., 70 Park St., Beverly, Mass.
 Essex County Co-operative Farming Association, South Main St., Topsfield, Mass.
 Excell Laboratories, 2625 Indiana Ave., Chicago, Ill.
 H. L. Frost & Higgins Co., 20 Mill St., Arlington, Mass.
 Glendale Poultry Farm, Somerset, Mass.
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.
 Grasalo Co., Wilmington, Mass.
 A. H. Hoffman, Inc., Landisville, Penn.
 Humphreys-Godwin Co., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., 315 West 39th St., New York 18, N. Y.
 Hy-Trous Corporation, 131 State St., Boston, Mass.
 International Minerals & Chemical Corporation, Woburn, Mass.
 Kem-ical Corporation, 21-23 Summit Ave., East Paterson, N. J.
 L. B. Lovitt & Co., Memphis, Tenn.
 Middlesex County Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 National Plant Foods, Inc., Dunnellen, N. J.
 Norwood Brand Fertilizer Co., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 Plantabbs Co., Baltimore 1, Md.
 Pulverized Manure Co., 603 Exchange Bldg., Union Stock Yards, Chicago 9, Ill.
 Ramshorn Mills, Inc., West Millbury, Mass.
 Ra-Pid-Gro Corporation, Dansville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 William H. Rorer, Inc., 254 South Fourth St., Philadelphia, Penn.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck & Co., 925 South Homan Ave., Chicago, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
 Smith-Douglass Co., Inc., 304 East Plume St., Norfolk, Va.
 Standard Wholesale Phosphate & Acid Works, Inc., Baltimore, Md.
 Stockdale Fertilizer Co., Morris, Ill.
 Swift & Company Fertilizer Works, 910 Court Square Bldg., Baltimore, Md.
 Tennessee Corporation, Lockland, Ohio
 Walker-Gordon Laboratory Co., Inc., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro, Mass.
 Woodruff Fertilizer Works, Inc., North Haven, Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 123

DECEMBER 1944

Seed Inspection

By F. A. McLaughlin

This report, the seventeenth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1944, by authority of Chapter 94 as amended by Chapter 288 of the Acts of 1937 and Chapter 363 of the Acts of 1938.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

ANNOUNCEMENT

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:	Units
Purity analysis (red clover, timothy, etc.).....	1
Purity analysis (bluegrass, orchard grass, etc.).....	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture).....	4-10
Examination for noxious weeds (sample of 4 oz. or less).....	2
Identification of seed or plant.....	1
Cleaning tobacco seed (4 oz. or less).....	2
Germination test (4 x 100 seeds of any seed not chaffy or requiring purity analysis).....	1
Germination test (soil, 2 x 100 seeds).....	1
Germination test (chaffy grasses or seeds requiring purity analysis)	2

Fees for work in excess of the ten free units allowed to a citizen or resident firm of Massachusetts are as follows:

Germination test of all crop seeds except grasses.....	\$0.25
Germination test of timothy.....	.25
Germination test of all other grasses.....	.50
Purity analysis of cereals.....	.50
Purity analysis of timothy.....	.75
Purity analysis of all other grasses.....	1.00
Purity analysis of all other crop seeds.....	.75
Purity analysis of mixtures of not more than 2 kinds of agricultural seeds.....	1.00
Purity analysis of special mixtures, including lawn grasses and pasture mixtures — a charge sufficient to cover the actual cost of working the sample, depending entirely upon the character of the sample. Minimum charge.....	1.25

In no case will the final report be rendered until all fees are paid.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seed of any one kind to be submitted for a germination test is 400.

SEED INSPECTION

By F. A. McLaughlin¹

MASSACHUSETTS VEGETABLE SEED STANDARDS FOR 1945

Section 261D of the Seed Law requires that a set of standards for germination of vegetable seeds be determined each year by the Director of the Massachusetts Agricultural Experiment Station and approved by the Commissioner of Agriculture. The following set of standards for 1945 has been so determined and approved.

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke.....	60	Kohlrabi.....	75
Asparagus.....	*70	Leek.....	60
Beans:		Lettuce.....	80
Limas.....	70	Melons:	
Other varieties than Limas..	80	Muskmelon.....	75
Beets.....	65	Watermelon.....	70
Broccoli.....	75	Mustard.....	75
Brussels Sprouts.....	70	Okra.....	*50
Cabbage.....	75	Onions.....	70
Carrot.....	55	Parsley.....	60
Cauliflower.....	75	Parsnip.....	60
Celeriac.....	55	Peas.....	80
Celery.....	55	Peppers.....	55
Chard, Swiss.....	65	Pumpkin.....	75
Chicory.....	65	Radish.....	75
Chinese Cabbage.....	75	Rhubarb.....	60
Citron.....	65	Rutabaga.....	75
Collards.....	80	Salsify.....	75
Corn, Sweet.....	75	Sorrel.....	60
**Cress, Garden.....	40	Spinach:	
Cress, Water.....	25	Common.....	60
Cucumber.....	80	New Zealand.....	40
Dandelion.....	45	Squash.....	75
Egg Plant.....	60	Tomato.....	75
Endive.....	70	Tomato, Husk.....	50
Fetticus (Corn Salad).....	70	Turnip.....	80
Kale.....	75		

*Including Hard Seeds.

**Garden Cress (*Lepidium sativum*) is also called Pepper Grass and Curled Cress. Should not be confused with Upland Cress or Spring Cress (*Campe verua*) for which no standard has been adopted.

The above set of standards is identical with the one adopted by the United States Department of Agriculture for administration of the Federal Seed Act.

¹Assisted by Miss Jessie L. Anderson, Technical Assistant; Miss Phoebe Anne Wood, Laboratory Assistant from March to September, 1944; and Miss May J. Honnay, Clerk.

1944 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1943, to November 1, 1944, the Seed Laboratory received 5080 samples of seed, of which 1184 were collected by the State Department of Agriculture and 3896 were sent in by seedsmen, farmers, and various state institutions. An additional lot of 261 samples of flower seeds, for field tests only, was received from the State Commissioner of Agriculture. Although 5080 samples of seed were received, 363 of these had not been tested on November 1, 1944, consequently the actual number of samples worked during the year is 4717.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 4717 samples was 5236; 273 for purity and 4963 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
194 Field Crops for Purity and Germination.....	194	194
647 Field Crops for Germination Only.....		647
1 Field Crop for Purity Only	1	...
62 Lawn and Other Types of Mixtures for Purity; Germinations involving 211 ingredients.....	62	211
16 Lawn Mixtures for Purity Only.....	16	...
37 Lawn Mixtures for Germination Only, Germinations involving 151 ingredients.....		151
3636 Vegetables for Germination Only.....		3636
5 Herbs for Germination Only.....		5
10 Tree Seeds for Germination Only.....		10
64 Tobacco Seeds for Cleaning and Germination.....		64
14 Tobacco Seeds for Germination Only.....		14
31 Flower Seeds for Germination Only.....		31
<hr/>	<hr/>	<hr/>
4717	273	4963

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested respectively 453 samples of Vegetable seeds and 261 samples of Flower seeds. Results of the field tests are shown on pages 29-41.

The Seed Laboratory cleaned 78 lots of Tobacco seed and 22 lots of Onion seed for Connecticut Valley farmers. The gross weight of the 78 lots of Tobacco seed amounted to 33 pounds with a net weight of cleaned seed of 25.50 pounds. Onion seed received had a gross weight of 1621 pounds which was cleaned to a net weight of 838 pounds.

Explanation of Tables

Each of the following tables contains seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. The samples were taken by an inspector from the State Department of Agriculture and worked at the Seed Laboratory. Section 261A of the Acts and Resolves of 1937 and 1938, Chapters 288 and 363, defines the group from Alfalfa to Wheat, inclusive; Section 261B, Mixtures; Section 261C, Special Mixtures; and Section 261D, Vegetables.

The last table is a summary, by wholesalers, of the total number of samples tested under each of the above four sections and the number of samples found to be mislabeled.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement.

Mislabeling and other irregularities are emphasized in the tables by boldface type and explained in the final column of the table or in footnotes.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except for vegetable seed found below the minimum germination standards adopted, in which instance no tolerance is allowed. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

GIVEN GERMINATION PERCENT	TOLERANCE PERCENT
96 or over.....	5
90 or over, but less than 96.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

In the determination of the tolerance for the percentage of the distinguishable kind, type, or variety (pure seed), weed seeds, other crops seeds, and inert matter, the sample shall be first considered as made up of two parts: (a) The percentage of the component (pure seed, weed seed, crop seed or inert matter as the case may be) being considered, and (b) the difference between that percentage and 100. The number represented by (a) is then multiplied by the number represented by (b) and the product is divided by 100. The resulting number is then multiplied by 0.2 (2/10) and the resulting product added to 0.2 or 0.6 as indicated in the following formulae:

$$\text{Pure seed tolerance} = 0.6 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

$$\text{Weed seeds, other crop seeds, and inert matter tolerance} = 0.2 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

For *Poa* spp., *Agrostis* spp., *Festuca* spp., bromegrass, crested wheatgrass, orchard grass, velvet grass, tall oatgrass, meadow foxtail, sweet vernalgrass, Rhodes grass, Dallis grass, carpet grass, and Bermuda grass, and mixtures containing these seeds singly or combined in excess of 50 percent, an additional tolerance shall be allowed. This is to be obtained by adding to the regular tolerance mentioned above the product obtained by multiplying the regular tolerance by the lesser of "a" and "b" divided by 100.

Results of Inspection and Analyses of Field Seeds — Section 261A

Each lot of Agricultural Seeds must be labeled to show the name and variety; approximate percentage, by weight, of purity; approximate total percentage, by weight, of weed seeds; name and approximate number per ounce of each kind of noxious weed seeds present, singly or collectively, as follows: (1) in excess of one seed in each five grams of grasses, alfalfa and clovers; (2) in excess of one seed in each twenty-five grams of millets, rape and other seeds of similar size; (3) in excess of one seed in each hundred grams of wheat, oats, rye, and other seeds as large or larger than wheat; the approximate percentage of germination of such agricultural seed, and the month and year such seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dockler species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Two hundred and sixty two samples of field crop seeds were sampled and analyzed in the laboratory. Results of analyses, however, are given only for samples which were mislabeled. In this table complete analysis is recorded, but mislabeling, indicated by boldface type, is applied only to the items named above. Where evidence shows that seed was purchased by the retailer in a previous season and again offered for sale during the current season, without having been retested, the name of wholesaler is withheld, and such samples are recorded under "Wholesaler Unknown." Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1308	Bluegrass	Associated Seed Growers, Inc., New Haven, Conn. Frank Howard, Inc., Pittsfield Kentucky, No. 6963	L F 90.00 91.19	* 0.18	— 8.63	—	* 85.00	* 7/25/44	*Required information not given.
1259	Clover	Phillips General Store, Williamstown White	L F 97.71	* 0.64	— 0.58	— 1.07	— 74.22	* 8/16/44	*Required information not given.
933	Barley	Joseph Breck & Sons, Boston, Mass. *Wisconsin No. 38 Type, No. 120-12	L F 99.36 99.22	0.45	0.17 0.30	0.02 0.48	92.00 84.00	1/19/44 8/8/44	*Variety of "Variety Unknown" required; "Type" not satisfactory. Germination below that stated.
941	Bluegrass	Kentucky	L F 98.92 96.53	Trace 0.18	1.07 3.20	0.09	85.00 78.00	2/19/44 6/13/44	Purity below that stated; Inert Matter excessive.

927	Buckwheat	*No. 112-15.....	L	99.50	0.05	0.45	—	92.00	1/1944	*Variety required but not given— found to be Common Buck- wheat.
		The Welch Co., Scituate	F	99.74	0.02	0.24	—	99.00	7/21/44	
1191	Clover	White, No. 82-12.....	L	98.70	0.62	0.09	0.54	88-9	1/1944	Germination below that stated
		Comstock, Ferre & Co., Wethersfield, Conn. Harvey's Hardware Store, Falmouth Mammoth Long Red.....	F	99.16	0.18	0.11	0.55	59-38	8/18/44	
1355	Mangel	Arthur R. Conc, Buffalo, N. Y. Essex County Co-operative Farming Assoc., Topsfield Medium Red, No. 15-522.....	L	98.00	—	—	—	86.00	1/1944	Germination below that stated.
			F	99.78	—	0.22	—	69.00	7/14/44	
1133	Clover	Yellow Blossom, No. 29-133.....	L	99.00	0.55	0.10	0.35	82-10	4/1944	Purity below that stated; Weed Seed and Other Crop Seed exces- sive. Noxious weeds not declared but 62 English Plantain per oz. found.
			F	97.52	1.49	0.10	0.89	81-4	8/16/44	
1138	Clover-Sweet	Chewings, No. 100-501.....	L	98.50	0.20	0.60	0.70	75-10	1/1944	Germination below that stated.
			F	99.61	0.31	0.03	0.05	37.00	8, 22/44	
1136	Fescue	Farm Service Stores, Lowell Hungarian, No. 38-268.....	L	98.50	0.20	0.60	0.70	85.00	1/1944	Purity below that stated; Weed Seed excessive.
			F	97.27	0.95	0.57	1.21	92.00	7/28/44	
957	Millet	Japanese, No. 38-231.....	L	98.60	1.06	0.24	0.10	80.00	1/1943	Germination below that stated.
			F	98.94	0.86	0.12	0.08	59.00	8, 22/44	
960	Millet	No. 10-472.....	L	98.25	1.71	0.04	—	85.00	1/1942	Purity below that stated; Weed Seed excessive.
		Farm Service Stores, Middleboro Alsike, No. 25-378.....	F	96.78	3.17	0.05	—	88.00	8/9/44	
962	Timothy	Medium Red, No. 15-472.....	L	99.66	0.10	0.14	0.10	90.00	12/1943	Germination below that stated.
			F	99.57	0.19	0.19	0.05	74.00	8/7/44	
1399	Clover	Farmers Feed & Supply Co., Amesbury No. 28-364.....	L	97.17	0.40	0.23	2.30	75-15	1/1944	72 Curled Dock per lb. Noxious Weed Seed excessive. Noxious weeds not declared but 41 Eng- lish Plantain per oz. found.
			F	96.31	0.76	0.42	2.51	73-13	8/21/44	
1398	Clover		L	99.05	0.43	0.13	0.39	72-16	1/1944	7 Curled Dock per oz. Noxious weeds not declared but 23 English Plantain per oz. found.
			F	99.09	0.53	0.32	0.06	82-6	8/16/44	
1411	Alfalfa		L	99.30	0.20	0.40	0.10	72-19	2/1944	Germination below that stated.
			F	99.50	0.22	0.24	0.04	58-30	8, 10/44	

Results of Inspection and Analyses of Field Seeds — Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number; Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed		Weed Seed		Inert Matter		Other Crop Seed		Germination %	Date of Test	Violations
			%	%	%	%	%	%					
Arthur R. Conc —Continued													
1095	Clover	Hailey's grain Store, Palmet Red, No. 15-418	L F	99.52 99.67	0.16 0.06	0.09 0.12	0.23 0.15	75-15 68-3				12/1943 7/21/44	Noxious weeds not declared but 17 English Plantain per oz. found.
1124	Soy Beans	Middlesex County Farm Bureau Assoc., Waltham Manchu, No. 42-274	L F	99.00 99.67	0.10 —	0.40 0.15	0.50 0.18	90.00 81.00				3/1944 7/10/44	Germination below that stated.
1296	Clover	Harry Seder, Webster Alsike, No. 25-254	L F	98.60 98.06	0.35 0.17	0.55 1.54	0.50 0.23	79-13 64.9				8/1940 8/1944	Germination below that stated.
991	Clover	Sunshine Feed Store, Ayer Ladino, No. 100-503	L F	99.10 98.69	0.10 0.34	0.60 0.53	0.20 0.44	82-10 90-9				3, 1944 8/11/44	23 Carley Dock per oz. Noxious weeds not declared but 42 English Plantain per oz. found.
994	Ryegrass	Domestic, No. 39-64	L F	99.53 98.53	0.12 0.22	0.31 0.61	0.04 0.64	97.00 92.00				12/1943 8 2/44	Germination below that stated; Inert matter excessive.
1253	Clover	Sunshine Feed Store, Greenfield Red, No. 15-484	L F	99.11 99.16	0.75 0.66	0.07 0.07	0.07 0.11	82-10 75-20				2 1944 8 16 44	Noxious weeds not declared, but 19 English Plantain per oz. found.
1252	Timothy	No. 10-472	L F	99.66 99.61	0.10 0.21	0.14 0.14	0.10 0.04	90.00 80.00				12/1943 8 7/44	Germination below that stated.
1348	Clover	Sunshine Feed Store, Westfield Alsike, No. 25-327	L F	98.42 97.45	0.48 1.54	0.35 0.10	0.75 0.91	80-8 59.9				1 1944 8/26/44	Noxious weeds not declared, but 11 English Plantain per oz. found. Germination below that stated; Weed seed excessive.
1278	Redtop	Craver-Dickinson Co., Chicago, Ill. Carr Hardware Co., Pittsfield No. 41-48	L F	95.00 93.78	0.20 0.13	4.40 5.96	0.40 0.13	90.00 79.00				2/1944 8/4/44	Germination below that stated.
1309	Bluegrass	Albert Dickinson Co., Chicago, Ill. Frank Howard, Inc., Pittsfield Kentucky, No. 32452	L F	92.36 88.65	0.10 0.17	7.44 11.18	0.10 —	80.00 66.00				12/1943 8/22/44	Germination below that stated.
1117	Bluegrass	New England Toro Co., West Newton Kentucky, No. 032110	L F	93.10 92.52	0.50 0.25	6.30 7.23	0.10 —	84.00 74.00				2/1944 6/22/44	Germination below that stated.

1148	Buckwheat	Eastern States Farmers' Exchange, Springfield, Mass. Eastern States Farmers' Exchange, Danvers *Selected, No. 1055.....	L F	99.00 99.59	0.10 —	0.55 0.41	0.35 —	93.00 95.00	2/1944 7/21/44	*Variety required but not given.
1028	Mangel	Charles C. Hart Seed Co., Welbersfield, Conn. Davis Hardware Co., Gardner Giant Long Red.....	L F	* 99.74	— —	— 0.26	— —	75.00 65.00	1/1944 7/3/44	*Purity required but not given. Germination below that stated.
735	Mangel	Federal Supply Co., Northampton Giant Long Red.....	L F	* 99.84	— —	0.16 —	— —	75.00 71.00	1/1944 6/16/44	*Purity required but not given.
811	Clover	Wakefield Supply Co., Wakefield White.....	L F	98.15 97.68	0.30 2.13	0.10 —	1.45 0.10	89.5-8 94.4	* 1/18/144	*Date of Test not given. Weed Seed excessive.
1040	Timothy	Holbrook Grocery Co., Keene, N. H. Benington Hardware Co., Gardner No. 66157.....	L F	99.65 99.77	0.05 0.05	0.11 0.14	0.05 0.04	89.50 69.00	3/1944 8/8/44	Germination below that stated.
154	Mangel	D. Landreth Seed Co., Bristol, Pa. Sunshine Feed Store, Bridgewater Wurzel, Mammoth Long Red, No. A44-1.....	L F	* 99.86	— —	— 0.08	— 0.06	80.00 85.00	1/1944 5/12/44	*Purity required but not given.
1442	Millet	Hungarian.....	L F	* 97.68	* 1.34	— 0.93	— Trace	80.00 90.00	6/1944 8/9/44	*Required information not given.
1443	Sudan Grass	.....	L F	* 97.80	* 0.01	— 0.95	— 1.24	85.00 78.00	5/1944 8/3/44	*Required information not given.
235	Clover	Northrup, King & Co., Minneapolis, Minn. F. W. Woolworth Co., Boston White Dutch, No. CW-3.....	L F	99.25 98.92	0.25 0.05	0.25 0.05	0.25 0.98	87.8 66.31	2/1944 8/10/44	Other Crop Seed excessive. Germination below that stated.
1216	Oats	The O & M Seed Co., Green Springs, Ohio Middlesex County Farm Bureau, Assoc., Worcester *O&M, No. 93 C.....	L F	98.00 97.90	0.40 1.38	0.25 1.12	1.35 0.60	90.00 87.00	1/1944 7/25/44	*Variety required unless there is a statement "Variety Unknown"; O&M not a variety. Weed Seed excessive.
1090	Millet	The Page Seed Co., Greene, N. Y. Hayley's Grain Store, Palmer Hungarian, No. J 6 N 44.....	L F	99.00 99.21	0.80 0.40	0.20 0.39	— —	90.00 76.00	2/1944 8/2/44	Germination below that stated.

Results of Inspection and Analyses of Field Seeds — Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Seed %	Germination %	Date of Test	Violations
1376	Clover	Pedigreed Seed Co., New York, N. Y. S. C. M. Packard, Wareham White, Lot No. WOP	L 98.06 F 96.59	0.20 2.89	— 0.11	1.74 0.41	90.00 84.7	2/1944 8/17/44	Weed Seed excessive.
1110	Buckwheat	Wm. G. Scarlett & Co., Baltimore, Md. Farmers Co-operative Exchange, Framingham Centre *No. 25741	L 98.00 F 99.41	0.50 0.05	1.50 0.24	— 0.30	90.00 88.00	12/1943 7/21/44	*Variety required but not given.
1173	Millet	Haverhill Hardware & Plumbing Supply Co., Haverhill Japanese, No. 26232	L 97.00 F 98.38	1.50 1.19	1.50 0.43	— —	90.00 62.00	5/1944 8/8/44	Germination below that stated.
1172	Redtop	No. 2659	L 94.00 F 91.85	0.50 0.45	5.50 7.70	— —	90.00 89.00	2/1943 8/1/44	Purity below that stated.
1428	Soy Beans	F. H. Sargent & Sons, Brockton *Manchu Type, Yellow	L 98.00 F 98.41	0.50 —	1.50 1.39	— 0.17	90.00 75.00	2/1944 7/20/44	*Variety required; "Type" not acceptable in Mass. Germination below that stated.
1123	Wheat	*Winter, No. 25651	L 98.00 F 99.30	0.50 —	1.50 0.62	— 0.08	85.00 92.00	12/1943 7/26/44	*Variety required; "Winter" not a variety.
1269	Timothy	The Stanford Seed Co., Buffalo, N. Y. Hoosac Valley Coal & Grain Co., Adams No. 2548	L 99.60 F 98.95	0.10 0.10	0.20 0.66	0.10 0.29	90.00 49.00	12/1943 8/7/44	Germination below that stated.
1217	Clover	Clarence J. Howland, No. Brookfield Medium Red, No. 5618	L 99.03 F 98.48	0.45 0.66	0.32 0.09	0.20 0.77	86.7 90.7	12/1943 8/11/44	Noxious weeds not declared, but 10 English Plantain per oz. found.
1218	Timothy	Timothy, No. 2548	L 99.60 F 99.58	0.10 0.05	0.20 0.32	0.10 0.05	90.00 50.00	12/1943 8/16/44	Germination below that stated.
726	Clover	W. N. Potter Grain Stores, Inc., Shelburne Falls Alsike, No. 5698	L 98.00 F 97.87	0.30 0.54	0.37 0.33	1.33 1.26	80.11 84.8	2/1944 8/17/44	Noxious weeds not declared, but 11 English Plantain per oz. found.
1261	Redtop	W. N. Potter Grain Stores, Inc., Williamstown No. 3079	L 90.95 F 91.23	0.24 0.33	8.18 7.79	0.63 0.65	* 90.00	2/1944 8/7/44	*Germination required but not stated.

1298	Timothy	Southbridge Grain Co., Southbridge No. 2431	L F	99.62 99.70	0.05 0.06	0.27 0.18	0.06 0.06	90.00 82.00	3/1944 8/11/44	Germination below that stated.
1330	Clover	Stevens Grain Co., Great Barrington Ladino, No. 3179	L F	99.41 99.22	0.10 0.23	0.45 0.43	0.04 0.12	80-17 90-4	2/1944 8/18/44	Noxious weeds not declared, but 15 English Plantain per oz. found.
980	Clover	Wallace Grain Co., Clinton Medium Red, No. 5724	L F	99.00 98.90	0.30 0.13	0.22 0.40	0.48 0.57	80-10 83-8	2/1944 8/10/44	Noxious weeds not declared, but 8 English Plantain and 2 Dodder per oz. found.
978	Sudan Grass	No. 2369	L F	98.40 95.01	0.04 —	0.65 0.54	0.91 4.45	70.00 76.00	1/1944 8/2/44	Purity below that stated; Other Crop Seed excessive.
1178	Clover	John B. Varick Co., Manchester, N. H. F. X. Robichaud, Methuen	L F	* 99.05	* 0.81	— 0.05	— 0.09	* 95-4	* 8/17/44	*Required information not given.
1056	Clover	Whitney Seed Co., Inc., Buffalo, N. Y. Checkerboard Feed Store, Amherst Ladino No. 5646	L F	94.52 94.49	0.96 1.17	0.69 1.03	3.83 3.31	75-14 58-13	8/1943 8/18/44	Noxious weeds not declared but 33 English Plantain and 8 Dodder per oz. found.
965	Clover	Cover Grain & Feed Co., Lowell Fancy White, No. 56 W 18	L F	99.44 98.54	0.06 1.30	0.02 0.04	0.48 0.12	91.00 96-3	3/1944 8/17/44	Germination below that stated. Weed seed excessive.
1032	Bluegrass	Davis Hardware Co., Gardner Kentucky, No. 36615	L F	90.61 85.32	0.20 0.39	9.14 14.20	0.05 0.09	85.00 81.00	1/1944 7/26/44	Purity below that stated; Inert Matter excessive.
1033	Redtop	No. 40434	L F	94.64 91.48	0.71 0.94	4.55 7.56	0.10 0.02	92.00 88.00	2/1944 8/2/44	Purity below that stated; Inert Matter excessive.
1418	Alfalfa	Herman Davis, Merimac Grimm, No. 21510	L F	99.27 99.45	0.18 0.06	0.05 0.09	0.50 0.40	73-17 61-34	3/1944 8/10/44	Germination below that stated.
1135	Kyegrass	Essex County Co-operative Farming Assoc., Topsfield Domestic, No. 4451	L F	98.92 98.82	0.36 0.22	0.72 0.89	— 0.07	90.00 95.00	2/1944 8/2/44	Noxious weeds not declared but 9 English Plantain per oz. found.
1143	Sudan Grass	No. 3051	L F	98.46 98.34	0.08 —	1.24 1.01	0.22 0.65	80.00 65.00	3/1944 8/3/44	Germination below that stated.
1307	Bluegrass	Frank Howard, Inc., Pittsfield Kentucky, No. 36615	L F	90.61 82.36	0.20 0.24	9.14 17.30	0.05 0.10	85.00 82.00	1/1944 7/27/44	Purity below that stated; Inert Matter excessive.

Results of Inspection and Analyses of Field Seeds — Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Seed %	Germination %	Date of Test	Violations
1362	Clover	Whitney Seed Co., Inc.—Continued Hyannis Hardware Co., Hyannis White, No. 56 W 31.....	L 98.80 F 98.07	0.15 1.68	0.20 0.17	0.85 0.08	90-5 91-5	3 1944 8 31 44	Weed Seed excessive.
1128	Clover	Middlesex County Farm Bureau Assoc., Waltham Alsike, No. 15511.....	L 98.30 F 97.97	0.30 1.08	0.10 0.14	1.30 0.81	78-15 78-17	3 1944 8 18/44	Weed Seed excessive.
1127	Clover	Medium Domestic, No. 50519.....	L 99.52 F 99.66	0.08 0.22	0.10 0.03	0.30 0.09	87-3 85-3	1/1944 8 11/44	Noxious weeds not declared but 59 English Plantain per oz. found.
945	Millet	Palm Grain Co., Lowell Hungarian, No. 4854.....	L 98.00 F 97.52	0.30 2.17	1.50 0.28	0.20 0.03	80.00 82.00	2/1944 8 10/44	Weed Seed excessive.
1384	Clover	Phillips, Bates & Co., Hanover Mammoth Red, No. 5156.....	L 99.28 F 99.36	0.20 0.13	0.30 0.32	0.22 0.19	81-7 70-3	1 1944 8 16 44	Noxious weeds not declared but 18 English Plantain per oz. found. Germination below that stated.
1433	Clover	Pierce Hardware Co., Inc., Taunton Medium Red, No. 50518.....	L 99.22 F 99.15	0.10 0.25	0.45 0.21	0.33 0.39	86-4 86-2	3 1944 8 16 44	Noxious weeds not declared but 51 English Plantain per oz. found.
1434	Clover	White, No. 56 W 31.....	L 98.80 F 98.43	0.15 0.89	0.25 0.36	0.80 0.32	89-4 93-3	3/1944 8 7 44	Noxious weeds not declared but 8 English Plantain per oz. found. Weed Seed excessive.
1012	Corn	United Cooperative Farmers, Inc., Fitchburg Long/yellow Flint, No. 7026.....	L 99.00 F 99.82	-- --	1.00 1.18	-- --	90.00 63.00	3 1944 7 7 44	Germination below that stated.
1403	Clover	S. D. Woodruff & Sons, Orange, Conn. Knight Grain Co., Newburyport Alsike, No. 2114.....	L 98.02 F 98.33	0.20 0.43	0.43 0.46	1.55 0.78	82-5 72-9	2 1944 8 26 44	Germination below that stated.
1276	Millet	Wholesaler Unknown Butler Coal & Grain Co., Adams Hungarian, No. 38-213.....	L * F 98.92	* 0.45	-- 0.63	-- Trace	* 22 00	* * 8 10 44	* Required information not given.

689	Ryegrass	New Style Hardware Co., Roslindale Domestic, No. 3085,	L F	99.06 94.91	0.44 0.89	0.16 4.07	0.13	93.00 87.00	*1944 8/16/44	*Month of Test required but not given. Purity below that stated; Weed, Seed and Inert Matter excessive.
1393	Clover	Sunshine Feed Store, Bridgewater Red, No. B.A. 429,	L F	99.57 98.06	0.20 0.99	0.03 0.38	0.20 0.57	74.22 83.11	4/1944 8/16 44	Purity below that stated; Weed Seed excessive.

Results of Inspection and Analyses of Mixtures — Section 261C

Each Mixture of Agricultural Seeds, except as specified in Section 261B, shall be labeled to show that such seed is a mixture; the name, variety and approximate percentage by weight of each kind present in excess of five percent or more by weight of the total mixture; approximate total percentage by weight of weed seeds; the approximate percentage of germination of each kind present in excess of five percent by weight, together with the month and year said seed was tested; the approximate percentage by weight of inert matter; the name and approximate number per ounce of noxious weed seeds present singly or collectively in excess of one seed in each fifteen grams of such mixture; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Complete analysis is given, but mislabeling, which is indicated by boldface type, is applied only to the items named above.

The name and address of the Wholesaler are printed in boldface type.

Thirty-five mixtures under this section were received but only twenty-four, for which analysis does not conform with labeled information, are shown in this table.

L. b. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
1054	W. E. Aubuchon Co., Inc., Fitchburg, Mass. W. E. Aubuchon Co., Inc., Gardner Evergreen Grass Seed Mixture.....					93.93	* 0.23	* 5.14	0.70	3/1944 7/1944	*Required information not given.
	Ingredients:										
	Kentucky Bluegrass.....	3.56	3.46	62.00	63.00						
	Redtop.....	27.12	26.55	80.00	77.00						
	Timothy.....	60.72	59.35	81.00	51.00						
	Red Clover.....	4.65		70.00							
	White Clover.....		4.57		69.24						
741	Bigelow & Dowse Co., Boston, Mass. H. J. Croreau Hardware Co., Northampton Greenvue Grass Seed Mixture, AMS-33, Lot No. L-X16.....						1.00	13.00	2.50	1/1944	8 Buckhorn - 8 Plantain - 15 Sorrel per oz. 3 English Plantain per oz. found.
	Ingredients:					85.44	0.86	11.30	2.40	7/14/44	Germination below that stated.
	Kentucky Bluegrass.....	12.00	11.42	80.00	70.00						Germination below that stated.
	Redtop.....	21.15	20.58	85.00	87.00						Germination below that stated.
	Timothy.....	14.70	16.06	85.00	53.00						Germination below that stated.
	White Clover.....	1.60	0.80	80.00	70.24						Germination below that stated.
	Common Ryegrass.....	34.65	36.58	90.00	93.00						Germination below that stated.

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Ingredients		Germination		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks	
		Label	Found	Label	Found							
855	Boston Supply Co., Boston, Mass. Pill Hardware Co., Inc., Cambridge Continental Mixture, AMS-43, No. 18-3					L	1.50	17.70	1.50	2/1943		
						F	0.40	16.58	0.73	7/6/44		
		Ingredients:										
		Kentucky Bluegrass	4.00	0.20	65.00	60.00						Percentage below that stated.
		Redtop	4.00	12.52	75.00	85.00						Exceeds percentage stated.
888	Joseph Breck & Sons, Boston, Mass. T. Mark Connelly, Brookline Breck's Good Trade Grass Seed Mixture	Timothy	61.50	55.99	80.00	16.00					Germination and percentage below that stated	
		Domestic Ryegrass	9.80	13.58	90.00	90.00					Exceeds percentage stated.	
		Ingredients:**										
		Kentucky Bluegrass	10.00	21.36	80.00	87.00						Exceeds percentage stated.
		Redtop	25.00	20.89	80.00	84.00						Exceeds percentage stated.
1097	Arthur R. Cone, Buffalo, N. Y. Halley's Grain Store, Palmer Cornell General Pasture Mixture	Timothy	12.00	16.34	90.00	92.00					Percentage below that stated	
		Domestic Ryegrass	50.00	25.25	90.00	90.00					Germination below that stated.	
		White and Alsike Clover	3.00	2.55	89.6	69.29						Germination below that stated.
		Ingredients:										
		Kentucky Bluegrass	25.50	24.94	80.00	83.00						Exceeds percentage stated.
821	Thomas W. Emerson Co., Beverly, Mass. Frank T. Coyle, Melrose Early Green Grass Mixture	Timothy	29.40	28.31	90.00	78.00						
		Ladino Clover	4.90	5.60	70.20	63.12						Germination below that stated.
		Alfalfa	24.50	24.47	80.10	64.7						Germination below that stated.
		Red Clover	9.80	7.80	80.10	60.6						Germination below that stated.
		Ingredients:										
855	Cornell General Pasture Mixture					L	0.50	4.75	0.65	2/1944		
						F	91.12	1.75	5.54	1.59	7/13/44	Weed Seed and Other Crop Seed excessive.
888	Cornell General Pasture Mixture					L	1.00	15.00	—	3/1944		
						F	86.39	0.35	12.79	0.47	7/7/44	Weed Seed and Other Crop Seed excessive.
1097	Cornell General Pasture Mixture					L	0.50	4.75	0.65	2/1944		
						F	91.12	1.75	5.54	1.59	7/13/44	Weed Seed and Other Crop Seed excessive.
821	Cornell General Pasture Mixture					L	0.35	2.91	—	1/1944		
						F	94.50	0.42	4.91	0.17	7/11/44	Inert Matter excessive.

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
1102	John D. Lyon, Inc.—Continued F. Diehl & Son, Inc.—Continued Special Mixture Lawn Grass Seed.....					L 97.80	0.25	1.95	—	1/1944	Given formula exceeds 100% Inert matter excessive.
						F 93.32	0.49	5.35	0.84	6/15/44	
1103	Ingredients: Kentucky Bluegrass..... Redtop, Fancy..... White Clover..... N. Z. Chewings Fescue..... Colonial Bent..... Agrostis spp. (Redtop and Colonial Bent).....	19.70	17.03	87.00	85.00						Germination below that stated. Germination below that stated.
		62.72	—	98.00	—						
1109	Special Mixture..... Ingredients: Redtop, Fancy..... Timothy, Choice..... Alsike Clover..... Medium Red Clover.....	—	65.85	—	92.00	L 97.10	0.40	2.50	—	**	**Required but not stated. Given formula exceeds 100%.
						F 98.77	0.24	0.74	0.25	6/16/44	
1129	Middlesex Co., Farm Bureau Assoc., Waltham, Mass. Haland Mixture No. 1, Light to Med. Soils.....	9.20	9.37	90.00	91.00						Germination below that stated. Germination below that stated. Germination below that stated.
		39.80	40.70	90.00	82.00						
1130	Ingredients: Redtop..... Timothy..... Alsike Clover..... Red Clover..... Sunny Spot Lawn Seed Mixture.....	9.20	7.00	90.00	92.00	L 97.10	0.40	2.50	—	**	**Required but not stated. Given formula exceeds 100%.
		39.80	41.85	90.00	78.00	F 99.25	0.15	0.50	0.10	7/12/44	
1130	Ingredients:** Kentucky Bluegrass..... Redtop, Fancy..... Chewings Fescue..... Colonial Bent..... Domestic Ryegrass..... Agrostis spp..... (Redtop and Colonial Bent)	30 lb.	27.45	85.00	84.00	L 93.00	0.50	6.50	—	**	Percentage less than stated. *Germination required but not stated. *Germination required but not stated.
		25 lb.	—	90.00	78.00	F 93.86	0.41	4.97	0.76	6/20/44	
		20 lb.	16.07	—	—						
		5 lb.	—	90.00	91.00						
		20 lb.	19.31	—	—						
		—	31.03	—	91.00						

987	The Page Seed Co., Greene, N. Y.									
	Felix Hardware Co., Clinton Special Mixture, Page's Finest, No. D144									
	Ingredients:									Germination below that stated.
	Kentucky Bluegrass	8.45	69.00	8.45	0.25	4.40	95.35	0.25	4.40	3/1944
	Redtop	46.77	94.00	46.77	0.35	4.90	94.80	0.35	4.90	6/23/44
	Timothy	11.64	94.00	9.73						
	Domestic Ryegrass	29.89	92.00	30.62						
1359	Lawrence Bros., Falmouth									
	Cornell Hay Pasture Mixture, No. L. 25.284.									
	Ingredients:									
	Kentucky Bluegrass	23.12	80.00	22.17						
	Timothy	35.57	68.00	35.51						
	Ladino Clover	4.40	77-2	4.62						
	Grimm Alfalfa	17.34	50-8	17.34						
	Meduna Red Clover	8.91	46-3	9.08						
	Alsike Clover	4.40	52-9	5.03						
876	Philadelphia Seed Co., Philadelphia, Pa.									
	Phil Hardware & Supply Co., Cambridge Lawn Mixture, No. 583									
	Ingredients:									
	Kentucky Bluegrass	4.00	50.00	1.12						
	Redtop	16.75	80.00	13.46						
	Timothy	48.00	80.00	52.56						
	Domestic Ryegrass	14.30	90.00	12.00						
885	West Roxbury Hardware, West Roxbury									
	Old English Mixed Lawn Seed, No. 683									
	Ingredients:									
	Kentucky Bluegrass	30.00	75.00	28.69						
	Redtop, Fancy	30.50	90.00							
	White Clover	2.00	55-30	1.96						
	Common Ryegrass	21.75	94.00	24.25						
	Creeping Bent	5.00	85.00							
	Agrostis spp.		85.00	34.52						
	(Redtop & Creeping Bent)									
856	Philadelphus Seed Co., Philadelphia, Pa.									
	Phil Hardware & Supply Co., Cambridge Lawn Mixture, No. 583									
	Ingredients:									
	Kentucky Bluegrass	4.00	50.00	1.12	1.05	15.30	70.14	1.05	15.30	12/1942
	Redtop	16.75	80.00	13.46	0.65	17.88		0.65	17.88	6/9/44
	Timothy	48.00	80.00	52.56						
	Domestic Ryegrass	14.30	90.00	12.00						
	Noxious weeds									Not declared but
	7 English Plantain per oz.									found.
	Other Crop Seed excessive.									
	Percentage below that stated.									
885	West Roxbury Hardware, West Roxbury									
	Old English Mixed Lawn Seed, No. 683									
	Ingredients:									
	Kentucky Bluegrass	30.00	75.00	28.69	0.50	8.00	89.42	0.50	8.00	1/1944
	Redtop, Fancy	30.50	90.00		0.44	6.85		0.44	6.85	6/23/44
	White Clover	2.00	55-30	1.96						
	Common Ryegrass	21.75	94.00	24.25						
	Creeping Bent	5.00	85.00							
	Agrostis spp.		85.00	34.52						
	(Redtop & Creeping Bent)									

** Formula given in pounds rather than percentage of pure seed, by weight, as required.

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
1437	Wm. G. Scarlett & Co., Baltimore, Md.										
	Farm Service Store, Leominster										
	Greenway Lawn Seed Mixture, No. 25459			L	F	88.44	0.50	9.75	0.10	6/1944	
	Ingredients:										
	Kentucky Bluegrass	40.50	39.27	75.00	75.00						
	Redtop	28.00	—	90.00	90.00						
	White Clover	1.90	2.49	80.00	70.29						
	Chewings Fescue	4.85	4.61	80.00	58.00						
	(*)Bent	4.60	—	90.00	—						
	(*)Ryegrass	9.80	—	90.00	—						
Domestic Ryegrass	9.45	—	—	91.00						Germination below that stated. Germination below that stated. *"Bent" and "Ryegrass" not sufficient.	
Agrostis spp.	—	32.62	—	92.00						Domestic Ryegrass and Creeping Bent found.	
(Redtop & Creeping Bent)											
1113	Farmers' Cooperative Exchange, Framingham										
	Shady Spot Lawn Seed Mixture, No. 25006			L	F	91.16	0.50	7.05	0.05	2/1944	
	Ingredients:										
	Kentucky Bluegrass	16.00	16.04	80.00	79.00						
	Redtop	17.60	16.28	90.00	88.00						
	Chewings Fescue	39.20	39.20	85.00	66.00						
	(*)Ryegrass	19.60	—	90.00	—						
	Domestic Ryegrass	—	22.04	—	87.00						Germination below that stated. *"Ryegrass" not sufficient; Domestic Ryegrass found.
	(*)Ryegrass	—	—	—	—						
	Domestic Ryegrass	—	—	—	—						
921	Sears, Roebuck & Co., Chicago, Ill.										
	Sears, Roebuck & Co., Brockton										
	Garden Master Shady Mixture, No. O.D.18			L	F	90.70	0.50	6.65	1.00	1,1944	
	Ingredients:										
	Kentucky Bluegrass	29.75	27.68	80.00	62.00						Germination below that stated.
	Redtop	18.00	17.64	90.00	86.00						
	Chewings Fescue	24.50	23.71	80.00	42.00						Germination below that stated.
	Domestic Ryegrass	14.70	17.10	90.00	96.00						
	Meadow Fescue	4.90	4.57	90.00	70.00						Germination below that stated.
	(*)Ryegrass	—	—	—	—						

Western Auto Supply Co., Kansas City, Mo.

Western Auto Stores, Quincy

Sturdi-Gro Estate Grass Seed, Grade D, AMS-6, No. L A 82.....

L F

93.34

0.72
0.446.70
6.080.10
0.143/1944
7/12/4415 Sorrel — 15 Dock — 30 Buck-
horn per lb.
2 English Plantain per oz. found.

Ingredients:

Kentucky Bluegrass.....	15.04	12.82	80.00	60.00
Redtop, Fancy.....	31.76	36.56	90.00	46.00
Timothy.....	14.98	12.49	85.00	60.00
White Clover.....	1.00	78-14	62-10	
Domestic Ryegrass.....	29.70	30.46	90.00	97.00

Whitmore Hardware Co., Melrose, Mass.

My Best Shady Mixture.....

L F

98.29

0.04
0.452.80
1.19—
2/1944
7/11/44Percentage below that stated.
Exceeds percentage stated.

Declared but not found.

Ingredients:

Kentucky Bluegrass.....	34.40	20.84	80.00	78.00
Redtop.....	24.20	43.54	85.00	90.00
Chewings Fescue.....	29.20	33.91	75.00	93.00
Perennial Ryegrass.....	9.00	—	80.00	—

F. H. Woodruff & Sons, Milford, Conn.

Pope Lumber Co., West Roxbury

Shady Spot G-12-225.....

L F

88.26

0.50
0.228.60
10.36—
2/1944
6/7/44

Germination below that stated.

Germination and percentage below
that stated.

Ingredients:

Kentucky Bluegrass.....	21.00	22.48	80.00	68.00
Redtop.....	21.40	26.05	90.00	85.00
Chewings Fescue.....	24.00	14.35	70.00	56.00
Common Ryegrass.....	24.50	25.38	90.00	93.00

676

816

881

Results of Inspection and Germination of Vegetable Seeds Section 261D

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety; the percentage of germination, with the month and year tested, provided the germination is below the Massachusetts Standard; and the name and address of the vendor, packer, or processor.

Eight hundred and eighty-seven samples of vegetable seeds were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of the law. Thirty samples, not shown in the table, were found to be above standard and thus complied with the law but were below the germination stated on the label.

Mislabeled with respect to any of the requirements listed above is indicated by boldface type, and the wholesaler's name is in boldface type. "Wholesaler Unknown" is applied to samples of seed which were purchased for a previous season's sale but were offered for sale during the current season without having been retested.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Associated Seed Growers, Inc., New Haven, Conn.							
1409	Cauliflower	Martin W. Dugan Co., Newburyport Early Snowball.....	—	—	48	July	75
671	Corn	Shurtleff Hardware Co., Middleboro Hybrid Marcross.....	—	—	60	June	75
Joseph Breck & Sons, Boston, Mass.							
494F	Turnip	Franklin Hardware and Plumbing Supply Co., Franklin (a) Improved American Purple Top.	—	—	95	June	80
1387	Parsnip	T. L. McGrath, Hardware, Whitman Long Smooth White.....	—	—	40	July	60
Comstock, Ferre & Co., Wethersfield, Conn.							
299F	Beet	Franklin Hardware Co., No. Attleboro Early Wonder.....	—	—	55	May	65
1176	Pepper	F. X. Robichaud, Methuen Bell or Bull Nose.....	50	12/1943	21	June	55
Arthur R. Cone, Buffalo, N. Y.							
532	Cabbage	Northboro Hardware Co., Northboro Danish Ball Head, Short Stem.	85	1944	65	May	75
Crosman Seed Corp., East Rochester, N.Y.							
198	Onion	S. S. Kresge Co., Brockton Yellow Globe Danvers, No. 135.....	70	1/1944	50	May	70
Eastern States Farmers' Exchange, Springfield, Mass.							
1327	Parsnip	Eastern States Farmers' Exchange, Great Barrington Model, No. 814.....	75	1/1944	36	July	70
Thomas W. Emerson Co., Beverly, Mass.							
325	Onion	Barrett Hardware Co., Fall River Red Globe.....	—	—	11	May	70
682	Kale	F. W. Carson Co., Quincy Dwarf Curled Scotch.....	—	—	5	May	75
1365	Turnip	Central Hardware Co., Hyannis (a) Macomber.....	—	—	89	July	80
J. H. Chandler & Son, Inc., Newton Centre							
589	Chicory	Witloof French Endive.....	—	—	36	May	65
588	Lettuce	New York.....	—	—	40	May	80

(a) A Rutabaga incorrectly labeled Turnip.

Results of Inspection and Germination of Vegetable Seeds
Section 261D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Thomas W. Emerson Co., Continued							
Chittick's Farm Supply Store, So. Hamilton							
897	Lettuce	New York.....	—	—	38	June	80
900	Pepper	Pickling or Squash.....	—	—	33	June	55
G. W. Gardiner & Sons, Fall River							
327	Leek	(*).....	—	—	64	May	60
J. B. Hunter Co., Inc., Boston							
59	Cauliflower	Snowball.....	—	—	61	May	75
Jordan-Marsh Co., Boston							
46	Beet	Extra Early Dark Egyptian.....	—	—	46	April	65
47	Cabbage	Red Dutch.....	—	—	52	May	75
48	Celery	Boston Market.....	—	—	37	May	55
52	Lettuce	New York.....	—	—	42	May	80
Liggett's Drug Store, Malden							
259	Parsnip	Hollow Crown.....	—	—	45	April	60
Liggett's Drug Store, Newton Corners							
363	Cabbage	All Season.....	—	—	49	May	75
364	Celery	Boston Market.....	—	—	43	July	55
365	Lettuce	New York or Wonderful.....	—	—	51	April	80
Norfolk Paint & Varnish Co., Hyannis							
1369	Celery	Boston Market.....	—	—	14	July	55
1370	Lettuce..	New York or Wonderful.....	—	—	37	July	80
Norwood Hardware & Supply Co., Norwood							
795F	Beans	Burpee's Bush Lima.....	—	—	55	June	70
Poole & Blodgett Co., Danvers							
229	Lettuce	Black Seeded Tennisball.....	—	—	67	May	80
Salem Hardware Co., Salem							
868	Lettuce	May King.....	—	—	34	June	80
The Thompson Hardware Co., Lowell							
951	Spinach	King of Denmark.....	—	—	49	June	60
Waldron Hardware Co., Taunton							
81	Cabbage	All Season.....	—	—	58	May	75
82	Cabbage	Early Jersey Wakefield.....	—	—	63	May	75
Worcester Grain & Coal Co., Worcester							
550F	Beet	Extra Early Dark Egyptian.....	—	—	50	May	65
Yankee Mafid Products, Inc., Boston							
243	Cabbage	Stone Mason Drumhead.....	—	—	28	May	75
248	Celery	Golden Self Blanching.....	—	—	35	June	55
245	Pepper	Harris Giant.....	—	—	32	May	55
Thomas J. Grey Co., Boston, Mass.							
109	Beans	Round Pod Kidney Wax.....	—	—	65	June	80
Charles C. Hart Seed Co., Wethersfield, Conn.							
383F	Beet	Downey & Howland Co., Fall River Early Wonder.....	75	1/1944	51	May	65
Budd D. Hawkins, Reading, Vt.							
I. B. Barrows, Worcester							
554	Onion	Yellow Globe Danvers.....	—	—	27	May	70
555	Onion	Large Red Wethersfield.....	—	—	32	May	70
Gruener Hardware Store, Inc., Fitchburg							
1	Broccoli	Italian Green Sprouting.....	—	—	47	May	75
2	Cabbage	True Early Winningstadt.....	—	—	54	May	75
3	Cabbage	Hollander or Danish Ball Head.....	—	—	53	May	75
5	Celery	New White Plume.....	—	—	27	May	55
6	Dandelion	Improved Thick Leaved.....	—	—	22	April	45
8	Lettuce	Extra Early Tennisball or Boston Market.....	—	—	53	May	80

(*) Variety required but not given

Results of Inspection and Germination of Vegetable Seeds
Section 261D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Budd D. Hawkins, Continued							
		Gruener Hardware Store, Inc., Con.					
9	Onion	Yellow Globe Danvers.....	—	—	36	April	70
10	Onion	Large Red-Wethersfield.....	—	—	0	April	70
11	Parsnip	Improved Hollow Crown.....	—	—	46	April	60
12	Turnip	Orange Jelly or Golden Ball.....	—	—	12	May	80
776	Dandelion	Home Supply Co., Orange Improved Thick Leaved.....	—	—	15	July	45
535F	Turnip	Northboro Hardware Co., Northboro (a) New White Sweet German.....	—	—	61	June	80
758	Lettuce	N. F. Spencer, So. Deerfield Extra Early Tennisball or Boston Market.....	—	—	50	June	80
15	Beans	Ward Paint Store, Fitchburg Improved Golden Wax.....	—	—	61-8	May	80
16	Cabbage	Budd's Genuine Surehead.....	—	—	46	May	75
17	Cabbage	Mammoth Red Rock.....	—	—	53	May	75
26	Turnip	(a) New White Sweet German.....	—	—	58	May	80
27	Turnip	New White Egg.....	—	—	14	June	80
D. Landreth Seed Co., Bristol, Pa.							
555F	Beans	Baker Hardware Co., Wellesley Black Valentine Stringless.....	90	3/1944	65	June	80
147F	Beet	Sunshine Feed Store, Bridgewater Crosby's Egyptian.....	80	1/1944 or better	47	May	65
The Page Seed Co., Greene, N. Y.							
657F	Rutabaga	J. H. Fairbanks Co., Bridgewater (*) Yellow, No. Y5-9044.....	85	1/1944	95	May	75
658F	Rutabaga	(*) Lot No. V6-1344.....	85	1944	81	June	75
1295	Beans.....	Gatzke Hardware Co., Webster Improved Golden Wax.....	—	—	24	July	80
1293	Parsley	Hamburg Rooted No. C 13-7544.....	80	1/1944	18	June	60
Perry Seed Co., Boston, Mass.							
414	Onion	Danvers Yellow Globe, No. 4585.....	—	—	51	May	70
Ralston Purina Co., St. Louis, Mo.							
222F	Beet	Parker Farm Supply Store, Danvers Crosby's Early Egyptian.....	—	—	39	May	65
1250 $\frac{3}{4}$	Parsnip	Checkerboard Feed Store, Spencer Hollow Crown.....	—	—	28	June	60
Jerome B. Rice Seed Co., Cambridge, N. Y.							
527F $\frac{2}{3}$	Beet	Glendale Hardware Co., Everett Crosby's Egyptian.....	65	12/1944	51	July	65
J. B. Rice Jr., Inc., Shushan, N. Y.							
773	Brussels Sprouts	C. L. Cook's Hardware, Millers Falls (*).....	App. 55	11/1943	61	June	70
772	Cabbage	Mammoth Red Rock.....	46	11/1943	30	June	75
Ross Bros. Co., Worcester, Mass.							
460	Beet	Economy Hardware Co., Milford..... Crosby's Egyptian.....	72	1/1944	36	May	65
1363	Beans	Hyannis Hardware Co., Hyannis Improved Golden Wax.....	—	—	65-4	July	80
Rudy-Patrick Seed Co., Kansas City, Mo.							
842	Lettuce	Western Auto Associated Store, Plymouth Big Boston, No. 3258.....	80+	1/1944	53	June	80

(a) A Rutabaga incorrectly labeled Turnip.

(*) Variety required but not given

Results of Inspection and Germination of Vegetable Seeds
Section 261D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
112	Cabbage	Joseph Sordillo & Sons, Boston, Mass.					
113	Onion	Fottler's Improved Brunswick	—	—	51	May	75
		White Globe	—	—	0	April	70
		The Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission)					
509	Cabbage	Lincoln Junior High School, Malden	—	—	92	May	75
502F	Spinach	*Late Long Standing Bloomsdale, No. 4047	—	—	1	May	60
		John B. Varick Co., Manchester, N. H.					
1416	Lettuce	Amesbury Hardware Co., Amesbury	—	—	66	July	80
		Prizehead	—	—			
		F. H. Woodruff & Sons, Milford, Conn.					
77	Lettuce	Waldron Hardware Co., Taunton	—	—	69	May	80
		Big Boston, No. 19896 C	—	—			
		S. B. Woodruff & Sons, Orange, Conn.					
309F	Turnip	Monroe Seed Market, Attleboro	60	11 1943	99	June	80
		(a) Macomber, No. 2621	—	—			
		²⁸³ Wholesaler Unknown					
683F	Turnip	F. W. Carson Co., Quincy	—	—	80	June	80
		(a) Sweet German	—	—			
610	Dandelion	Central Hardware Co., Woburn	—	0 1943	11	June	45
		Thick Leaf	—	—			
893F	Radish	Danvers Hardware Co., Danvers	—	—	63	June	75
		Scarlet Globe	—	—			
1341	Lettuce	Depping & Moore, Inc., Westfield	—	—	65	July	80
		Iceberg	—	—			
1334	Onion	Dresser-Hull Co., Lee	—	—	31	July	70
		Red Wethersfield	—	—			
1407	Cabbage	Martin W. Dugan Co., Newburyport	—	—	50	July	75
		Red Rock	—	—			
495	Cabbage	Franklin Hardware & Plumbing Supply Co., Franklin	—	—	21	May	75
		Dwarf Flat Dutch	—	—			
1401	Cabbage	John W. Goodhue Corp., Ipswich	—	—	0	July	75
		Fottler's Brunswick	—	—			
869	Lettuce	B. F. Hill Co., Salem	—	—	44	June	80
		Tennisball, Black Seeded, No. 1-4340C	—	—			
482F	Cabbage	L. N. Jaques, Milford	—	—	31	May	75
		Stone Mason	—	—			
1388	Lettuce	T. L. McGrath, Hardware, Whitman	—	—	20	July	80
		Iceberg	—	—			
453	Peas	Charles A. Smith Co., Millis	—	—	55	June	80
		Nott's Excelsior	—	—			
814	Cabbage	George H. Taylor Co., Wakefield	—	—	50	July	75
815	Turnip	Improved Savoy	—	—	51	June	80
		Purple Top Strap Leaf	—	—			
1099	Turnip	Arthur S. Tucker, Warren	—	—	1	June	80
		Yellow Globe	—	—			
79	Lettuce	Waldron Hardware Co., Taunton	—	—	52	April	80
		Paris White Cos Romaine	—	—			
447	Corn	Westwood Hardware & Supply Co., Westwood	—	—	41	June	75
		Golden Bantam	—	—			

(a) A Rutabaga incorrectly labeled Turnip.

*Variety required but not given.

** Wholesaler not named because retailer admits, or wholesaler claims, that the following lots of vegetable seeds were not purchased by the retailer during the current year.

Summary of Inspection

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Apothecaries Hall Co., Waterbury, Conn.				1	1	0			
Associated Seed Growers, Inc., New Haven, Conn.	40	38	2	3	1	2			
Aubuchon, A. W., & Co., Fitchburg, Mass.							1	0	1
Bailey, E. W., & Co., Montpelier, Vt.				1	1	0			
Barber & Bennett, Inc., Albany, N. Y.				2	2	0			
Belt Seed Co., The Baltimore, Md.				1	1	0	1	0	1
Bigelow & Dowse Co., Boston, Mass.							1	0	1
Boston Supply Co., Boston, Mass.							1	0	1
Breck, Joseph, & Sons, Boston, Mass.	45	43	2	18	14	4	2	1	1
Brown, Alfred & Son, Grand Rapids, Mich.	1	1	0						
Burpee, W. Atlee, & Co., Philadelphia, Pa.	33	33	0				1	1	0
Comstock, Ferre & Co., Wethersfield, Conn.	60	58	2	4	3	1			
Cone, Arthur R., Buffalo, N. Y.	11	10	1	45	28	17	1	0	1
Cover Grain Co., Lowell, Mass.				1	1	0			
Cox, Charles M., Co., Boston, Mass.				1	1	0			
Craver-Dickinson Co., Chicago, Ill.				7	6	1			
Crosman Seed Corp., East Rochester, N. Y.	15	14	1						
Dickinson, Albert, Co., Chicago, Ill.				8	6	2			
Dyer, Inc., New York, N. Y.	5	5	0						
Duryea Seed Co., New York, N. Y.				2	2	0			
Eastern States Farmers' Exchange Springfield, Mass.	25	24	1	20	19	1	1	1	0
Edgewood Farms, Inc., Edgewood, N. J.							1	1	0
Emerson, Thomas W., Co., Beverly, Mass.	93	64	29				2	1	1
Empire Seed Co., Fredonia, N. Y.	11	11	0						
Essex County Cooperative Farming Assoc., Topsfield, Mass.							1	0	1
Ferry-Morse Seed Co., Detroit, Mich.	13	13	0						

Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Franklin, Ben, Stores. Chicago, Ill.	7	7	0						
Fraser's. Wellesley, Mass.	5	5	0						
Fredonia Seed Co. Fredonia, N. Y.	8	8	0						
Garfield Williamson Co. Jersey City, N. J.							1	1	0
Grey, Thomas J., & Co. Boston, Mass.	15	14	1						
Harris, Joseph, & Co. Rochester, N. Y.	10	10	0						
Hart, Charles C., Seed Co. Wethersfield, Conn.	66	65	1	4	1	3			
Hawkins, Budd D. Reading, Vt.	46	26	20						
Herbst Bros. New York, N. Y.	1	1	0						
Holbrook Grocery Co. Keene, N. H.				3	2	1			
Hygrade Seed Co. Fredonia, N. Y.	10	10	0						
Johnson, J. Oliver, & Co. Chicago, Ill.							1	0	1
Kingston Hardware Co. Kingston, Mass.							1	0	1
Knight, E. W. Newburyport, Mass.	1	1	0						
Landreth, D., Seed Co. Bristol, Pa.	31	29	2	7	5	2			
Larrowe Buckwheat Co. Cohocton, N. Y.				1	1	0			
Lyon, John D., Inc. Belmont, Mass.	2	2	0	3	3	0	3	0	3
Mandeville & King Co. Rochester, N. Y.	4	4	0						
Merrimac Valley Nurseries. Merrimac, Mass.	2	2	0						
Michael-Leonard Seed Co. Chicago, Ill.	19	19	0						
Middlesex County Farm Bureau Assoc. Waltham, Mass.							2	0	2
Northrup, King & Co. Minneapolis, Minn.	14	14	0	1	0	1			
O & M Seed Co. Green Springs, Ohio				3	2	1			
Page Seed Co. Greene, N. Y.	37	33	4	12	11	1	2	0	2
Pedigreed Seed Co. New York, N. Y.				1	0	1			
Perry Seed Co. Boston, Mass.	16	15	1						
Philadelphia Seed Co. Philadelphia, Pa.							2	0	2
Ralston Purina Co. St. Louis, Mo.	14	12	2	1	1	0			

Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Reist Seed Co. Lancaster, Pa.				2	2	0			
Rice, J. B., Jr., Inc. Shushan, N. Y.	8	6	2						
Rice, Jerome B., Seed Co. Cambridge, N. Y.	5	4	1				1	1	0
Ross Bros. Co. Worcester, Mass.	17	15	2	2	2	0			
Rudy-Patrick Co. Kansas City, Mo.	21	20	1						
Scarlett, Wm. G., & Co. Baltimore, Md.				21	16	5	2	0	2
Sears, Roebuck & Co. Chicago, Ill.	13	13	0	1	1	0	2	1	1
Sordillo, Joseph, & Sons Boston, Mass.	6	4	2						
Stanford Seed Co. Buffalo, N. Y.				29	20	9			
Templin Bradley Co. Cleveland, Ohio	20	18	2						
Transcontinental Seed Co. New York, N. Y.				3	3	0			
Varick, John B., Co. Manchester, N. H.	5	4	1	1	0	1			
Vaughan Seed Store New York, N. Y.	2	2	0						
Western Auto Supply Co. Kansas City, Mo.							1	0	1
Whitmore Hardware Co. Melrose, Mass.							1	0	1
Whitney Seed Co. Buffalo, N. Y.				39	23	16			
Woodruff, F. H., & Sons Milford, Conn.	76	75	1	5	5	0	1	0	1
Woodruff, S. D., & Sons Orange, Conn.	37	36	1	3	2	1			
Wood, T. W., & Sons Richmond Va.				1	1	0			
Unknown	17	0	17	5	2	3	2	1	1
Totals	887	788	99	262	189	73	45	9	26

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted in Conjunction with the Department of Olericulture

Grant B. Snyder, Professor

Again this year, as in previous years, tests were conducted by the Experiment Station to determine the trueness to type of vegetable seeds that are offered for sale by the seedsmen in Massachusetts. In the spring of 1944, 54 samples of Beans, 60 of Beets, 56 of Carrots, 47 of Corn, 54 of Onions, 46 of Radish, 43 of Rutabaga, 48 of Spinach and 45 of Turnip were purchased on the open market by state inspectors of the Department of Agriculture and sent to the Experiment Station at Amherst, where the Department of Olericulture planted the seed in field test plots in order to compare plant characteristics with the labeled variety name.

The soil of the test plot is a fine, sandy loam and is in a high state of fertility. The land was well prepared and a 5-8-7 fertilizer at the rate of 1500 pounds per acre was applied broadcast and harrowed into the soil prior to seeding. Growth and development was very satisfactory except for the turnips, the foliage of which was severely infested by aphids, resulting in crop failure. Onion seed arrived too late in the season for this year's trials.

Yields of the various crops were not determined because of the necessity of using small plots and also because so many strains and varieties were compared that replication of the plantings was not feasible. Conformity to type has been the measure of comparison in these tests and individual plants have been called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration.

In studying the performance records it becomes evident that all but a few of the stocks were true to name and description and most of them were highly productive. A few of the lots germinated very poorly or not at all, resulting in few or no plants, so that records from these lots were impossible. In a few instances it appeared that the variety had been misnamed or misrepresented but fortunately they were reasonably good substitutions.

The source of the seed and the laboratory germination is given together with remarks on conformity to type, except that those lots of seed which were tested in the field and were found 100% true-to-type are not included in this table.

Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., New Haven, Conn.				
355 F	Carrot	Arlington Hardware Co., Arlington	93	2% Cylindrical
353 F	Radish	Danvers Half Long..... Early Scarlet Globe.....	92	8% Long tapering
Middlesex Supply Co., Lowell				
693 F	Carrot	Chantenay.....	96	4% Stump rooted
W. G. Pearce & Co., Fall River				
333 F	Carrot	Imperator.....	96	4% Stump rooted
336 F	Radish	Early Scarlet Globe.....	94	6% Long tapering
Joseph Breck & Sons, Boston, Mass.				
271 F	Beet	Early Wonder, No. 5274-16.....	96	4% Flat
273 F	Radish	Early Scarlet Globe, No. 6764.....	97	3% Long tapering
Hutchinson Hardware Co., Lynn				
857 F	Beans	Stringless Green Pod.....	84	18% Flat podded
John E. Jordan Co., Plymouth				
848 F	Rutabaga	White Sweet German.....	93	2% American Purple Top
Charles A. Smith, General Stores, Millis				
452 F	Beet	Crosby's Egyptian.....	94	4% Oblong - 2% spindle
R. V. Veoman, Wellesley Hills				
586 F	Rutabaga	Improve 1 American.....	—	This is a mixture of rutabaga and turnip.
W. Atlee Burpee Co., Philadelphia, Pa.				
W. H. Casey Store, Inc., Milford				
469 F	Spinach	Bloodsdales Reselected.....	96	4% Thick leaved
Harding Street Grain Store, Worcester				
539 F	Beet	Crosby's Egyptian.....	98	2% Spindle
Schofield Hardware Co., No. Attleboro				
290 F	Beet	improved Blood Turnip.....	94	6% Long top
288 F	Carrot	Red Cored Chantenay.....	96	4% Half long
Comstock Ferre & Co., Wethersfield, Conn.				
Bell Hardware Co., Stoneham				
594 F	Carrot	Hutchinson.....	96	4% Short stump rooted
W. F. Flynn & Sons, Attleboro				
305 F	Beet	Eclipse—Blood Turnip.....	92	8% Spindle
Franklin Hardware Co., No. Attleboro				
299 F	Beet	Early Wonder.....	94	6% Spindle
G. W. Gardiner & Sons, Fall River				
331 F	Beet	Crosby's Egyptian.....	96	2% Green tops - 2% spindle
329 F	Spinach	Savoy Leaved Long Standing.....	97	3% Thick leaved
F. P. Mills, Campello				
211 F	Beet	Detroit Dark Red.....	97	3% Flat roots
213 F	Radish	Early Scarlet Globe.....	95	5% Long tapering
Arthur R. Cone, Buffalo, N. Y.				
Northboro Hardware Co., Northboro				
529 F	Beet	Detroit Dark Red Perfection.....	94	2% Long — 4% flat
Crosman Seed Corp., East Rochester, N.Y.				
S. S. Kresge Co., Brockton				
203 F	Beans	Stringless Green Pod, No. 354.....	96	4% Flat podded
196 F	Beet	Crosby's Early Egyptian, No. 102½.	94	6% Top shaped
Eastern States Farmers' Exchange, Springfield, Mass.				
Eastern States Farmers' Exchange, Waltham				
133 F	Beet	Crosby (Early Wonder) No. 323.....	98	2% Spindle
136 F	Radish	Early Scarlet Globe, No. 19013.....	98	2% Long tapering

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
		Thomas W. Emerson Co., Beverly, Mass.		
322 F	Beet	Barrette Hardware Co., Fall River Early Blood Turnip	92	2% Long Top - 6% oblong
485 F	Carrot	Henry Patrick & Co., Hopedale Long Orange	96	4% Light lemon color
226 F	Beet	Poole & Blodgett Co., Danvers Detroit Dark Red	96	4% Long tops
865 F	Rutabaga	Salem Hardware Co., Salem Sweet German	98	2% American Purple Top
592 F	Beet	Stoneham Paint & Hardware Co., Stoneham Early Wonder	93	2% Long tops
949 F	Radish	The Thompson Hardware Co., Lowell Scarlet Globe	98	2% Long tapering
236 F	Beet	Yankee Maid Products, Inc., Boston Early Eclipse	98	2% Flat
239 F	Radish	French Breakfast	98	2% Long tapering white root
		Empire Seed Co., Fredonia, N. Y.		
1014 F	Carrot	John B. Carbone & Co., Gardner Chantenary	91	3% Long - 2% medium cylindrical - 4% med. half long
		Ferry-Morse Seed Co., Detroit, Mich.		
877 F	Beet	Dine Hardware Co., Inc., Hyde Park Detroit Dark Red - Ferry's Strain	96	4% Spindle
450 F	Spinach	Westwood Hardware & Supply Co., Westwood Savoy Leaved or Bloomsdale	96	4% Thick leaved
		Ben Franklin Stores, Chicago, Ill.		
765 F	Radish	Ben Franklin Store, Turners Falls Scarlet Globe, No. 56X-597	94	6% Long tapering
439 F	Beet	Ben Franklin Store, Walpole Crosby's Egyptian, No. 56X-77	96	2% Long top - 2% spindle
440 F	Carrot	Chantenary	88	12% Half long
438 F	Spinach	Bloomsdale Long Standing No. 56X-623	98	2% Thick leaved
		Fredonia Seed Co., Fredonia, N. Y.		
662 F	Beet	Sturgis Hardware Co., Middleboro Early Eclipse	88	12% Top shape
663 F	Carrot	Chantenary	96	4% Half long
		Charles C. Hart Seed Co., Wethersfield, Conn.		
600 F	Beet	H. H. Blye & Co., Inc., Woburn Crosby's Egyptian	92	6% Spindle - 2% obovate
441 F	Rutabaga	Cleveland Hardware Co., Walpole American Purple Top Yellow	96	4% White roots
386 F	Radish	Downey & Howland, Fall River, White Tipped Scarlet	96	4% Oblong
284 F	Beet	Foxboro Supply Co., Foxboro Dewing's Extra Early	96	4% Spindle shape
282 F	Radish	White Tipped Scarlet Turnip	98	2% Long tapering
652 F	Rutabaga	C. F. Jordan Hardware, Bridgewater Macomber	98	2% Purple Top
668 F	Corn	Saunders Hardware & Paint Co., Middleboro Hybrid Marcross	—	This is not Marcross or else it is an exceptionally poor strain

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
		Charles C. Hart Seed Co., Continued		
596 F	Carrot	Willis Hardware Store, Stoneham Improved Long Orange.....	92	8% Light lemon color
		Budd D. Hawkins, Reading, Vt.		
552 F	Beet	I. B. Barrows & Co., Worcester Crosby's Egyptian.....	92	8% Spindle
		Hygrade Seed Co., Fredonia, N. Y.		
155 F	Beet	Union Street School, Middleboro Detroit Dark Red.....	96	4% Flat roots
156 F	Beet	Crosby's Egyptian.....	90	10% Long top shaped
157 F	Carrot	Chantenay, Improved Type.....	92	8% Half long
158 F	Radish	Early Scarlet Globe.....	97	3% Long tapering
160 F	Spinach	Bloomsdale Long Standing.....	97	3% Thick leaved
		D. Landreth Seed Co., Bristol, Pa.		
584 F	Beet	Baker Hardware Co., Wellesley Landreth's Best A-871.....	98	2% Long top
		Newton Corner Hardware Co., Newton Corner		
368 F	Beet	Detroit Dark Red.....	96	4% Long top
		Sunshine Feed Store, Bridgewater		
147 F	Beet	Crosby's Egyptian.....	98	2% Long top
149 F	Radish	Early Scarlet Globe.....	94	4% Oblong-2% long tapering
152 F	Spinach	Bloomsdale Long Standing.....	95	5% Thick leaved
		Mandeville & King Co., Rochester, N. Y.		
251 F	Spinach	Zilen's Department Store, Randolph Bloomsdale Savoy Leaved.....	98	2% Thick leaved
		Michael-Leonard Seed Co., Chicago, Ill.		
465 F	Beet	W. E. Anbuchon Co., Inc., Milford Detroit Dark Red.....	96	4% Flat
		Northrup, King & Co., Minneapolis, Minn.		
123 F	Radish	F. W. Woolworth Co., Boston Early Scarlet Globe.....	96	4% Long tapering
234 F	Radish	Early Scarlet Turnip, White Tip Sparkler.....	96	4% Long tapering
		The Page Seed Co., Greene, N. Y.		
396 F	Radish	Lemlin Hardware Co., New Bedford Early Scarlet White Tipped.....	98	2% Oblong
		Perry Seed Co., Boston, Mass.		
418 F	Carrot	Chantenay, No. 2056.....	96	4% Half long
416 F	Radish	Early Scarlet Globe, No. 5826.....	94	6% Long tapering
		Ralston Purina Co., St. Louis, Mo.		
222 F	Beet	Parker Farm Supply Store, Danvers Crosby's Early Egyptian.....	92	8% Spindle
		J. B. Rice, Jr., Inc., Shushan, N. Y.		
950 F	Carrot	The Thompson Hardware Co., Lowell Long Orange Improved, No. 157....	97	4% Very light yellow
		Jerome B. Rice Seed Co., Cambridge, N. Y.		
527 F	Beet	Glendale Hardware Co., Everett Crosby's Egyptian.....	94	4% Oblong — 2% spindle
		Lake Hardware Co., Arlington		
351 F	Beet	Crosby's Egyptian.....	94	2% Spindle - 2% top shape - 2% oblong
		Ross Bros. Co., Worcester, Mass.		
460 F	Beet	Economy Hardware Co., Milford Crosby's Egyptian.....	86	14% Flat
461 F	Carrot	Chantenay.....	—	This is a bad mixture of apparently several varieties
		F. A. Gould Hardware Co., Milford		
481 F	Corn	Whipple's Early Yellow.....	—	This is not Whipple's but looks like a red tasseled strain of Golden Cross

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Rudy-Patrick Seed Co., Kansas City, Mo.				
Western Auto Associate Store, Mansfield				
909 F	Carrot	Chantenay or Model, No. G-995	96	4% Half long
Western Auto Associate Store, Walpole				
442 F	Beet	Detroit Dark Red, No. 2914	86	4% Oblong - 10% flat
443 F	Carrot	Danvers Half Long, No. 3123	—	This variety is long Nantes
444 F	Radish	Scarlet Globe, No. 2868	96	4% Long tapering
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Boston				
183 F	Beet	Detroit Dark Red, No. 4037	96	2% Flat - 2% spindle shape
187 F	Spinach	Bloomdale Savoy Leaved, No. 4290	96	4% Thick leaved
Sears, Roebuck & Co., Gardner				
1047 F	Beans	Giant Stringless Green Pod	92	8% Flat pod-leaf
The Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission)				
Lincoln Junior High School, Malden				
501 F	Carrot	Chantenay or Model	98	2% Long cylindrical
497 F	Radish	French Breakfast	98	2% Long tapering
F. H. Woodruff & Sons, Milford, Conn.				
Farm Service Co., Middleboro				
177 F	Beet	Detroit Dark Red No. 22458	90	6% Long top - 4% spindle
179 F	Radish	Early Scarlet Globe, No. 1-4169 C	94	6% Long tapering
Granite City Hardware Co., Quincy				
674 F	Beet	Detroit Dark Red, 1-5116	96	2% Oblong - 2% spindle
Middlesex Co. Farm Bureau Assoc., Waltham				
342 F	Beet	Crosby's Egyptian, No. 1-557	94	2% Obovate - 4% Spindle
347 F	Beet	Detroit Dark Red, No. 20405 A	94	2% Flat - 4% oblong
Sanborn & Damon Co., Quincy				
678 F	Beet	Woodruff's Early Wonder, No. 22460	94	2% Spindle - 2% top shape 2% oblong
680 F	Beet	Crosby's Egyptian, No. 1-570	88	10% Top shape - 2% spindle
Sanford Hardware Co., Fall River				
380 F	Carrot	Chantenay, No. 1-447	—	This is not Chantenay, looks like bunching
378 F	Spinach	Nobel Giant Leaved, No. 20363 C	93	2% Savoyed
Frank Santos Co., New Bedford				
402 F	Beet	Detroit Dark Red, No. 19814	94	2% Long top - 2% spindle
James D. Splann Estate, So. Deerfield				
564 F	Carrot	Hutchinson, No. 1-5143	96	4% Light yellow roots
Arthur E. Wills, Hardware, Medfield				
428 F	Beet	Woodruff's Early Wonder, No. 23855	98	2% Long top
S. D. Woodruff & Sons, Orange, Conn.				
Allen Hardware Co., Needham				
577 F	Carrot	Danvers Half Long, No. 2611	98	2% Light lemon yellow roots
Monroe Seed Market, Attleboro				
306 F	Carrot	Chantenay, No. 2741	90	10% Half long
310 F	Radish	Scarlet Globe, No. 2311	96	4% Oblong
Daniel M. Murphy, Hardware, Cambridge				
358 F	Beet	Crosby's Egyptian, No. 2886	—	Very variable and poor strain
Sabourin Hardware Co., Fitchburg				
1005 F	Radish	Sparkler White Tip, No. 3026	90	10% Long tapering
Woburn Hardware & Plumbing Supply Co., Woburn				
605 F	Carrot	Long Orange, No. 2677	98	2% Light colored
Wholesaler Unknown				
Danvers Hardware Co., Danvers				
893 F	Radish	Scarlet Globe	94	4% Oblong - 2% long tapering

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor

and

E. B. Risley, Student Assistant

For the ninth season the Department of Floriculture has cooperated with the Seed Laboratory in conducting trials to determine the quality of flower seeds offered for sale in retail seed stores, hardware stores, chain stores, schools, and other retail outlets. The seeds, collected by the State Seed Inspector, were tested for germination and performance under field conditions.

All seeds were sown on June 16, which is a late date for many kinds of annuals, in particular Larkspur which germinates best in cool temperatures. Although the soil was somewhat dry at the time of sowing, 1.8 inches of rain fell between June 19 and 23 which should have been sufficient to bring about satisfactory germination of many of the seeds. Therefore, dry soil cannot be entirely responsible for the unsatisfactory germination obtained with many lots.

Total rainfall for the months of June, July, August and September was 18.22 inches. The normal rainfall for this period is 16.17 inches. The first frost occurred on September 21 but it was so slight that it affected only the most tender annuals. The first killing frost occurred on October 4. Thus, with the seeds sown on June 16, the growing season was 110 days.*

Seeds of 261 lots, representing 63 genera, packeted by 31 concerns, and obtained from 65 retailers, were distributed as follows:

Ageratum.....	6	Eschscholtzia.....	6	Nigella.....	1
Alyssum.....	10	Euphorbia.....	1	Papaver.....	4
Anagallis.....	1	Gaillardia.....	4	Petunia.....	11
Anchusa.....	1	Geum.....	1	Phacelia.....	1
Antirrhinum.....	1	Gilia.....	2	Phlox.....	2
Arctotis.....	1	Godetia.....	2	Portulaca.....	3
Aster.....	1	Gomphena.....	1	Reseda.....	7
Brachycome.....	1	Gypsophila.....	7	Rudbeckia.....	1
Calendula.....	10	Helichrysum.....	5	Salpiglossis.....	3
Callistephus.....	13	Iberis.....	7	Salvia.....	4
Celosia.....	5	Impatiens.....	6	Scabiosa.....	8
Centaurea.....	8	Ipomoea.....	4	Schizanthus.....	1
Chrysanthemum.....	2	Kochia.....	2	Tagetes.....	17
Clarkia.....	2	Linaria.....	2	Thunbergia.....	1
Cleome.....	1	Linum.....	1	Tithonia.....	1
Coreopsis.....	5	Lobelia.....	2	Tropaeolum.....	9
Cosmidium.....	1	Lupinus.....	2	Verbena.....	7
Cosmos.....	7	Malcomia.....	1	Xanthisma.....	1
Cynoglossum.....	1	Mathiola.....	4	Zinnia.....	16
Delphinium.....	12	Mirabilis.....	3		
Dianthus.....	7	Nemophila.....	1	Total.....	261
Didiscus.....	1	Nicotiana.....	2		

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair," between one-third and two-thirds; "poor" for

*Data on weather are taken from the Meteorological Observations of the Massachusetts Agricultural Experiment Station.

less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, with only one-third or less of the plants not true to form or color; "fair," between one-third and two-thirds not true; and "not satisfactory" if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. However, since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

Results of the test on germination are summarized as follows:

	NUMBER OF LOTS	PERCENT OF TOTAL
Good.....	87	33.34
Fair.....	50	19.15
Poor.....	106	40.61
None.....	18	6.90
Total.....	261	100.00

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Joseph Breck & Sons, Boston, Mass.				
624F	Ageratum	Blueball Improved.....	Poor	Not satisfactory
640F	Alyssum	Violet Queen.....	Poor	Not satisfactory
627F	Calendula	Breck's Giant Orange.....	Poor	Not satisfactory
626F	Calendula	Lemon Queen Improved.....	Poor	Not satisfactory
625F	Centaurea	Breck's Double Pinkie.....	Poor	Not satisfactory
629F	Cosmos	Sensation Mixed.....	Good	Satisfactory, 4 colors
634F	Dianthus	Geisha Girl.....	Fair	Satisfactory, 7 colors
628F	Iberis	Breck's White Giant.....	Good	Satisfactory
633F	Petunia	Glamour.....	Poor	Not satisfactory
635F	Rudbeckia	My Joy.....	Poor	Not satisfactory
636F	Scabiosa	Dwarf Heavenly Blue.....	Poor	Not satisfactory
631F	Tagetes	Double French Scarlet Glow.....	Fair	Incomplete; had not flowered Sept. 29
630F	Tagetes	Tall Double African Sunset Giants.....	Good	Incomplete; only 1 plant in bloom Sept. 29
632F	Tropaeolum	Semi-double Golden Gleam.....	Good	Satisfactory
639F	Zinnia	California Giant Brightness.....	Good	Satisfactory
638F	Zinnia	California Giant Golden Queen.....	Fair	Satisfactory
637F	Zinnia	California Giant Scarlet Queen.....	Good	Satisfactory
Adams Hardware Co., Dorchester				
873F	Ageratum	Blue Perfection.....	None	
Cohasset Hardware Co., Cohasset				
1179F	Portulaca	Single Mixed.....	Fair	Satisfactory, 5 colors
1180F	Salvia	Splendens.....	Poor	Not satisfactory
Hamilton Hardware Co., Hamilton				
894F	Gypsophila	Breck's Giant White.....	Good	Satisfactory
895F	Impatiens	Camellia-flowered, Breck's Special Mixture.....	Good	Satisfactory
The Welch Company, Inc., Scituate				
1187F	Reseda	Old-Fashioned Sweet Scented.....	Good	Satisfactory
W. Atlee Burpee Co., Philadelphia, Pa.				
Clinton Hardware & Auto Supply Co., Clinton				
971F	Calendula	Double Mixed.....	Poor	Not satisfactory
970F	Cosmos	Sensation Mixed.....	Poor	Not satisfactory
Firestone Stores, Hyde Park				
879F	Gaillardia	Annual Double Mixed.....	Good	Satisfactory
880F	Zinnia	David Burpee Chrysanthemum-flowered Giants.....	Good	Satisfactory, 6 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Crosman Seed Corp., E. Rochester, N. Y.				
McLellan Stores, Dedham				
790F	Arctotis	Grandis, Mixed	Poor	Not satisfactory
785F	Cynoglossum	Dwarf Firmament	Fair	Satisfactory
788F	Gypsophila	Annual White	Good	Satisfactory
789F	Reseda	Large Flowering Sweet	Good	Satisfactory
786F	Scabiosa	Tall Double Mixed	Poor	Not satisfactory
787F	Tagetes	Royal Scot. All Double	Poor	Not satisfactory
Neisner's, Inc., Holyoke				
1062F	Brachycome	Swan River Daisy, Mixed	Poor	Not satisfactory
1060F	Centaurea	Double Bachelor's Button, Pink	Good	Satisfactory
1067F-2	Delphinium	Larkspur Dark Blue Spire	Poor	Not satisfactory
1067F-3	Delphinium	Larkspur Empress Pink	None	
1067F-1	Delphinium	Larkspur Lilac Spire	Poor	Not satisfactory
1061F	Eschscholtzia	California Poppy, Mixed Colors	Good	Satisfactory, 2 colors
1063F	Euphorbia	Snow-on-the-Mountain	Fair	Satisfactory
1065F	Gaillardia	Double Blanket Flower Mixed Colors	Poor	Not satisfactory
1064F	Lupinus	Lupine. Annual Sorts Mixed	Good	Not satisfactory. White only
1066F	Tagetes	Marigold Sunset Giant	Good	Satisfactory
1059F	Zinnia	Dwarf Pompon or Lilliput, Mixed Colors	Good	Satisfactory, 9 colors
1068F	Zinnia	Mexican	Fair	Satisfactory, 12 colors
Deerington Zinnia Gardens, Bargarville, Ind.				
J. J. Newbury & Co., Holyoke				
075F	Zinnia	New Royal Golden Orange Dahlia-flowered	Poor	Not satisfactory, 4 colors
Empire Seed Co., Fredonia, N. Y.				
John B. Carbone & Co., Gardner				
1024F	Celosia	Cristata. Mixed Colors	Poor	Not satisfactory
1025F	Helichrysum	Strawflower. Mixed Colors	None	
1023F	Reseda	Sweet Odorata. Grandiflora	Good	Satisfactory
1022F	Tropaeolum	Double Golden Globe	None	
Ferry-Morse Seed Co., Detroit, Mich.				
Dine's Hardware Co., Hyde Park				
878F	Salvia	Bonfire	Poor	Incomplete; had not flowered Sept. 29
W. T. Grant Co., Boston				
853F	Antirrhinum	Giant Bedding, Rust Resistant	Poor	Incomplete; had not flowered Sept. 29
852F	Mathiola	Stock Early Beauty of Nice. Carmine Rose	Fair	Incomplete; had not flowered Sept. 29
851F	Papaver	Double Shirley Sweet Briar	Poor	Not satisfactory
Frank Harkins Hardware, East Milton				
704F	Callistephus	Aster, Wilt Resistant. Giant Crego Mixed	Poor	Not satisfactory
Hyde Park Supply Co., Hyde Park				
875F	Salpiglossis	Large Flowered, Mixed	Fair	Satisfactory, 5 colors
South Shore Hardware Co., Quincy				
673F	Ipomoea	Morning Glory, Heavenly Blue	Poor	Not satisfactory
The Welch Company, Inc., Scituate				
1190F	Tagetes	African Double Tall, Guinea Gold	Good	Satisfactory
Ben Franklin Stores, Chicago, Ill.				
Goddard's 5c to \$1.00 Store, Scituate				
1193F	Calendula	Double Mixed	Poor	Not satisfactory
1194F	Cosmos	Orange Flare	Poor	Not satisfactory
1196F	Delphinium	Larkspur. Tall Double Mixed	Poor	Not satisfactory
1195F	Gaillardia	Annual Double Mixed	Poor	Not satisfactory
1197F	Verbena	Giant Mixed	Poor	Not satisfactory
1198F	Zinnia	Dahlia-flowered Mixed	Poor	Not satisfactory
Fraser's Wellesley, Mass.				
Cohasset Hardware Co., Cohasset				
1181F	Cosmos	True Early-Mixed Mammoth-Single-Immunized	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Fraser's, Continued				
Plymouth Rock Hardware Co., Plymouth				
828F	Callistephus	Aster, All Varieties Mixed. Wilt Resistant.....	Poor	Not satisfactory
829F	Gypsophila	London Market. Annual White.....	Good	Satisfactory
830F	Portulaca	Large Flowered.....	Fair	Satisfactory, 8 colors
Fredonia Seed Co., Fredonia, N. Y.				
B. D. Rackliffe Hardware Co., Spfld.				
1238F	Alyssum	Bentham's Sweet.....	Poor	Not satisfactory
1239F	Callistephus	Aster, Tall Branching Mixed.....	Fair	Incomplete; had not flowered Sept. 29
1236F	Eschscholtzia	California Poppy. Finest Mixed.....	Good	Satisfactory, 2 colors
1237F	Gypsophila	Baby's Breath. Large Flowers.....	Good	Satisfactory
1240F	Helichrysum	Strawflower, Mixed.....	Fair	Satisfactory
1235F	Mathiola	Stock, Finest Mixed Double.....	Good	Incomplete; had not flowered Sept. 29
1234F	Verbena	Finest Mixed.....	Poor	Not satisfactory
1233F	Zinnia	Giants Finest Mixed.....	Poor	Not satisfactory
G. E. Warren Hardware Co., Braintree				
781F	Impatiens	Balsam, Finest Mixed.....	Fair	Satisfactory, 4 colors
Thomas J. Grey Co., Boston, Mass.				
623F	Callistephus	Aster, Early American Beauty. Wilt Resistant, Rose.....	Poor	Not satisfactory
612F	Callistephus	Aster, Early American Beauty. Wilt Resistant, White.....	Poor	Not satisfactory
617F	Cosmos	Early Hybrid, Yellow Flare Klondyke.....	Fair	Satisfactory
621F	Delphinium	Larkspur. Mixed Cockade.....	None	
611F	Gaillardia	Pinwheel. Wine Color.....	Poor	Not satisfactory
614F	Impatiens	Balsam, Double Bush-flowered. Pink Ball.....	Poor	Not satisfactory
622F	Linaria	Maroecana, Excelsior Mixed.....	Good	Satisfactory, 5 colors
615F	Petunia	Cheerful, Nana compacta, Clear Light Pink.....	Poor	Not satisfactory
616F	Petunia	Rosie, Dwarf Giants of California.....	Poor	Not satisfactory
620F	Salvia	Microphylla.....	None	
613F	Tagetes	Marigold, Gold Crest, Dwarf Harmony.....	Good	Satisfactory
619F	Tagetes	Marigold, Mammoth "Mum". Lemon Color.....	Fair	Incomplete; only 1 plant in bloom Sept. 29
618F	Zanthisma	Texanum, Star of Texas.....	Poor	Not satisfactory
Joseph Harris Co., Inc., Rochester, N.Y.				
Joseph Harris Co., Inc., Cambridge				
95F	Callistephus	Aster, Crego Variety Mixture. Wilt Resistant.....	Poor	Not satisfactory
94F	Celosia	Plumosa, Tall Plumed, Mixed Colors.....	Fair	Satisfactory, 4 colors
93F	Nicotiana	New Hybrids, Mixed Colors.....	Poor	Not satisfactory
Charles C. Hart Seed Co., Westfield, Conn.				
Bliss Hardware Co., Plymouth				
847F	Ageratum	Blue Perfection.....	Poor	Not satisfactory
Centre Hardware Co., Roslindale				
686F	Nicotiana	Affinis Hybrids.....	Fair	Satisfactory
Davis Hardware Co., Gardner				
1030F	Centaurea	Bachelor's Button, Double Blue Florist's Strain.....	Good	Satisfactory
1029F	Tropaeolum	Nasturtium, Dwarf Semi-Double Golden Gleam.....	Good	Satisfactory
Mansfield Lumber Co., Mansfield				
914F	Iberis	Candytuft, Dwarf Hybrids, Finest Mixed Colors.....	Fair	Satisfactory, 4 colors
Plymouth Rock Hardware Co., Plymouth				
831F	Eschscholtzia	California Poppy mixed.....	Good	Satisfactory, 3 colors
B. D. Rackliffe, Hardware, Springfield				
1241F	Delphinium	Larkspur, Finest Mixed.....	Poor	Not satisfactory; 1 plant
1243F	Mathiola	Stock, Finest Mixed Dwarf.....	Good	Incomplete; had not flowered Sept. 29
1242F	Scabiosa	Mourning Bride Mixed.....	Poor	Not satisfactory
Fred F. Smith, Inc., Reading				
804F	Tropaeolum	Nasturtium, Dwarf Mixed.....	None	

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Budd D. Hawkins, Reading, VI.				
1130F	Tagetes	Franklin Hardware Co., Springfield Marigold, New Crown of Gold.	None	
1130-AF	Tagetes	Marigold Choice, Double Mixed Colors	None	
760F	Tropaeolum	N. F. Spencer, So. Deerfield Nasturtium, Dwarf Mixed Colors.	Fair	Incomplete; only 1 plant had flowered Sept. 29
Hygrade Seed Co., Inc., Fredonia, N.Y.				
Union Street School, Middelboro				
165F	Dianthus	Sweet Wivelsfield.	Good	Satisfactory, 5 colors
169F	Papaver	Poppy American Legion.	Fair	Satisfactory
170F	Petunia	Exquisite Hybrida Mixed.	Fair	Satisfactory, 6 colors
172F	Salpiglossis	Exquisite Mixed Colors.	Poor	Not satisfactory
167F	Tagetes	Marigold, Orbit.	Fair	Satisfactory
166F	Tagetes	Marigold Sunset Giants and California Giants Mixed.	Good	Satisfactory
168F	Tropaeolum	Nasturtium New Scarlet Gleam Double	Good	Satisfactory
171F	Zinnia	California Giants Mixed Colors.	Good	Satisfactory
John E. Jordan Co., Plymouth, Mass.				
850F	Ipomoea	Morning Glory, Heavenly Blue.	Good	Satisfactory
D. Landreth Seed Co., Bristol, Pa.				
C. & D. Hardware & Plumbing Supply Co., Rockland				
1199F	Helichrysum	Strawflower, Mixed.	Good	Satisfactory
1201F	Papaver	Poppy American Legion.	Fair	Satisfactory
1202F	Reseda	Mignonette Large Flowering Mixed.	Good	Satisfactory
1200F	Scabiosa	Bloomsdale Mixed.	Poor	Not satisfactory
Aitch C. Freeman, Whitman				
649F	Calendula	Orange King.	Poor	Not satisfactory
650F	Tagetes	Marigold Guinea Gold All Double.	Good	Satisfactory
Leavitt's Sport Shop, Haverhill				
1164F	Alyssum	Lilac Queen Improved.	Good	Satisfactory
1165F	Dianthus	I aciniatus Splendens.	Poor	Not satisfactory
1163F	Iberis	Candytuft Hyacinth-flowered White.	Good	Satisfactory
Salem Hardware Co., Salem				
864F	Tropaeolum	Nasturtium, Dwarf Mixed.	Good	Satisfactory
Frank L. Whitcomb, Amherst				
1081F	Alyssum	Benthami Procumbens.	Poor	Not satisfactory
1085F	Callistephus	Aster, Early Queen of Market Mixed	Poor	Not satisfactory
1083F	Eschscholtzia	California Poppy, Mixed.	Good	Not satisfactory, 2 colors
1084F	Iberis	Candytuft, Umbellata Mixed.	Poor	Not satisfactory
1082F	Impatiens	Balsam, Rose-flowered, Double Mixed	Good	Satisfactory, 4 colors
Michael-Leonard Seed Co., Chicago, Ill.				
W. E. Aubuchon Co., Inc., Clinton				
983F	Tropaeolum	Nasturtium Dwarf Mixed.	Good	Satisfactory
Mandeville & King Co., Rochester, N. Y.				
Adams Hardware Co., Dorchester				
874F	Cleome	Spider Plant Pink Queen.	Good	Not satisfactory. Not true to name
Bryant Hardware Co., Bradford				
1159F	Linaria	Fairy Bouquet, All Colors.	Good	Satisfactory, 6 colors
1160F	Lobelia	Crystal Place, Dwarf.	Poor	Not satisfactory; 1 plant
1158F	Mirabilis	Four O'Clocks, All Colors.	Good	Satisfactory
1161F	Nemophila	Love Grove, Blue and White.	Good	Satisfactory
Cohasset Hardware Co., Cohasset				
1186F	█ Anagallis	Pimpernel, Scarlet and Other Colors.	Good	Satisfactory
1182F	█ Delphinium	Larkspur, All Colors.	None	
1187F	█ Dianthus	Pinks, All Colors.	Poor	Not satisfactory
1183F	█ Gilia	Capitata Queen Anne's Thimble.	Fair	Satisfactory
1184F	█ Tithonia	Mexican Sunflower, Orange Scarlet.	Good	Satisfactory
Hutchinson Hardware Co., Lynn				
860F	█ Malcomia	Virginian Stock, All Colors.	Good	Satisfactory
859F	█ Papaver	Poppy Flanders Field, Single Shirley.	Fair	Satisfactory; some double present
858F	Phacelia	Bluebells of California.	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Mandeville & King Co., Continued				
710F	Aster	H. H. Newell Co., Shelburne Falls Tahoka Daisy, Lilac-blue.....	Poor	Not satisfactory
709F	Zinnia	Valencia, Burnt Orange.....	Fair	Not satisfactory, 5 colors
832F	Anchusa	Plymouth Rock Hardware Co., Plymouth Blue Bird.....	Poor	Not satisfactory
1244F	Phlox	B. D. Rackliffe, Hardware, Springfield Art Shades, All Colors.....	Poor	Not satisfactory
780F	Tagetes	G. E. Warren, Hardware, Braintree Marigold Royal Scot, Mahogany & Gold Striped Dwarf.....	Poor	Not satisfactory
887F	Portulaca	West Roxbury Hardware Co., West Roxbury Double and Single, All Colors.....	Poor	Not Satisfactory
886F	Thunbergia	Black-eyed Susan Vine, All Shades..	Fair	Satisfactory
904F	Celosia	Whitcomb Carter Co., Beverly Feathered, All Colors.....	Good	Satisfactory, 3 colors
905F	Helichrysum	Strawflower, All Colors.....	Fair	Satisfactory, 5 colors
820F	Geum	Whitmore Hardware Co., Melrose Mrs. Bradshaw, Scarlet.....	None	
Northrup, King & Co., Minneapolis, Minn.				
739F	Ageratum	J. J. Croteau & Co., Northampton Dwarf Blue Perfection.....	None	
882F	Clarkia	Economy 5c to \$1.00 Store, West Rox- bury Double Mixed.....	Poor	Not satisfactory
884F	Cosmos	Early Large Flowering Mixed.....	Good	Satisfactory, 4 colors
883F	Kochia	Mexican Firebush or Summer Cypress	Good	Satisfactory
705F	Scabiosa	Frank Harkins Hardware Co., E. Milton Mourning Bride, Mixed Colors.....	Poor	Not satisfactory
F. W. Woolworth & Co., Holyoke				
1072F	Delphinium	Larkspur, Los Angeles Improved Rosepink.....	Poor	Not Satisfactory; 1 plant
1070F	Didiscus	Coeruleus, Blue Lace Flower.....	Fair	Satisfactory
1069F	Eschscholtzia	Aurantiaca, California Poppy, Golden Orange.....	Good	Satisfactory
1073F	Gomphrena	Globe Amaranth, Mixed.....	Good	Satisfactory
1071F	Gypsophila	Annual Crimson Baby's Breath.....	Fair	Satisfactory
F. W. Woolworth & Co., Northampton				
750F	Callistephus	Aster, Crego or Ostrich Plume Purple	Poor	Not satisfactory
754F	Dianthus	Pinks, Double Mixed.....	Fair	Satisfactory, 7 colors
751F	Godetia	Satin Flower, Tall Mixed.....	Poor	Not satisfactory
753F	Impatiens	Balsam, Tall Double Camellia- flowered Mixed.....	Good	Satisfactory, 5 colors
756F	Linum	Grandiflorum Rubrum, Scarlet Flax..	Good	Satisfactory
752F	Mirabilis	Four O'Clocks, Fine Mixed Colors...	Good	Satisfactory, 3 colors
755F	Petunia	Hybrida General Dodds, Red.....	Poor	Not satisfactory
757F	Verbena	Mammoth Flowering Scarlet Spectrum Red.....	Poor	Not satisfactory
The Page Seed Co., Greene, N. Y.				
923F	Callistephus	Ben's 5c and \$1.00 Store, Brockton Aster, Pink Comet, Wilt Resistant...	Fair	Satisfactory
925F	Celosia	Cockscomb, Plumosa and Cristata Mixed.....	Poor	Not satisfactory
924F	Clarkia	All colors Mixed.....	Poor	Not satisfactory
926F	Dianthus	Pinks, Single Mixed.....	Poor	Not satisfactory
L. M. Johnson, Reading				
801F	Chrysanthemum	Coronarum, Double Mixed Colors...	Fair	Satisfactory
802F	Petunia	Rosy Morn.....	Fair	Satisfactory
Robert A. Wait Hardware, No. Adams				
916F	Alyssum	Sweet, White.....	Poor	Not satisfactory
917F	Coreopsis	Calliopsis, Mixed Colors.....	Fair	Satisfactory, 4 colors
918F	Gypsophila	Baby's Breath, Annual.....	Good	Satisfactory
919F	Lobelia	Bedding Queen.....	Poor	Not satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Perry Seed Co., Boston, Mass.				
646F	Alyssum	Carpet of Snow.....	Good	Satisfactory
641F	Calendula	Perry's Double Mixed.....	Fair	Satisfactory, 5 colors
642F	Cosmos	Sensation Dazzler, Deep Velvety Crimson.....	Good	Satisfactory
644F	Delphinium	Larkspur, Giant Imperial.....	Poor	Not satisfactory
645F	Petunia	Igloo.....	Poor	Not satisfactory
643F	Tagetes	Marigold Spry, Dwarf Double French	Good	Satisfactory
Ralston Purina Co., St. Louis, Mo.				
Checkerboard Feed Store, Milford				
490F	Petunia	Rosy Morn.....	Good	Satisfactory
489F	Tagetes	Crown of Gold.....	Poor	Not satisfactory
Jerome B. Rice Seed Co., Cambridge, N. Y.				
H. J. Croteau & Co., Northampton				
737F	Chrysanthemum	Single Mixed.....	Poor	Not satisfactory
736F	Verbena	Gloradale Beauty.....	Fair	Not satisfactory, 4 colors
738F	Zinnia	Zinnigold, Mexican Zinnia, Mixed Colors.....	Fair	Satisfactory, 12 colors
Danvers Hardware Co., Danvers				
891F	Ageratum	Blue Perfection.....	Poor	Not satisfactory
892F	Gypsophila	Covent Garden Market.....	Good	Satisfactory
Kingston Hardware Co., Kingston				
825F	Centaurea	Dusty Miller.....	Fair	Satisfactory
824F	Mirabilis	Four O'Clock, Mixed.....	Good	Satisfactory, 6 colors
Middlesex Supply Co., Lowell				
698F	Salvia	Bonfire.....	None	
Plymouth Supply Co., Plymouth				
835F	Zinnia	Dahlia-Flowered, Mixed.....	Good	Satisfactory, 6 colors
Western Auto Associate Store, Mansfield				
910F	Coreopsis	Calliopsis, Tall Mixed.....	Poor	Not satisfactory
Whitmore Hardware Co., Melrose				
818F	Gilia	Capitata, Mixed.....	Good	Satisfactory
819F	Godetia	Double Mixed.....	Poor	Not satisfactory
J. B. Rice, Jr., Inc., Sushan, N. Y.				
Bengston Hardware Co., Gardner				
1035F	Calendula	Double Mixed.....	Poor	Not satisfactory
1036F	Centaurea	Bachelor's Button, Double Blue.....	Good	Satisfactory
C. F. Jordan Hardware Co., Bridgewater				
653F	Callistephus	Aster, Annual Branching Mixed.....	None	
654F	Petunia	Rosy Morn.....	Poor	Not satisfactory
Fred F. Smith, Inc., Reading				
808F	Callistephus	Aster, Giant Crego Mixed.....	Poor	Not satisfactory
Thompson Hardware Co., Lowell				
953F	Iberis	Candytuft, Finest Mixed.....	Fair	Satisfactory, 5 colors
952F	Reseda	Mignonette, Machet.....	Good	Satisfactory
954F	Scabiosa	Mourning Bride, Mixed.....	Poor	Not satisfactory
955F	Schizanthus	Annual Butterfly Flower Mixed.....	Good	Satisfactory, 4 colors
Ross Bros., Worcester, Mass.				
Bengston Hardware Co., Gardner				
1037F	Centaurea	Bachelor's Button, Single and Double Mixed.....	Good	Satisfactory, 5 colors
1034F	Celosia	Cockscomb Choice Mixed.....	Fair	Satisfactory, 6 colors
Concord Hardware & Plumbing Supply Co., Concord				
990F	Tropaeolum	Nasturtium, Double Golden Gleam..	Fair	Incomplete; had not flowered Sept. 29
989F	Scabiosa	Mourning Bride, Mixed Colors.....	None	

Flower Seed Inspection—Continued

Ross Bros. Co., Continued			
Franklin Hardware Co., Springfield			
1226F	Alyssum	Sweet	Fair Satisfactory
1228F	Calendula	Choice Mixed	Poor Not satisfactory
1227F	Coreopsis	Calliopsis, Choice Mixed	Poor Not satisfactory
1223F	Dianthus	Pinks, Choice Mixed	Fair Satisfactory, 10 colors
1229F	Nigella	Blue and White Mixed	Poor Not satisfactory
1224F	Phlox	Drummondii, Choice Mixed	None
1222F	Tagetes	African Double Mixed	Fair Satisfactory, 3 colors
1225F	Verbena	Choice Mixed	Poor Not satisfactory
Sears, Roebuck & Co., Chicago, Ill.			
Sears, Roebuck & Co., Gardner			
1051F	Alyssum	Sweet, White	Fair Satisfactory
1048F	Helichrysum	Strawflowers, Mixed	Poor Not satisfactory
1050F	Impatiens	Balsam, Double Mixed	Good Satisfactory, 3 colors
1049F	Mathiola	Stock, Large Flowered Mixed	Poor Not satisfactory
1052F	Verbena	Large Flowered Mixture	Fair Satisfactory, 6 colors
Sears, Roebuck & Co., Northampton			
743F	Callistephus	Aster, Giant Ostrich Plume Mixed	Poor Not satisfactory
744F	Centaurea	Bachelor's Button, Double Blue	Good Satisfactory
746F	Delphinium	Larkspur, Tall Double Blue	None
742F	Eschscholtzia	Aurantiaca, California Poppy, Orange	Good Satisfactory
745F	Kochia	Mexican Fire Bush	Fair Satisfactory
747F	Ipomoea	Moonflower, White	Good Incomplete; had not flowered Sept. 29
748F	Ipomoea	Morning Glory, Heavenly Blue	Good Satisfactory
749F	Zinnia	Giant Dahlia-flowered, Mixed	Good Satisfactory, 6 colors
Sterling Seed Co., Minneapolis, Minn.			
McClellan Stores, Plymouth			
840F	Alyssum	Sweet	Fair Satisfactory
838F	Coreopsis	Calliopsis, Fine Mixed	Good Satisfactory, 3 colors
836F	Cosmidium		Poor Not satisfactory
837F	Delphinium	Larkspur, Lustrous Carmine	Poor Not satisfactory
839F	Iberis	Candytuft, Umbellata, Mixed Colors	Poor Not satisfactory
J. J. Newberry Co., Holyoke			
1078F	Coreopsis	Calliopsis, Fine Mixed	Good Satisfactory, 4 colors
1077F	Lupinus	Subcarneus, Blue Bonnet	Poor Not satisfactory
1076F	Reseda	Mignonette, Sweet Scented	Good Satisfactory
1074F	Salpiglossia	Painted Tongue, Large Flowered Mixed	Poor Not satisfactory
Templin-Bradley Co., Cleveland, Ohio			
(Children's Flower Mission)			
Lincoln Junior High School, Malden			
520F	Alyssum	Sweet, Pure White	Good Satisfactory
516F	Calendula	Scotch Marigold	Poor Not satisfactory
517F	Iberis	All Colors, Mixed	Poor Not satisfactory
519F	Petunia	Hybrids Mixed	Fair Satisfactory, 5 colors
518F	Reseda	Mixed Varieties	Good Satisfactory
521F	Zinnia	Little Red Riding Hood	Good Satisfactory
Vaughan's Seed Store, New York, N. Y.			
Arnold-Fisher Co., Boston			
1203F	Ageratum	Blue Perfection	Poor Not satisfactory
1205F	Calendula	Shaggy, Orange	Poor Not satisfactory
1204F	Callistephus	Aster, Giant Branching, Wilt Resistant Mixed	None
1206F	Centaurea	Cyanus, Blue Boy	Good Satisfactory
1210F	Delphinium	Larkspur Vaughan's Special Annual Mixture	Poor Not satisfactory
1208F	Petunia	Single Dwarf Flowering Rose of Heaven	Poor Not satisfactory
1209F	Scabiosa	Vaughan's Special Mixture	Poor Not satisfactory
1207F	Tagetes	Marigold Giant Mixture	Poor Not satisfactory
1211F	Verbena	Mammoth Mixed	Poor Not satisfactory
1212F	Zinnia	Fantasy Mixture	Poor Not satisfactory

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 124

JULY, 1945

**Twenty-fifth Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

The value of pullorum-free stock has been recognized for many years by the Massachusetts poultry industry. During the 1944-45 season, a record number of flocks (529) and samples (975,041) have been tested in this State. The percentage of reactors detected among chickens was 0.12. A most encouraging fact is that 93 percent of all birds tested are in 100 percent tested non-reacting flocks. The majority of flock owners recognize the importance of sound eradication and prevention measures in a successful disease eradication program.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

TWENTY-FIFTH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1944-1945

By the Poultry Disease Control Laboratory¹

INTRODUCTION

During the 1944-45 season, there was a considerable increase in volume of testing, due, no doubt, to a definite increase in the chicken and turkey population in Massachusetts. It is gratifying that, as the chicken population increases and the testing work grows, the pullorum status of flocks also improves.

However, one should not fail to recognize that there are still reservoirs of infection within the boundaries of Massachusetts and that no definite restrictions are in force to prohibit the sale and distribution of infected stock originating either within or without the State. It is hoped that persons raising chickens and turkeys will become increasingly more interested in pullorum-free stock.

During the past season the laboratory has been confronted with many difficulties in carrying on the work. Shortage of labor, transportation difficulties, and scarcity of equipment have increased the burden on the testing personnel, especially the permanent staff. The flock owner, likewise, has had his troubles in arranging for time and help to get his flock tested. Most flocks were tested without delay. The laboratory is appreciative of the fine cooperative spirit displayed by the flock owners and other persons associated with the testing program. As this bulletin is being prepared, it appears that during the coming season the demand for testing may be even greater than in 1944-45. In such an event, the laboratory will carry on as effectively as possible, and it is hoped that the flock owners will recognize the difficulties involved and continue to cooperate to the fullest extent.

Summary of Service Rendered

Applications received.....	543
Applications cancelled.....	14
Flocks tested.....	529
Chicken flocks.....	447
Chicken and turkey flocks..	11
Turkey flocks.....	71
Number of tests.....	975,041
Chickens:	
Routine.....	908,478
Experimental.....	36,323*
Fowl other than chickens:	
Routine.....	28,949
Experimental.....	1,291
Owners receiving necropsy service.....	71**
Necropsies of reacting birds.....	182***
* Includes 814 fowl typhoid tests.	
** Includes 2 turkey flocks.	
*** Includes 3 turkeys.	

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Chief of Laboratory; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; Miriam K. Clarke, Research Assistant; Felicia Jewett, Laboratory Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

Table 1. Distribution of Tests and Reactors by Counties and by Breeds

Breeds	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Percent Positive Tests
(Total tests	4,377	3,876	97,927	284	72,994	25,392	20,037	26,197	111,991	51,455	55,915	137,038	607,483	
(Positive tests	4	0	22	0	48	7	47	30	184	63	366	11	782	0.13
Rhode Island Reds.....														
(Total tests	988	1,014	24,737	1,922	10,980	13,707	2,743	3,976	35,989	12,867	32,869	34,338	176,130	
(Positive tests	0	0	2	0	2	13	2	2	24	9	157	3	214	0.12
Barred Plymouth Rocks.....														
(Total test			197		2,278		683	1,704	7,382	1,130	10,477	533	24,384	
(Positive tests			0		0		0	0	2	0	0	0	2	0.008
White Plymouth Rocks.....														
(Total tests		3,813	229		6,450		147						10,639	
(Positive tests		0	0		0		0						0	0.00
White Leghorns.....														
(Total tests			8,757		25,721	3,346	1,106	1,251	28,240	2,135	38,322	7,813	116,691	
(Positive tests			2		7	0	1	10	14	0	34	0	68	0.06
New Hampshire.....														
(Total tests	223	325	800		784			702	649	1,973	1,787	1,417	8,660	
(Positive tests	0	0	1		6			0	3	0	37	0	47	0.54
Miscellaneous.....														
Total Tests.....	5,588	9,028	132,647	2,206	119,207	42,445	24,716	33,830	184,251	69,560	139,370	181,139	943,987	
Positive Tests.....(Number	4	0	27	0	63	20	50	42	227	72	594	14	1,113	
(Percent	0.07	0.00	0.02	0.00	0.05	0.05	0.20	0.12	0.12	0.10	0.43	0.008	0.12	

DISTRIBUTION OF TESTS AND REACTORS

In Table 1 the number of tests and reactors are listed by counties. From the 12 counties a total of 943,987 samples was tested which revealed 0.12 percent reactors. No reactors were found in Berkshire and Dukes counties. In the remaining 10 counties, the percentages of infection ranged from .008 to 0.43. Middlesex, Worcester, Plymouth, Bristol, and Essex counties lead in the number of tests. In all of these five counties the number of tests exceeded one hundred thousand.

The following breeds and varieties were tested: Bantam, Barred Plymouth Rock, Brahma, Crosses, Dark Cornish, Jersey White Giant, New Hampshire, Rhode Island Red, White American, White Leghorn, White Plymouth Rock, and White Wyandotte. The bulk of the increase in samples over the previous season occurred among three breeds, Rhode Island Red, Barred Plymouth Rock, and New Hampshire. Reactors were detected among the Rhode Island Red, Barred Plymouth Rock, White Plymouth Rock, New Hampshire, Brahma, White Wyandotte, Bantam, Jersey White Giant, and Dark Cornish.

A total of 858,686 samples was collected from females (hens 62,499 and pullets 796,187). The incidence of reactors was lower among the hens (0.07 percent) than among the pullets (0.12 percent). Among 85,301 samples tested from males, 0.11 percent were detected as reactors. It is of interest to note that the incidence of reactors among males was about the same as among the pullets.

ANNUAL TESTING OF FLOCKS

The results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years are given in Table 2.

There was a slight decrease over the previous season in the number of flocks and birds tested for the first time, but the number of samples tested and the percentage of reactors were slightly greater. There were 80 non-reacting flocks, representing 89,851 birds, and 8 positive flocks, representing 7,212 birds.

In the group tested intermittently, the number of flocks was the same as in the previous season, but the number of birds and samples greatly exceeded the figures for 1943-44. The percentage of infection (0.42) was also less. Twenty-three flocks, representing 41,082 birds, were identified as non-reacting; while seven flocks which represented an unusually large number of birds (21,299) were classified as positive.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially Tested	100% Tested	Partially Tested
Flocks tested —									
For the first time	88	97,063	115,811	468	0.40	75	5	5	3
Intermittently	30	62,381	67,582	287	0.42	22	1	3	4
Two consecutive years	80	107,267	116,068	177	0.15	73	3	3	1
Three or more consecutive years	260	569,770	644,526	181	0.03	243	9	5	3
Totals	458	836,481	943,987	1,113	0.12	413	18	16	11

In the group tested for two consecutive years, considerable increases in flocks, birds, and tests were observed over the previous year. A total of 80 flocks was tested, representing 116,068 tests of which 0.15 percent were positive. Of these, 76 flocks, representing 103,067 birds, were non-reacting.

Among the group of flocks tested for three or more consecutive years, the results are much the same as those of the previous season. This group is by far the largest of the four groups and has the lowest percentage of positive tests.

For the four groups as a whole 458 flocks were tested, representing 836,481 birds and 943,987 samples, of which 0.12 percent were positive. The 413 flocks which were 100 percent tested and non-reacting contained 776,089 birds or 93 percent of the total birds tested.

The number of positive flocks was the same as the previous season, 27 flocks representing 43,930 birds. The objective of the pullorum eradication program is to reduce the number of infected breeding flocks to as low a minimum as possible. Approximately 5 percent of the birds tested are in positive flocks. Owners of infected flocks are advised not to breed from such flocks until all of the infection has been eliminated from the premises either through intensive retesting or by flock replacement with pullorum-free stock.

Annual testing of all birds on the premises still remains a sound and effective practice in the control and eradication of pullorum infection. Unfortunately, each year a considerable number of flock owners discontinue testing. Approximately 15 percent of the flocks tested in 1943-44 were not tested in 1944-45.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

The appearance of pullorum infection in previously non-reacting flocks is of great concern to the testing agency, the flock owner, and the hatcheryman. Progress in the eradication of pullorum disease is greatly influenced by the success in maintaining flocks free of the disease after the infection has once been eliminated.

Table 3 gives the testing results for flocks which had been non-reacting for one or more years but showed infection in 1944-45. Twenty-one "breaks," which is four more than occurred the previous year, are listed. Seventeen of these flocks had less than 0.5 percent reactors. Three flocks revealed more than 2 percent reactors. Expressed in number of reactors, 15 flocks had six or less. These figures reveal that the amount of infection detected is very small, in fact 10 of these flocks regained their Pullorum Clean rating through one retest, 5 qualified for the Pullorum Passed grade, and 6 failed to obtain a negative test. Seven of the "break" flocks had been negative only one year. However, 12 flocks had been negative for five or more consecutive years.

As to the explanation for the "breaks," the source of infection was unknown in 13 flocks. Purchase of infected or questionable stock, and inadequate preventive measures were responsible for the other eight "breaks."

A "break" may prove very expensive to the flock owner as well as an added burden to him, to the testing laboratory, and to the official state agency. A good many "breaks" can be avoided by greater care in keeping out infection. It is recognized that under these war-time conditions, adequate facilities and labor for disease prevention may have been curtailed. However in spite of these difficult times, it is hoped that the flock owners and hatcherymen will observe and exercise the following measures:

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.

3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.

4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.

Table 3. Appearance of Infection in Flocks Previously Negative

Flock	Number of Years Negative	1944-45 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	5	8,943	8,942	0.08	Unknown
		8,464	8,463*	0.00	
2	5	1,736	1,733	2.14	Introduction of infected stock
		1,335	634*	0.00	
		1,250	1,249*	0.56	
		1,111	1,111*	0.27	
		1,014	1,014*	0.00	
3	6	1,254	1,253	0.16	Unknown
		1,176	1,176*	0.00	
4	5	1,272	1,271	0.16	Inadequate preventive measures
5	6	5,303	5,302	0.06	Unknown
		4,167	4,167*	0.00	
6	6	1,219	1,179	0.42	Unknown
		1,136	1,136*	0.00	
7	3	1,200	613	3.92	Inadequate preventive measures
8	5	1,402	1,401	0.07	Unknown
		1,281	1,281*	0.00	
9	6	2,139	2,088 ^c	0.10	Unknown
		2,007	507*	0.20	
		1,966	166*	0.00	
10	2	922	929	0.33	Unknown
		656	656*	0.00	
11	10	5,210	5,132	0.14	Unknown
		5,018	1,217*	0.00	
		4,719	4,716*	0.00	
12	8	1,754	1,753	0.06	Unknown
		1,758	457*	0.00	
		1,658	1,655*	0.00	
13	1	1,273	1,273	0.08	Questionable stock
14	1	765	765	1.44	Inadequate preventive measures
15	1	1,951	1,801	0.28	Unknown
		1,584	1,584*	0.00	
16	9	2,972	2,972	0.03	Unknown
		2,741	2,741*	0.00	
17	1	5,074	5,074	0.06	Unknown
		4,835	3,520*	0.00	
		4,515	800*	0.00	
18	1	59	59	8.47	Inadequate preventive measures
19	1	2,606	2,606	0.31	Unknown
		2,358	2,358*	0.00	
		2,140	540*	0.00	
20	6	3,935	3,134	0.26	Inadequate preventive measures
		3,900	986*	0.30	
		3,827	1,125*	0.00	
		2,870	2,518*	0.00	
21	1	5,319	5,319	0.41	Introduction of infected stock
		5,012	5,012*	0.06	
		4,636	335*	0.00	
		4,600	285*	0.00	

* Represents retests

5. The poultry houses, runs, and equipment, should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.

6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult your county agent regarding additions or replacements in your flock.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING OF FOWL OTHER THAN CHICKENS

There has been a marked increase in the number of turkeys tested during the past season. This may be explained to a large degree by the rapid expansion of the turkey industry in Massachusetts, including a tremendously increased demand for locally produced hatching eggs and poults. During the season 82 turkey flocks were tested, 11 of which were on farms with tested chickens.

The following table summarizes the results of testing fowl other than chickens:

Fowl	Number of Birds	Reactors		Number of Tests	Reactors	
		Number	Percent		Number	Percent
Turkeys	22,257	630	2.83	30,204	958	3.17
Guineas	15	0	0.00	15	0	0.00
Ducks	10	0	0.00	10	0	0.00
Geese	11	0	0.00	11	0	0.00
Totals	22,293	630		30,240	958	

The percentage of reactors among turkeys is rather high. These reactors were confined to 19 flocks, in which the amount of infection ranged from 0.94 to 46.94 percent. Eight of the 19 flocks were subjected to either a partial or a complete retest. In a few flocks a negative test was obtained on retest. The following summary shows the range in size for the turkey flocks:

Size of Flock	Number of Flocks
0-50	34
51-100	11
101-150	7
151-200	4
201-500	15
501-1000	8
1001-2000	1
2001 and more	2

Among the 26 flocks with 200 birds or more, 11 were infected. A further analysis of these data shows that the bulk of the turkey breeding stock tested in Massachusetts is located in infected flocks. This presents a situation which is not very encouraging to the Massachusetts turkey industry; and unless steps are taken to correct it, the future of the Massachusetts turkey breeder cannot be looked upon with a great deal of optimism.

Turkey breeders have not appreciated fully what is necessary for the control and eradication of pullorum infection. Greater caution should be exercised in the selection of sources of new stock. Far too many turkey raisers buy from infected flocks. Those breeders with infected flocks fail to follow a sound and complete eradication program. Too much reliance is placed on one or two tests for eliminating the infection from their flocks. Too few make a conscientious effort to adopt and follow a sound program for the establishment of a pullorum-free flock.

Owners of infected breeding flocks are advised to plan an eradication program which is suitable and workable for their own flock and which, if conscientiously carried out, should lead to the establishment of a pullorum-free flock. The eradication measures listed in the previous section apply to turkeys as well as to chickens.

NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4 the non-reacting and positive flocks are classified by counties. A total of 431 non-reacting flocks, representing 792,551 birds, was detected in 12 counties. Of this total, 413 flocks were 100 percent tested, representing 776,089 birds; and 18 were partially tested, including 16,462 birds. Middlesex, Worcester, Essex, and Bristol counties have the largest number of birds in non-reacting flocks.

Twenty-seven flocks (5.9 percent of the flocks tested) were classified as positive at the close of the season. The number of birds represented was 43,930 which is 5.2 percent of the total birds tested. Berkshire, Dukes, and Hampden counties had no positive tested flocks at the end of the season.

These results show that Massachusetts has a large supply of pullorum-free stock and that pullorum infection is still a problem in approximately 6 percent of the flocks tested. The number of infected flocks can be reduced if flock owners will recognize the possible ways infection can be eliminated. Too often owners of infected flocks delay their plans until it is impossible to correct the situation before the main hatching season commences.

Table 4. Non-reacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Non-reacting Flocks						
Barnstable	2	3,711	—	—	2	3,711
Berkshire	4	9,028	—	—	4	9,028
Bristol	54	109,393	2	474	56	109,867
Dukes	1	2,206	—	—	1	2,206
Essex	58	111,721	4	3,392	62	115,113
Franklin	21	39,039	—	—	21	39,039
Hampden	17	19,800	1	252	18	20,052
Hampshire	26	29,430	—	—	26	29,430
Middlesex	85	157,249	4	6,502	89	163,751
Norfolk	27	57,963	1	356	28	58,319
Plymouth	41	90,985	4	4,680	45	95,665
Worcester	77	145,564	2	806	79	146,370
Totals	413	776,089	18	16,462	431	792,551
Positive Flocks						
Barnstable	1	1,877	—	—	1	1,877
Bristol	1	1,271	1	578	2	1,849
Essex	—	—	4	1,196	4	1,196
Franklin	3	1,384	—	—	3	1,384
Hampshire	1	765	1	613	2	1,378
Middlesex	5	14,089	1	289	6	14,378
Norfolk	1	2,665	1	3,786	2	6,451
Plymouth	2	8,921	3	3,021	5	11,942
Worcester	2	3,475	—	—	2	3,475
Totals	16	34,447	11	9,483	27	43,930

COMPARISON OF 1943-44 AND 1944-45 TESTING

Table 5 gives the comparison of the 1943-44 and 1944-45 testing results for the different counties. Increases in the number of tested flocks and in the number of non-reacting flocks were observed only in five counties, Bristol, Essex, Middlesex, Plymouth, and Worcester. Decreases in the number of tested birds were observed in Berkshire, Franklin, Hampden, Hampshire, and Norfolk counties.

Table 5. Comparison of 1943-44 and 1944-45 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1943-44 Season					
Barnstable.....	3	5,005	5,005	0.00	3
Berkshire.....	8	13,579	13,579	0.00	8
Bristol.....	55	108,241	115,263	0.10	53
Dukes.....	1	1,859	3,695	0.11	1
Essex.....	51	91,192	91,280	0.03	49
Franklin.....	27	46,947	47,765	0.13	24
Hampden.....	24	24,617	25,528	0.28	21
Hampshire.....	33	39,059	45,726	0.08	32
Middlesex.....	70	141,877	142,012	0.23	60
Norfolk.....	32	66,073	66,124	0.002	31
Plymouth.....	38	87,525	93,325	0.07	36
Worcester.....	71	136,092	142,294	0.11	68
Totals.....	413	762,066	791,596	0.11	386
1944-45 Season					
Barnstable.....	3	5,588	5,588	0.07	2
Berkshire.....	4	9,028	9,028	0.00	4
Bristol.....	58	111,716	132,647	0.02	56
Dukes.....	1	2,206	2,206	0.00	1
Essex.....	66	116,309	119,207	0.05	62
Franklin.....	24	40,423	42,445	0.05	21
Hampden.....	18	20,052	24,716	0.20	18
Hampshire.....	28	30,808	33,830	0.12	26
Middlesex.....	95	178,129	184,251	0.12	89
Norfolk.....	30	64,770	69,560	0.10	28
Plymouth.....	50	107,607	139,370	0.43	45
Worcester.....	81	149,845	181,139	0.008	79
Totals.....	458	836,481	943,987	0.12	431

For the State as a whole, a comparison of the results for the past two years is given in the following summary:

	1943-44	1944-45	Increase
Tested flocks.....	413	458	45
Tested birds.....	762,066	836,481	74,415
Tests.....	791,596	943,987	152,391
Non-reacting flocks.....	386	431	45
100 percent tested, non-reacting flocks.....	354	413	59
Birds in 100 percent tested, non-reacting flocks.....	692,556	776,089	83,533
Infected flocks.....	27	27	—
"Breaks".....	17	21	4

The average percentage of reactors did not change significantly over the previous season. Of the total birds tested, 93 percent were in 100 percent tested non-reacting flocks.

These results show that the testing work has increased markedly during the past year. It is hoped that the number of positive flocks can be reduced and that the number of "breaks" can be maintained at a very low minimum.

TWENTY-FIVE-YEAR TESTING SUMMARY

A 25-year testing summary is presented in Table 6. This summary reveals that through annual testing of flocks and by employing effective eradication and prevention measures, flocks can be established and maintained free of pullorum disease.

Table 6. Twenty-Five-Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: This past year 30 tested flocks were classified with intermittent testing history. These flocks contained 62,381 birds. The percentage of positive tests was 0.42 which is considerably above the average for all samples tested. It is very evident that flocks with an intermittent testing history usually contain more infection than flocks tested annually. Flocks should be tested annually in order to determine their pullorum status. The occurrence of "breaks" is well recognized and if flocks are tested annually, such "breaks" can be detected before the flocks become heavily infected. Eradication is far more difficult in heavily infected flocks. Consequently annual testing will prevent some flocks from becoming heavily infected. The records reveal, as was pointed out in a previous section, that a number of infected flocks have been identified in which only one or two infected birds were detected. The early detection of infection has prevented considerable loss to the flock owner.

This past season 29 flocks, representing 25,945 birds, were partially tested. In 18 of these flocks, no reactors were detected. However, this does not mean that the untested birds in these flocks were also free of infection. Using partially tested flocks for breeding purposes is following a breeding program with a possible hazard of pullorum disease. Furthermore, partially tested flocks cannot be officially recognized by the Massachusetts Department of Agriculture even though no reactors are found among the tested birds.

Early Testing: Flock owners are requested again to test all or part of their flocks as early as possible in order to relieve the congestion during the months of October, November, December, and January. The volume of testing has reached such proportions that it is impossible with present facilities to test more samples during the peak months. It is hoped that more flock owners will cooperate in having their birds tested earlier in the season. The following data shows the distribution of tests by months:

Month	Tests	Month	Tests
April, 1944	18,045	October	138,076
May	8,385	November	182,862
June	5,550	December	164,749
July	12,303	January, 1945	145,718
August	31,030	February	115,170
September	68,956	March	84,197

In conclusion it may be emphasized again that flock owners should take every possible precaution to prevent the introduction of pullorum infection. The known and suspected channels of infection should be kept under the strictest vigilance at all times.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 125

JULY 1945

**Inspection of Commercial
Feedstuffs**

By Feed Control Service Staff

This, the fifty-first report of feeding stuffs inspection, contains, in addition to information required by statute, carotene determinations on commercial poultry mashes and alfalfa products and other data of importance in determining the value of a feedstuff.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Philip H. Smith¹

The first feeding stuffs act in the United States became effective in Massachusetts on July 1, 1897. Since that time bulletins have been issued at least annually and if a need was indicated, semi-annually. This is the fifty-first of the series.

Early feed legislation required little of the manufacturer but was sufficient in a general way to protect the consumer from fraud. As there were but few commercial feedstuffs, a considerable part of each bulletin was devoted to advice on the home mixing of rations, a function later cared for by Extension Service which was not then in existence.

About the turn of the century the mixing of prepared rations by commercial millers began and has gradually increased up to the present. The sale of ready rations now far exceeds the sale of ingredients for home mixing.

The manufacture of efficient feeds is a highly specialized business. Many of the larger companies maintain laboratories and experimental farms in an attempt to keep pace with progress of knowledge in the field of nutrition. To conform to the guarantee requirements of the State law for protein, fat, fiber, and ingredient content is relatively simple. We now know that rations can be made which conform to all these requirements and yet prove far from satisfactory because various vitamins and trace elements are also essential in a ration. Our knowledge of the significance of these is far from complete but progress is being made.

With a view to furnishing information somewhat broader than that required by the feeding stuffs act, Control Service is interested in making other analyses and assays so far as time and facilities permit. The data thus secured are presented as a part of the annual bulletins.

Credit should be extended to the industry for meeting so satisfactorily the abnormal conditions of the present. While substitutions in ingredients have often been necessary because of actual shortages and regulations, there has been no general attempt to make capital out of the situation. Adulteration and misrepresentation have been no greater than in normal times.

¹The following staff members assisted in the inspection: John W. Kuzmeski, Albert F. Spelman, C. Tyson Smith, and Henry B. Rodman, chemists; Frederick A. McLaughlin, microscopist; James T. Howard, inspector; Joseph A. Martell, laboratory assistant; Cora B. Grover, clerk.

Complete Average Analyses of Commercial Feeds Collected (Per Cent)

Number of Analyses	Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
			Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
1	Albers Milling Co. Albers Proven Call Manna	10.3	25.1	25.0	4.4	4.0	48.5	4.5	6.0	7.2
3	Allied Mills, Inc. Economy 16% Dairy Ration	10.8	18.6	16.0	3.5	3.0	54.2	6.9	9.0	6.0
1	Economy Feaving Mash with Fortified Sardine Oil	11.7	19.7	18.0	3.2	3.0	53.7	4.9	8.0	6.8
2	Wayne All Mash Egg	11.8	15.6	15.0	3.1	3.0	55.9	6.3	8.0	7.3
2	Wayne Breeder Mash	11.7	21.5	20.0	4.7	3.5	46.6	7.8	8.0	7.7
1	Wayne Chick & Broiler Ration	10.9	20.7	19.0	3.8	3.0	48.5	7.8	8.0	8.3
1	Wayne Chick Starter	11.9	19.7	18.0	3.7	3.0	52.3	5.9	7.0	8.5
2	Wayne Complete Calf Feed	10.9	17.9	16.0	3.9	3.0	50.6	6.0	9.0	7.3
1	Wayne 24% Dairy Ration	11.3	25.9	24.0	3.8	3.5	45.1	7.8	9.0	6.2
3	Wayne 20% Dairy Feed	11.3	21.0	20.0	3.9	3.0	50.3	7.1	10.0	6.4
2	Wayne 18% Dairy Ration	11.5	20.0	18.0	3.1	3.0	54.0	6.5	10.0	4.9
4	Wayne 16% Dairy Ration	11.8	17.0	16.0	3.7	3.0	54.0	7.0	10.0	6.5
5	Wayne Egg Mash	11.0	21.8	20.0	4.0	3.0	47.7	7.5	9.0	8.0
3	Wayne Fitting Ration	11.9	16.4	12.0	3.8	3.0	52.8	8.2	9.0	6.9
1	Wayne Fishing Mash	9.2	21.0	20.0	3.9	3.0	51.2	4.5	6.0	10.2
4	Wayne Fishing Mash	10.6	17.4	16.0	3.7	3.0	54.3	7.2	7.0	6.8
1	Wayne Growing Mash	12.0	12.5	9.5	3.6	2.5	59.5	9.2	10.0	3.2
2	Wayne Horse Feed	11.8	26.9	26.0	4.1	3.0	38.2	8.4	10.0	10.6
3	Wayne Pork Maker	12.0	15.6	14.0	2.7	3.0	58.9	4.9	7.0	5.9
1	Wayne Turkey Growing Mash with Fortified Sardine Oil	11.0	24.6	20.0	3.9	3.0	46.4	6.6	8.0	7.5
1	A. P. Ames & Co. Ames Complete Cycle Mash	11.4	17.8	16.0	3.2	4.0	54.3	5.5	6.0	7.8
1	Ames Egg Mash	10.8	26.7	20.0	2.9	4.0	49.4	5.0	7.0	11.2
1	Ames 18% Milk Maker	11.3	18.1	18.0	4.1	4.0	50.2	6.3	10.0	10.0
1	Ames Starter & Broiler Ration	10.9	22.0	19.0	3.1	4.0	49.4	5.6	7.0	9.0

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num- ber of Anal- yses	Manufacturer and Brand	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
			Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
E. W. Bailey & Co.										
1	Bailey's Pennant Brand Breeder Mash	11.9	19.8	20.0	3.8	3.0	51.3	4.9	7.0	8.3
1	Bailey's Pennant Brand Calf Ration	16.8	16.8	15.0	3.8	3.0	52.8	7.3	8.5	7.7
1	Bailey's Pennant Brand Complete Egg Ration	11.6	15.8	16.0	3.5	3.0	54.2	6.7	7.0	8.2
1	Bailey's Pennant Brand Complete Grower	12.1	16.4	15.0	3.0	3.0	56.1	5.4	7.0	9.4
1	Bailey's Pennant Brand Complete Layer-Breeder	10.8	17.2	16.0	3.0	3.0	53.0	4.6	8.0	7.1
1	Bailey's Pennant Brand 18 Per Cent Dairy Ration	18.6	18.0	18.0	4.0	3.0	56.9	7.2	8.5	5.5
1	Bailey's Pennant Brand Growing Mash	11.6	18.1	18.0	3.7	3.0	52.6	6.5	7.0	7.5
1	Bailey's Pennant Brand Horse Feed	13.1	13.4	10.5	3.7	3.0	56.4	8.5	9.0	4.9
1	Bailey's Pennant Brand Laying Mash	11.9	22.5	20.0	3.6	3.0	47.9	6.3	7.0	7.8
1	Bailey's Pennant Brand Pig Feed	12.4	18.4	17.0	3.3	3.0	54.7	5.1	7.0	6.1
Barber & Bennett, Inc.										
1	Double Value Milk Ration	10.1	21.1	18.0	3.9	3.5	49.1	9.6	9.0	6.2
3	Fort Orange 12% Fitting and Calf Grain Ration	14.5	14.5	12.0	3.2	4.0	58.6	6.6	8.5	5.0
1	Fort Orange Golden Test Ration	11.5	19.6	18.0	4.3	4.5	53.0	6.6	8.5	5.0
1	Fort Orange Growing Mash	11.0	18.4	17.0	3.6	4.0	53.6	6.1	7.0	7.3
2	Fort Orange Horse Feed	12.2	13.0	9.0	4.0	3.0	58.8	8.3	10.0	3.7
2	Fort Orange Laying Mash	11.3	19.3	18.0	3.2	4.0	53.1	5.3	7.0	7.8
1	Fort Orange Milk Ration	10.9	17.9	16.0	3.6	4.0	54.6	7.3	8.5	5.7
Beacon Milling Co., Inc.										
2	Auburn "16"	12.4	16.7	16.0	3.5	3.25	53.3	7.6	10.0	6.5
2	Beacon Battery Growing Ration	11.4	17.2	16.0	3.2	3.0	54.8	6.6	7.5	6.8
1	Beacon Battery Laying Ration	11.5	16.9	16.0	3.6	3.0	53.8	6.4	7.5	7.8
1	Beacon Calf Grain	12.1	15.6	14.0	3.6	4.0	53.9	7.3	10.0	7.5
1	Beacon Calf Starter	13.2	17.1	19.0	4.5	3.5	52.7	6.4	7.0	6.1
1	Beacon's Carga Horse Feed	12.1	12.8	10.0	3.7	2.5	58.2	7.9	9.0	5.3
1	Beacon C-C Pellets	12.3	16.4	15.0	6.1	1.0	54.8	5.0	6.5	5.4
2	Beacon Complete Starting Ration	11.9	21.4	20.0	4.2	3.0	50.2	5.1	5.0	5.5
1	Beacon Emergency Broiler Feed	10.7	22.3	20.0	4.2	3.0	49.0	9.3	7.0	7.5
3	Beacon Emergency Test Cow Ration	12.7	18.2	16.0	3.9	4.0	52.4	7.1	9.0	5.7
3	Beacon Fitting Ration	13.1	14.7	14.0	3.5	3.5	55.0	7.3	8.0	9.5
1	Beacon Flething Pellets	11.8	20.3	17.0	3.5	3.0	50.9	6.0	7.5	7.5
1	Beacon Growing Mash	11.8	18.8	18.0	3.7	3.0	53.0	6.5	7.5	7.8
1	Beacon Hog Feed	11.4	19.9	18.0	3.4	3.5	52.9	5.5	7.0	6.9
3	Beacon Special "18"	12.4	19.4	18.0	3.7	3.5	51.4	7.2	9.0	5.9
3	Beacon Turkey Fitting Ration	12.8	13.8	10.0	2.9	3.0	59.8	6.9	7.0	3.8
2	Be-Co-Lass	11.4	21.0	20.0	3.6	3.0	48.6	6.4	9.0	9.0
2		14.7	12.9	11.0	2.8	1.0	49.5	12.5	16.0	7.6

1	Blatchford Calf Meal Co.	10 0	31.9	31.0	3.7	3.0	41.2	5.8	5.5	7.4
	Blatchford V-D 20									
1	Blatchley & Ballard, Inc.	10 9	19.1	18.0	3.7	3.0	48.8	9.7	12.0	7.8
	Bee Brand 18% Dairy Ration									
1	Bee Brand Growing Mash	11 6	17.2	16.0	3.0	4.0	53.2	6.0	7.0	8.1
1	Bee Brand Hog Ration	11 0	19.3	17.0	4.5	3.0	48.0	8.6	8.0	7.7
1	Bee Brand Laying Mash	11 3	19.3	18.0	3.5	4.0	51.3	9.8	7.0	7.8
1	Bee Brand Starter & Broiler Mash	11.2	20.7	17.0	2.6	4.0	54.7	5.5	7.0	5.3
2	Borden Grain Co.	10 8	22.5	18.0	4.3	4.0	46.3	8.4	10.0	7.7
	Borden's Dairy Feed									
2	Borden's Laying Mash	11 0	19.9	19.0	4.0	4.0	50.2	6.3	7.0	8.6
1	Borden's Starter & Growing Feed	9.5	21.3	17.0	4.1	4.0	48.8	5.8	6.0	10.5
1	George B. Brown Corp.	10 5	16.7	17.0	3.4	5.0	53.3	5.8	10.0	10.3
	Brown's Egg Mash									
1	Community Service, Inc.	11 3	15.0	14.0	3.6	4.0	59.4	6.3	8.0	4.4
	Community Complete Pig Feed									
1	Community 18% Dairy Ration	10.3	21.2	16.0	5.1	4.0	48.5	9.8	10.0	5.1
1	Community 16% Dairy Ration	11 2	17.7	16.0	4.4	3.5	52.2	9.8	11.0	4.7
1	Community Fitting Ration	10 9	18.6	14.0	4.6	3.5	51.9	8.9	8.5	5.1
1	Community Growing Mash	11.1	21.7	18.0	2.6	4.0	50.1	6.4	6.5	8.1
1	Community Laying Mash	11.1	21.3	18.0	3.4	4.0	52.6	4.9	6.5	6.7
1	Community Starter & Grower Mash	10 9	20.4	17.0	3.8	4.0	53.2	5.0	6.5	6.7
1	Courcy Grain Co.	10 3	19.7	20.0	3.4	4.0	52.0	7.5	8.0	7.1
	Courcy's Dairy Feed									
1	Courcy's Eastern Milk Laying Mash	10 8	17.3	18.0	3.7	4.0	53.1	6.0	7.0	8.5
1	Cover Grain & Feed Co.	10 1	18.9	20.0	3.6	3.0	52.0	6.0	7.0	9.4
	C & P Grade A Laying Mash									
1	C & P Growing Mash	18.3	18.3	17.0	3.5	3.0	51.6	5.6	7.0	10.8
1	C & P Own 20 Dairy Ration	10 3	18.1	20.0	3.3	4.0	53.1	8.6	9.0	6.6
1	C & P Starter & Broiler Ration	10 5	18.4	17.0	3.1	4.0	51.3	5.8	6.0	10.9
1	Chas. M. Cox Co.	10 4	21.7	24.0	3.4	4.5	50.7	6.3	4.5	7.5
	Winthmore Calf Starter Pellets									
3	Winthmore Complete Breeder Ration	12.7	16.4	15.0	3.7	3.0	56.3	4.9	6.0	6.0
3	Winthmore Complete Egg Ration	11 8	16.3	15.0	2.8	3.0	58.1	4.7	6.0	6.3
2	Winthmore Complete Growing Ration	12.4	15.0	15.0	3.0	3.0	59.2	4.5	7.0	5.9
1	Winthmore Duck Starter Pellets	13 6	18.0	18.0	3.4	3.0	53.2	4.8	6.0	6.5
1	18% Lay and Grow Mash	10.1	19.2	18.0	2.7	3.25	54.0	5.2	8.0	8.8
3	Winthmore 14 Fitting Ration	12.3	15.2	14.0	4.1	4.0	56.7	6.6	8.0	5.1
1	Winthmore Growing Mash	11 0	20.0	17.5	3.1	3.0	52.4	4.9	7.0	8.6
1	Winthmore Laying Mash	11.7	20.4	20.0	4.9	3.0	48.4	5.5	9.1	9.1
1	Winthmore Pig and Hog Feed	12.2	18.3	17.0	3.7	3.0	52.9	6.1	9.0	6.8

Complete Average Analyses of Commercial Feeds Collected (Per Cent) —Continued

Num-ber of Anal-yses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Chas. M. Cox Co. — Cont.										
1	Wirtmore V Poultry Flush	10.4	18.5	17.5	3.0	3.0	55.0	4.7	6.0	8.4
3	Wirtmore 16 Reconst. Ration	12.5	17.1	16.0	3.9	3.5	53.6	6.9	8.0	6.0
3	Wirtmore Standard 20 Dairy Ration	12.3	20.9	20.0	3.8	3.0	49.1	7.7	8.5	6.2
3	Wirtmore V Standard 18 Dairy Ration	11.4	19.3	18.0	3.2	3.0	52.5	7.4	8.5	6.2
2	Wirtmore V Stock Feed	11.3	13.0	10.0	2.8	2.0	58.5	8.1	11.0	6.3
1	Wirtmore Stock Feed	13.2	11.5	10.0	2.8	3.0	60.0	6.9	11.0	5.6
1	Wirtmore Super Pellets	11.8	22.0	20.0	5.1	3.0	47.0	5.9	10.0	7.6
4	Wirtmore Turkey Fatening Ration Pelleted	12.1	17.9	16.0	3.5	3.0	54.9	5.0	7.0	6.6
3	Wirtmore Turkey Growing Ration	10.7	21.5	20.0	3.1	3.0	50.7	5.9	7.0	8.1
2	Wirtmore V Turkey Starter	10.1	24.8	25.0	4.1	3.0	46.4	6.4	7.0	8.2
1	Wirtmore Twin-Mix Calf Ration	12.8	17.4	16.0	4.7	4.0	52.2	6.0	7.0	6.9
Crawford Brothers, Inc.										
1	Crawford's Growing Mash	9.9	23.3	18.0	4.8	4.0	49.1	7.2	8.0	5.7
Curley Grain & Fuel Co.										
1	C Crystal Complete Growing Mash	11.0	19.9	15.0	3.9	4.0	50.6	6.1	6.0	8.5
1	C Crystal Complete Laying Mash	10.9	19.9	15.0	3.7	4.0	49.3	6.6	6.0	9.5
1	C Crystal Dairy Ration 18%	11.7	20.8	18.0	4.1	4.0	50.0	5.8	13.0	7.9
1	C Crystal Growing Mash	10.8	19.6	16.0	4.1	4.0	49.6	6.4	7.0	9.5
1	C Crystal Laying Mash	10.8	20.3	18.0	3.8	3.5	49.6	6.7	6.0	8.8
Dalley Mills, Inc.										
2	Dalley's All Mash Grower	11.3	15.9	14.0	2.6	3.5	57.2	7.1	8.5	5.9
1	Dalley's Double Diamond Broiler Mash	10.7	19.4	18.0	4.2	3.5	50.2	8.7	7.0	6.8
3	Dalley's Egg Producer Mash	11.0	20.7	17.0	3.7	3.5	48.7	7.6	7.0	8.3
1	Dalley's Erosionex	11.7	19.9	22.0	2.7	4.0	56.2	4.7	7.0	4.8
2	Dalley's Fitting Ration	13.3	17.0	14.0	3.4	3.25	54.5	5.7	7.0	6.1
3	Dalley's 18% Milk Producer	11.3	20.1	18.0	4.0	3.0	49.4	8.4	12.0	6.8
2	Dalley's Pork Producer	12.1	17.0	17.0	3.8	3.5	54.1	6.2	7.0	6.8
2	Dalley's Range Growing Mash	10.5	19.0	16.0	3.7	3.5	50.9	7.6	7.0	8.3
1	Dalley's Revitalizer	10.9	13.3	13.0	2.9	3.5	66.6	3.1	4.0	3.2
1	Dalley's Special Pig and Hog Ration	10.2	16.1	13.0	3.6	3.25	54.5	8.7	10.0	6.9
2	Dalley's Starter and Broiler Mash	19.0	18.8	20.0	4.0	3.5	50.3	8.0	7.0	8.9
1	Dalley's Super All Mash Layer	9.5	19.2	14.0	4.1	3.5	51.1	8.2	8.0	7.9
2	Dalley's Super 18% Dairy Ration	11.3	20.3	18.0	3.9	3.25	47.8	8.6	9.0	8.1
1	Dalley's Super 16% Dairy Ration	15.1	18.2	16.0	3.7	3.25	46.5	7.9	8.0	8.0
1	Dalley's Super Growing Mash	11.5	19.4	18.0	3.7	4.0	50.2	7.5	7.0	7.7
1	Dalley's Super Laying Mash	11.2	23.9	20.0	3.6	3.5	44.6	6.6	7.0	10.1

INSPECTION OF COMMERCIAL FEEDSTUFFS

Dairy Farmers' Union Feeds										
1	Union Broiler Mash	11.6	21.9	18.0	3.8	4.0	44.6	8.1	8.0	10.0
1	Union Dairy Ration	10.9	19.7	18.0	5.0	3.0	49.2	9.9	9.0	5.3
1	Union Lay & Grow Mash	11.5	21.1	18.0	3.5	4.5	47.1	7.6	8.0	9.2
Delaware Mills, Inc.										
1	Delaware Calf Meal (Pellets)	11.8	22.3	22.0	3.5	4.0	53.1	5.2	7.0	4.1
1	Delaware 18% Dairy Feed	11.7	17.1	18.0	3.4	4.0	56.2	7.1	11.0	4.5
2	Delaware Egg Mash	12.9	19.2	18.0	3.1	3.0	54.3	5.1	9.0	5.7
1	Delaware Fitting Ration	10.7	14.0	17.0	2.4	4.0	60.4	6.2	10.0	5.1
1	Delaware Growing Mash	10.9	21.7	14.0	4.3	3.0	48.5	8.1	7.0	6.5
2	Delaware Horse Feed	11.9	11.9	9.0	4.0	3.0	57.2	11.2	10.0	3.8
2	Delaware Laying Mash	11.3	19.9	20.0	3.6	3.0	52.1	6.9	8.0	6.2
1	Indian Sweet 20% Dairy Feed	14.6	16.4	20.0	4.6	3.0	50.3	7.8	11.0	6.3
2	Indian Sweet 18% Dairy Feed	12.7	18.2	18.0	3.7	3.0	53.3	6.8	11.0	5.3
Frank Diaulo										
1	Diaulo's Broiler Ration	11.9	19.1	18.0	3.7	5.0	51.0	5.5	6.0	8.8
1	Diaulo's Fancy Chick Growing Mash	11.6	17.7	16.0	4.3	4.0	52.2	5.4	5.0	8.8
F. Diehl & Son, Inc.										
2	Diehl's Dairy Feed	11.9	21.8	18.0	4.0	3.0	48.6	7.1	14.0	6.6
1	Diehl's Dry Mash	11.5	20.3	16.0	3.9	3.0	47.8	7.7	12.0	8.8
Dietrich & Gambrell, Inc.										
3	D & G All Purpose Complete Ration	11.2	17.1	15.0	4.3	3.5	53.2	6.9	8.0	7.3
1	D & G Broiler Mash	11.0	19.4	18.0	3.5	4.0	52.7	5.9	7.0	7.5
2	D & G Fishing Mash	10.7	18.0	15.0	4.1	3.5	53.5	7.4	6.5	7.5
1	D & G Gambrell's Growing Mash	10.7	20.4	18.0	3.6	3.5	50.3	7.0	8.0	8.0
1	D & G Gambrell's Laying Mash	10.6	21.3	20.0	3.7	3.5	50.9	6.3	8.0	7.2
1	D & G Pig & Hog Meal	10.8	19.8	18.0	3.7	3.5	52.0	7.5	8.0	6.2
2	D & G Poultry Flush	10.9	13.4	13.0	5.4	2.5	59.9	4.4	7.0	6.2
1	Frederick 20% Dairy Feed	12.7	20.2	20.0	4.2	3.5	47.4	8.8	12.0	6.7
2	Frederick Laying Mash	11.2	19.5	18.0	3.5	3.5	52.8	6.4	8.0	6.6
2	Gambrell's Growing Mash	11.0	20.3	18.0	4.0	3.5	51.2	5.9	8.0	7.0
1	Pen Mar 20% Dairy Feed	13.2	19.2	20.0	4.6	3.5	50.3	6.9	10.0	5.8
1	Pen Mar 18% Dairy Feed	12.6	19.1	18.0	3.5	3.5	52.4	6.5	10.0	5.9
1	Pig & Hog Meal	11.3	20.8	15.0	4.5	3.5	48.7	6.7	8.0	8.0
J. L. Dummell & Son										
1	Excel Mash with Oil	11.2	21.3	19.0	5.4	5.0	48.0	5.9	6.0	8.2
Eastern States Farmers' Exchange										
1	Eastern States All-Mash Developer	11.4	16.0	14.0	3.1	2.5	58.9	5.1	6.5	5.5
1	Eastern States All-Mash Egg	10.9	17.7	15.5	3.4	2.0	50.1	6.6	6.5	11.3
1	Eastern States Calf Starter	11.6	23.1	23.0	3.4	3.0	49.9	5.0	6.5	6.4
2	Eastern States Calving Ration	18.5	10.8	10.0	2.0	1.5	47.2	12.7	18.0	8.9
2	Eastern States Developer	10.5	18.6	18.0	3.1	2.5	52.8	6.1	7.5	8.9

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num-ber of Analy-ses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Eastern States Farmers' Exchange—Cont.										
1	Eastern States Egg Mash	10.2	21.4	20.0	4.7	2.0	46.6	6.5	7.0	10.6
1	Eastern States Eighteen	11.8	20.4	18.0	4.4	3.5	52.1	6.8	8.5	4.5
1	Eastern States Fitting Ration	13.8	14.0	14.0	3.8	3.0	53.8	7.9	9.5	6.3
2	Eastern States Horse Feed	14.3	11.7	10.5	3.6	3.0	55.5	6.5	10.0	4.4
1	Eastern States Pig Starter & Breeder	12.0	17.9	18.0	3.1	2.0	55.5	5.8	8.0	5.7
2	Eastern States Pork Builder	15.6	15.6	14.0	3.2	2.0	58.8	5.0	9.5	5.5
3	Eastern States Sixteen	11.5	18.4	16.0	4.1	3.5	53.9	6.8	9.5	5.3
1	Eastern States Stock Feed	12.5	18.5	11.0	2.1	3.5	59.4	6.4	9.5	4.1
1	Eastern States 28% Supplement	10.9	29.6	28.0	3.9	3.5	59.9	6.5	9.5	9.2
2	Eastern States Turkey-Grower	10.5	21.4	20.0	3.8	2.0	50.5	6.2	7.5	6.2
1	Eastern States Turkey Start	10.2	24.8	25.0	3.5	2.0	47.6	6.0	6.0	7.9
Elmore Milling Co., Inc.										
1	Elmore Breeder Mash (Pellets)	10.7	21.5	20.0	4.1	4.0	51.1	5.3	8.0	7.3
1	Elmore Complete Growing Ration	11.6	21.3	15.0	2.7	3.5	51.6	4.7	8.0	8.1
1	Elmore Complete Layer and Breeder	11.3	18.1	15.0	3.7	3.5	53.5	5.5	8.0	7.9
3	Elmore Complete Market Egg Mash	11.2	19.0	15.0	3.8	3.5	52.1	7.3	8.0	6.6
1	Elmore Egg Mash Pellets	11.3	18.6	18.0	3.2	4.0	52.0	5.6	8.0	8.4
1	Elmore Fitting Ration	11.1	17.0	14.0	3.5	4.0	54.7	9.2	9.0	4.5
2	Elmore fleshing Pellets	11.9	18.1	15.0	3.4	3.5	51.2	7.1	8.0	8.5
2	Elmore Growing Mash	11.0	19.1	17.0	3.9	3.0	52.4	5.9	8.0	8.0
1	Elmore Hog Ration	11.5	17.0	15.0	3.9	4.0	53.8	7.2	7.0	5.2
2	Elmore Improved Calf Starter	11.9	20.0	20.0	4.3	4.0	52.2	4.5	8.0	7.1
1	Elmore M.A.C. Laying Mash	10.8	23.8	18.0	5.3	3.5	46.7	7.4	8.0	6.0
3	Elmore Milk Grains "Eighteen"	10.7	24.4	18.0	4.5	4.0	47.0	8.7	10.0	4.7
1	Elmore Milk Grains "Sixteen"	11.1	19.1	16.0	3.1	4.0	51.5	9.6	10.0	5.6
1	Elmore Turkey Breeders Mash (Pellets)	11.5	18.1	20.0	4.5	3.5	50.5	7.0	7.0	8.4
1	Elmore Turkey Finisher (Fattener)	11.6	19.2	17.0	3.2	4.0	52.4	6.3	8.0	7.3
3	Elmore Turkey Growing Mash	10.3	23.3	18.0	3.9	3.5	46.8	6.8	8.0	8.9
1	Granger 18% Dairy Ration	9.5	22.9	18.0	4.6	3.5	46.5	10.9	11.0	5.6
John W. Eshelman & Sons										
1	Eshelman Pennsy 16 Dairy Feed	11.7	17.7	16.0	4.0	3.0	50.5	9.5	11.0	6.6
1	Eshelman Red Rose Broiler Ration	11.4	18.4	18.0	3.4	3.75	53.1	7.2	7.5	6.9
1	Eshelman Red Rose Calf Starter	10.5	22.3	22.0	4.0	4.0	53.5	4.0	5.0	5.7
1	Eshelman Red Rose 24 Dairy Feed	11.8	24.9	24.0	4.5	4.0	45.4	7.9	11.0	6.3
2	Eshelman Red Rose 18 Dairy Feed	11.0	21.2	18.0	4.2	4.0	49.7	7.5	9.0	5.6
2	Eshelman Red Rose 16 Dairy Feed	12.0	18.2	16.0	4.2	4.0	51.1	8.5	11.0	6.0
1	Eshelman Red Rose Growing Mash	10.5	18.1	16.0	3.9	3.5	50.8	8.7	7.5	8.0
1	Eshelman Red Rose 85 Horse Feed	11.7	13.6	9.0	4.2	3.0	52.9	12.7	10.0	4.9
2	Eshelman Red Rose Laying Mash	10.7	20.9	20.0	3.9	3.5	49.0	8.0	7.5	7.5

1	Eshelman Red Rose Pig and Hog Meal	10.9	19.4	18.0	3.7	3.5	51.1	5.9	10.0	9.0
1	Eshelman Red Rose Starter & Grower	11.1	17.4	16.0	3.5	3.5	52.4	7.5	7.0	8.1
1	Eshelman Red Rose Turkey Starter & Grower	10.4	22.4	20.0	4.1	3.5	47.3	8.3	8.0	7.5
Essex County Co-operative Farming Assoc.										
1	S-X All-Mash Growing	11.6	17.7	15.0	3.1	3.75	57.1	4.7	6.0	5.8
1	S-X Breeder Mash Pellets	10.4	21.2	20.0	4.0	4.0	51.3	6.0	7.0	7.1
1	S-X 18% Dairy Feed	11.8	18.5	18.0	3.5	3.5	53.3	7.4	8.5	5.7
1	S-X Egg Mash	11.1	20.8	20.0	3.2	4.0	51.2	5.9	7.0	7.8
1	S-X 14% Fitting	12.1	16.3	14.0	3.9	3.5	55.4	7.3	8.5	5.0
1	S-X Growing Mash	11.4	21.3	18.5	3.5	3.75	51.3	5.5	7.0	7.0
George A. Fair										
1	Fair Square Dairy Feed	12.1	18.5	20.0	4.0	4.5	51.8	7.1	8.0	6.5
1	Fair Square Growing Mash	10.8	16.3	18.0	4.3	4.0	51.2	6.8	6.5	10.6
1	Fair Square Laying Mash	11.2	16.2	15.0	4.0	4.0	53.6	5.4	6.5	9.8
1	Fair Square Starter and Broiler Mash	10.6	17.6	18.0	4.1	4.0	50.0	6.7	5.0	11.0
Flory Milling Co., Inc.										
1	Flory All-Mash Egg & Breeder Ration Pellets	10.8	17.7	16.0	3.7	3.5	56.2	5.0	7.0	6.6
2	Flory Complete All-Mash Ration	11.2	16.8	15.5	2.9	3.0	55.1	6.0	7.0	8.0
3	Flory 18% Dairy Feed	10.7	18.3	18.0	3.4	3.0	52.2	8.6	10.0	6.8
1	Flory's Horse Feed	13.3	11.3	9.0	4.1	2.5	55.9	11.0	10.0	4.4
1	Flory 16% Dairy Feed	9.7	17.5	16.0	4.2	3.5	55.6	8.0	10.0	5.0
1	Flory Fattener & Flesher Mash	9.5	19.3	14.0	3.6	5.0	57.5	5.3	7.0	1.8
1	Flory Fitting Ration	11.4	15.5	12.0	1.2	3.5	51.8	9.9	9.0	7.2
1	Flory Growing Mash	10.6	20.0	18.0	2.9	3.0	48.9	7.3	7.5	10.6
1	Flory Hog Meal	11.8	17.5	15.0	2.5	3.0	48.9	5.7	9.0	6.8
1	Flory Rabbit Pellets	10.9	16.6	14.0	2.8	3.0	52.5	7.6	9.0	9.6
1	Flory Turkey Grower Pellets	11.1	21.5	20.0	3.7	3.0	46.0	7.4	7.5	10.3
4	National 18% Dairy Feed	11.3	20.6	18.0	3.9	3.0	48.5	9.5	11.0	6.2
Fred A. Fountain										
1	Fountain's Breeder Mash	12.1	19.8	18.0	4.8	4.5	47.5	6.8	6.0	9.0
2	Fountain's Growing Mash	12.2	17.8	16.0	4.0	4.0	54.0	5.4	7.0	6.6
2	Fountain's Laying Mash	12.3	19.2	18.0	4.1	4.0	50.9	5.2	7.0	8.3
2	Fountain's Starting and Broiler Ration	11.6	20.8	17.5	4.2	4.0	50.8	5.3	7.0	7.3
J. B. Garland & Son, Inc.										
2	Garland Complete Starting and Broiler Mash	11.1	19.8	17.0	3.8	3.5	50.3	6.3	7.0	8.7
1	Garland 20% Dairy Ration	11.8	21.7	20.0	4.6	4.0	46.8	8.5	10.0	6.6
2	Garland 16% Dairy Ration	12.2	16.8	16.0	4.0	3.5	52.1	7.4	9.0	7.5
4	Garland Fitting Ration	12.3	16.0	16.0	3.6	3.5	55.2	6.0	7.0	6.9
6	Garland Growing Mash with Cod Liver Oil	10.9	20.4	14.0	3.9	3.0	50.8	6.8	7.0	8.0
1	Garland Horse Feed	14.4	11.4	10.0	3.4	3.0	58.9	8.1	9.0	3.8
4	Garland Laying Mash with Cod Liver Oil	10.7	19.6	18.0	3.8	3.0	50.9	6.7	7.0	8.3
3	Garland Pig & Hog Ration	13.0	17.3	17.0	4.1	3.5	51.4	6.2	8.0	8.0
2	Garland Turkey Starting & Growing Mash	10.7	9.5	8.5	4.1	1.0	58.8	11.5	12.0	5.4
2	Garland Complete Laying Ration	11.4	19.7	15.0	4.2	3.0	48.5	6.3	7.0	7.9
1	Royal 16% Dairy Ration	11.9	19.4	16.0	3.2	3.0	50.7	7.1	7.0	6.5

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num-ber of Anal-yses	Manufacturer and Brand	Water		Protein		Fat		Nitro-gen		Fiber		Ash
		Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Ex-tract	Found	Guar-anteed	
General Mills, Inc., Farm Service Division												
1	Farm Service Breeder Mash	12.0	19.0	21.1	3.0	3.7	50.5	5.5	8.0	7.2		
2	Farm Service Dandy 18% Dairy	10.8	18.0	4.2	3.0	4.2	49.9	9.9	11.5	6.2		
2	Farm Service Horse Feed	12.5	9.0	3.3	3.0	3.3	61.0	8.2	9.5	3.2		
2	Farm Service Laying Mash	11.5	20.0	3.8	3.5	3.8	50.8	6.6	8.0	7.1		
1	Farm Service Starter & Broiler	10.3	18.0	4.3	3.5	4.3	51.8	7.9	8.0	6.2		
1	Farm Service Stock Feed	10.2	8.5	3.1	3.0	3.1	59.4	10.3	12.0	4.8		
General Mills, Inc., Larrowe Division												
1	Larrow Breeder Mash	10.6	20.0	21.2	4.0	3.7	50.9	5.3	8.0	8.3		
2	Larrow Breeder Mash	11.4	21.3	4.6	3.0	4.6	18.1	5.5	8.0	9.1		
1	Larrow 18% Broiler Feed	10.6	18.0	3.7	2.5	3.7	52.1	6.9	7.0	6.8		
1	Larrow Chick Builder	9.5	19.0	3.8	2.5	3.8	49.5	6.2	7.0	10.8		
2	Larrow 20% Dairy Feed	11.8	20.0	21.0	3.0	21.0	48.2	8.5	12.0	6.5		
7	Larrow 18% Dairy Feed	11.1	18.0	3.1	2.5	3.1	55.8	6.3	12.0	5.1		
1	Larrow 16% Dairy Feed	12.4	16.0	3.6	3.0	3.6	53.7	7.8	12.0	5.9		
5	Larrow 16% Dairy Feed	11.2	18.1	3.1	2.5	3.1	57.0	5.9	12.0	4.7		
6	Larrow Egg Mash	10.6	18.0	3.8	2.5	3.8	52.5	6.3	8.0	8.7		
1	Larrow Turkey Finisher	10.8	19.0	20.9	2.5	3.8	49.8	5.9	7.5	8.8		
Glidden Co., Feed Mill Division												
2	Glidden Broiler Ration	10.4	18.0	20.3	2.0	3.3	51.3	7.4	8.0	7.3		
1	Glidden Chick Starter	10.5	18.0	3.0	2.0	3.0	51.0	6.3	9.0	6.8		
4	Glidden 20% Dairy Feed	12.8	22.9	2.2	1.5	4.2	42.1	9.1	12.0	10.9		
2	Glidden Grain 14% Fitting Ration	13.2	21.0	2.0	2.0	2.2	46.1	7.1	14.0	9.7		
1	Glidden Growing Mash	10.6	17.0	3.3	2.0	3.3	51.4	6.2	9.0	7.4		
2	Glidden Laying Mash	10.7	20.6	3.1	2.0	3.1	51.6	7.1	9.0	6.9		
1	Glidden 18% Pig Meal	11.8	18.0	2.4	2.0	2.4	47.7	6.7	9.0	10.6		
1	Glidden Starter & Grower	9.9	17.0	3.0	2.0	3.0	52.5	8.2	9.0	7.8		
D. H. Grandin Milling Co												
2	Grandin's Growing Mash	11.4	16.0	3.4	3.0	3.4	55.4	6.7	8.0	6.9		
1	Grandin's Hi-Pro Pellets	9.7	20.0	3.0	3.0	3.0	44.8	7.3	8.0	11.2		
1	Grandin's Laying Mash	10.7	19.8	3.4	3.0	3.4	47.8	7.8	8.0	9.5		
3	Grandin's Laying Mash	10.9	18.0	3.1	3.0	3.1	52.7	7.1	8.0	8.2		
1	Grandin's 20 Milk Maker	11.2	20.0	4.3	4.0	4.3	47.5	9.4	10.0	7.0		
2	Grandin's 18 Milk Maker	11.3	18.0	3.1	3.5	3.1	52.5	9.4	10.0	6.2		
1	Grandin's Pig and Hog Ration	11.2	18.4	2.9	3.5	2.9	54.3	5.4	10.0	7.8		

1	Grandin's Special Stock Feed	12.5	10.5	10.0	3.2	3.0	58.3	9.2	12.0	6.3
5	Grandin's Start-to-Finish Mash	10.9	18.0	18.0	3.7	3.0	52.0	7.2	8.0	8.2
2	Grandin's Stock Feed	10.4	11.3	9.0	4.1	4.0	57.9	10.3	12.9	6.0
1	Grandin's 18 Test Cow Ration	11.9	18.0	18.0	4.1	4.0	49.5	9.6	9.0	6.8
3	Grandin's Turkey Grower	10.3	20.7	20.0	3.7	3.0	47.9	8.1	8.0	9.3
Griscom & Co., Inc.										
1	Golden Goose Broiler Mash Starter-Grower	11.2	20.9	18.0	3.2	3.0	53.2	5.8	7.5	5.7
2	Golden Goose Laying Mash	11.3	22.0	18.0	3.6	3.5	48.6	6.0	8.0	8.5
1	Grisco Molasses Horse Feed	15.8	17.3	9.0	3.2	2.5	55.9	8.5	10.0	5.3
2	Grisco Fitting Ration	13.0	17.6	14.0	3.6	3.0	51.3	6.7	8.0	7.8
2	Red Rooster Laying Mash	10.2	21.2	18.0	3.0	3.5	47.0	8.9	10.0	9.7
1	Spring Garden Pig & Hog Meal	11.6	16.7	14.0	2.4	2.5	49.0	9.8	11.0	10.5
Hales & Hunter Co.										
1	Havana Pellets	13.6	18.3	17.5	3.0	3.0	55.9	3.9	6.0	5.3
2	Pioneer 18 Dairy	13.4	19.6	18.0	3.8	3.0	50.0	6.2	9.0	7.0
2	Pioneer 14 Dairy Feed	13.0	18.5	14.0	3.8	3.5	51.6	6.5	9.0	6.6
1	Pioneer Pig & Hog Feed 20%	11.5	22.8	20.0	3.7	3.5	48.5	6.3	7.5	10.2
2	Red Comb Battery Feed Layer	11.7	17.3	16.0	3.4	3.5	53.3	5.3	6.0	9.0
2	Red Comb Breeder Mash Pellets	11.5	18.0	18.0	3.6	3.5	51.9	5.7	7.0	9.3
1	Red Comb Broiler Mash	11.3	18.2	18.0	3.1	3.5	57.2	4.5	7.0	5.7
1	Red Comb Egg Mash	11.2	20.3	18.0	2.9	3.5	52.1	4.6	7.0	8.9
1	Red Comb Egg Mash	12.7	19.4	20.0	3.5	3.0	50.6	5.5	7.0	8.3
1	Red Comb Flushing Mash	12.3	13.5	12.0	2.9	3.0	61.4	3.9	5.0	6.0
1	Red Comb Growing Mash	11.2	18.3	16.0	2.9	3.5	56.1	3.9	7.0	6.2
1	Red Comb Turkey Breeder	11.9	20.8	21.0	3.9	3.5	47.6	5.5	7.5	10.3
D. Harbeck & Sons										
1	Crusader All Purpose Mash	11.5	20.9	18.0	3.9	3.5	49.8	9.5	7.0	7.4
1	Welcome Dairy Feed	10.9	23.1	18.0	4.1	4.0	48.3	7.9	10.0	5.7
1	Welcome Growing Mash	11.6	21.9	16.0	4.3	4.0	49.5	5.9	7.0	6.8
1	Welcome Laying Mash	11.6	20.4	17.0	3.9	4.0	51.0	5.6	7.0	7.5
1	Welcome Starter and Broiler Mash	11.6	19.6	18.0	4.1	4.0	53.7	5.3	7.0	5.7
Harper Feed Mills, Inc.										
1	Harco 20% Dairy Ration	11.1	19.7	20.0	3.7	4.0	48.3	8.1	12.0	9.1
1	Harco Broiler Mash	10.3	22.6	20.0	4.3	3.0	45.6	8.0	7.0	9.2
1	Harco Growing Mash	11.9	20.2	18.0	4.3	3.0	52.1	5.8	8.0	5.7
1	Harco Laying Mash	11.3	20.1	20.0	4.0	3.5	50.5	5.9	7.0	8.2
1	Harco Starting Mash	10.5	22.8	18.0	5.4	3.0	44.2	7.0	8.0	10.1
E. C. & W. L. Hopkins, Inc.										
1	Granite State Chick Starter	11.3	19.0	20.0	3.4	4.0	51.1	5.9	9.0	9.3
1	Granite State Complete Growing Mash	10.9	17.2	17.0	3.4	4.0	54.0	6.6	7.0	7.3
1	Granite State Egg Mash	10.5	21.9	19.0	3.0	4.0	49.1	6.7	5.5	8.8
1	Granite State Growing Mash	10.2	22.7	19.0	3.9	4.0	47.6	6.3	6.0	9.3

1	Geo. Q. Moon & Co., Inc.	Moon's Complete Growing Mash	11.4	19.3	16.0	2.6	3.5	51.5	6.7	7.0	8.5
1		Moon's Complete Laying Mash—Pellets	11.5	16.1	17.0	3.0	3.5	56.5	5.7	7.0	7.2
1		Moon's Complete Laying Mash	12.3	18.8	17.0	4.0	3.0	48.8	7.4	7.0	8.7
3		Moon's 24% Dairy Ration	10.3	25.4	24.0	4.0	4.0	43.5	8.9	10.0	7.7
1		Moon's Hog Feed	12.9	13.0	13.0	3.9	3.0	53.5	6.4	8.0	5.0
1		Moon's 60 Molasses Horse Feed	13.0	15.0	9.0	2.6	3.0	57.3	7.8	10.0	4.3
1		Special A 20% Ration	11.1	23.6	20.0	5.1	3.0	44.5	9.1	10.0	6.6
3		Special A Dairy 18% Ration	10.7	19.8	18.0	3.8	4.0	50.7	7.7	10.0	7.3
3		Special A 16% Dairy Ration	10.2	21.1	16.0	3.9	3.0	49.2	7.0	10.0	7.7
2		Special A Laying Mash	11.5	19.0	18.0	3.3	3.0	50.4	7.0	9.0	8.8
New England Grain Co.											
1		New England Pig & Hog Ration	10.8	16.5	15.0	3.5	4.0	54.7	7.3	10.0	7.2
3		New England Sterling Laying Mash	11.8	18.1	18.0	4.6	4.0	52.3	5.9	8.0	7.3
2		New England Sterling Starter and Growing Feed	11.5	17.3	17.0	3.8	4.0	53.2	5.8	8.0	8.4
2		New England Sterling 16% Dairy Feed	11.8	17.8	16.0	4.3	3.5	51.7	9.2	11.0	5.2
Ogden Grain Co.											
3		"Biddy" Laying Mash	11.7	19.3	18.0	4.2	4.0	50.2	7.3	7.0	7.3
1		Gloverbloom 18% Dairy Feed	11.0	20.5	18.0	4.1	3.5	50.3	7.9	12.0	5.9
1		Pilgrim Growing Mash	10.3	22.1	18.0	4.5	4.0	50.3	6.6	8.0	6.2
1		Pilgrim Pig Feed	10.2	20.4	16.0	4.7	3.5	47.3	7.0	10.0	9.5
1		Pilgrim Starter-Grower-Layer	10.9	18.9	15.0	4.2	4.0	50.7	8.9	8.0	6.4
Omar, Inc.											
1		16% Dairy Ration	10.8	16.1	16.0	4.2	3.0	53.4	6.6	12.0	8.9
Park & Pollard Co.											
1		Bulky Sweet Dairy Feed	12.1	16.8	12.0	4.3	2.5	48.0	13.0	12.0	5.8
1		Doublex 24% Dairy Ration	11.9	23.7	24.0	4.0	3.0	45.5	8.0	11.0	6.9
1		Doublex 20% Dairy Ration	11.4	21.6	20.0	3.5	3.5	46.0	10.1	12.0	7.6
2		Doublex 18% Dairy Ration	11.2	19.6	18.0	3.5	3.5	51.1	7.3	12.0	7.3
1		Doublex 16% Dairy	12.4	17.4	16.0	3.2	3.5	54.1	6.0	12.0	5.9
2		Go-Tu-It Pig & Hog Ration	11.4	17.9	15.0	2.2	2.5	51.8	5.0	7.8	7.8
3		Lay or Best Dry Mash	10.2	19.8	18.0	3.6	3.0	47.9	9.0	7.0	11.6
1		Milk-Maid 24% Dairy Ration	11.8	24.7	24.0	3.7	3.0	44.9	8.0	10.0	6.9
2		Milk-Maid 20% Dairy Ration	11.9	21.8	20.0	3.5	3.5	50.0	6.8	10.0	6.0
3		Milk-Maid 18% Dairy Ration	11.0	19.9	18.0	3.1	3.5	52.8	7.2	10.0	6.0
3		Milk-Maid 16% Dairy Ration	11.6	19.3	16.0	3.2	3.5	53.4	6.9	10.0	5.6
1		Milk-Maid Test Cow Ration	11.7	20.7	18.0	4.1	4.0	49.0	8.1	9.0	6.4
3		Park & Pollard Fitting Ration	11.4	13.8	12.0	3.0	3.0	59.0	6.7	9.0	5.5
2		Park & Pollard Fitting Pellets	11.4	16.5	16.0	2.9	3.0	55.0	6.4	7.0	7.8
3		Park & Pollard Flething Feed	18.3	18.3	16.0	3.4	3.0	50.2	6.7	7.0	10.9
1		Park & Pollard Horse Feed	12.1	12.2	10.0	3.6	3.0	60.6	7.9	9.0	3.6
1		Park & Pollard Laying Pellets	10.7	18.9	18.0	3.2	3.0	54.3	7.2	7.0	5.7
1		Park & Pollard Laying Pellets	11.9	18.9	20.0	3.1	3.0	51.2	7.7	7.0	8.6
1		Park & Pollard Starter & Broiler Mash	11.1	19.3	18.0	3.4	3.0	50.3	7.7	7.0	5.2
2		Yankee Horse Feed	12.0	12.1	10.0	3.5	3.0	60.4	7.5	9.0	4.5

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num-ber of Analy-ses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract		Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
George H. Parker Grain Co.											
1	Parker's Egg Mash	11.4	18.3	18.0	4.1	5.0	53.8	7.0	5.8	7.0	6.6
1	Parker's Growing Mash	11.2	17.8	17.0	3.9	4.5	54.6	6.0	5.9	6.0	6.6
1	Parker's Starter and Broiler Mash	11.4	18.6	17.5	4.1	4.0	53.2	7.0	6.0	7.0	6.7
Quaker Oats Co.											
1	Ful-O-Pep Cali Starter-Pellets	9.3	20.1	20.0	5.2	4.5	51.5	8.0	7.7	8.0	6.2
1	Ful-O-Pep Crute Fattener	9.4	14.4	13.0	4.6	3.0	61.6	8.0	7.2	8.0	2.8
1	Ful-O-Pep 18% Dairy Ration	11.7	17.5	18.0	4.3	3.5	52.1	9.0	9.1	9.0	5.3
1	Ful-O-Pep Fitting Ration	11.4	15.0	14.0	4.2	3.5	55.2	10.0	8.1	10.0	9.1
3	Ful-O-Pep Horse Feed	12.3	11.9	12.0	4.2	3.0	57.2	10.0	8.9	10.0	5.5
1	Ful-O-Pep Laying Mash	8.9	20.7	20.0	4.8	3.5	48.7	8.0	8.0	8.0	8.9
1	Ful-O-Pep Pig-N-Sow Feed	8.9	17.1	16.0	4.9	3.5	54.0	8.0	8.0	8.0	7.1
1	Ful-O-Pep Super Greens	8.8	17.2	17.0	5.6	4.5	54.4	8.0	6.8	8.0	7.2
1	Ful-O-Pep Turkey Finisher Pellets	10.9	15.0	15.0	4.6	3.5	56.3	9.0	7.9	9.0	5.3
1	Ful-O-Pep Turkey Grower	10.0	20.2	20.0	4.1	3.5	50.1	14.0	11.2	14.0	4.9
1	Quaker 18% Protein Dairy Ration	10.9	18.4	18.0	4.5	2.5	35.5	15.0	13.2	15.0	7.6
1	Quaker 10% Dairy Ration	11.6	18.7	16.0	3.9	2.5	54.4	12.0	9.0	12.0	5.5
1	Quaker Green Cross Horse Feed	13.0	13.4	10.0	4.7	2.5	54.4	10.0	9.0	10.0	5.5
2	Quaker Sugared Schumacher Feed	11.1	11.3	10.0	2.9	3.0	59.4	12.0	10.3	12.0	5.0
Ralston Purina Co.											
1	Chowmix Hog Feed B	13.9	14.3	14.0	3.3	2.5	59.8	7.0	5.4	7.0	3.3
1	Ontario 18% Dairy Feed	10.9	21.6	18.0	3.2	3.0	46.7	15.0	10.8	15.0	6.8
1	Oswego Growing Feed	11.5	20.3	16.0	3.6	3.0	49.1	7.0	6.9	7.0	8.6
3	Purina Broiler Chow	10.4	24.2	18.0	4.2	3.5	48.3	7.0	6.2	7.0	6.7
2	Purina Cali Startena	12.7	21.4	19.5	3.1	2.5	49.4	9.5	7.4	9.5	6.0
1	Purina Chick Growena	11.6	18.9	17.0	3.5	3.0	54.0	7.0	5.2	7.0	6.8
3	Purina B & M Cow Chow	13.7	17.7	16.0	3.8	3.5	52.0	10.0	6.4	10.0	6.4

1	Purina Dry and Freshening Chow	13.7	14.0	12.5	4.1	2.0	51.4	8.7	14.0	8.1
1	Purina Eastern Cow Chow	11.6	20.7	20.0	4.8	3.0	47.6	8.7	12.0	6.0
1	Purina 18% Chow	12.9	19.9	18.0	3.9	3.0	49.8	6.9	12.0	6.6
3	Purina Dry and Freshening Chow	13.1	13.0	12.5	3.8	2.0	53.1	8.5	14.0	8.5
1	Purina Eggena	10.9	17.6	15.5	2.8	3.0	54.3	7.1	8.0	7.3
1	Purina Hog Fatena	12.3	16.6	14.0	2.9	3.0	57.0	6.1	7.0	5.1
1	Purina 22% Lay Chow	11.6	22.1	22.0	5.4	3.5	41.2	6.5	8.0	13.2
1	Purina 18% Lay Chow	11.0	19.6	18.0	3.6	3.0	47.7	7.8	8.0	10.3
4	Purina Layena Checkers	10.3	18.8	15.5	3.3	3.0	52.2	6.0	8.0	9.4
4	Purina Omoleone	14.2	11.4	10.0	3.8	3.0	58.2	8.1	11.0	4.3
2	Purina Turkey Growena	11.1	23.1	18.0	3.9	3.5	48.8	5.9	7.0	7.0
2	Purina Turkey Fatena Checkers	11.8	18.2	14.0	2.7	3.5	58.8	4.1	7.0	4.4
1	Purina Turkey Startena	11.0	25.9	24.0	4.8	4.0	43.9	5.0	7.0	9.4
3	Rex Grain & Milling Co., Inc. Rex Crown Horse Feed	13.9	12.1	10.0	3.2	3.0	59.3	5.9	9.0	5.6
1	D. F. Riley Riley's Laying Mash	11.9	20.8	20.0	3.9	4.5	51.1	5.5	6.0	6.8
2	Ryther & Warren Co. Blue Tag Dairy Ration	11.9	20.0	18.0	4.2	4.0	50.4	7.2	10.0	6.3
1	Minot Chick Mash	10.0	19.6	18.0	3.9	4.0	52.4	6.4	5.0	7.7
1	Minot Growing Mash	10.7	17.1	18.5	3.7	4.5	56.6	5.8	6.0	6.1
2	Minot Milk Egg Mash	11.4	17.9	17.0	3.6	4.5	52.1	5.7	7.0	9.3
1	Schultz, Baujan & Co. Critic All Mash Laying Ration	10.4	19.8	16.0	3.2	3.0	55.3	5.9	8.0	5.4
1	Critic Broiler Ration	11.5	20.5	19.0	3.3	3.0	52.0	6.3	7.5	6.4
1	Critic 40% Grain Horse & Mule Feed	13.1	12.2	8.0	3.4	5.0	53.5	10.0	16.0	7.8
1	Honest Egg Mash	11.2	20.7	18.0	4.5	3.0	50.1	6.4	7.5	7.1
1	Stratton & Co. 24 Stock Feed	10.6	9.0	6.0	3.1	2.5	63.4	10.8	15.0	3.1
4	Emergency Mixture Stratton's "24" Stock Feed	11.6	8.3	7.5	3.0	2.83	61.2	12.5	14.43	3.4
1	United Cooperative Farmers, Inc. United Farmers Breeder Mash	11.3	21.7	18.0	4.6	3.0	49.3	5.7	8.0	7.4
1	United Farmers Fitting Ration	11.5	13.8	12.0	4.1	3.0	57.7	6.8	9.0	6.1
1	United Farmers Grower	10.8	19.2	17.0	4.7	3.0	51.1	7.4	8.0	6.8
1	United Farmers Horse Feed	12.5	13.2	10.0	3.8	3.0	57.6	8.6	9.0	4.3
1	United Farmers Layer	10.8	18.5	18.0	4.6	3.0	51.7	6.4	8.0	8.0
1	United Farmers Milkmaker	12.0	16.6	18.0	3.9	3.5	56.2	6.0	9.0	5.3
1	United Farmers Starter	11.6	21.4	19.0	4.3	4.0	47.8	6.4	8.0	8.5

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num-ber of Anal-yses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Unity Feeds, Inc.										
2	Life Saver Mash	10.8	20.3	17.0	3.1	3.0	50.4	6.4	8.0	9.0
2	Paycheck 18% Dairy Ration	10.6	21.7	18.0	3.7	3.5	48.0	9.7	11.0	6.3
1	Unity 18% Dairy Ration	11.0	21.9	18.0	3.2	3.5	49.0	7.9	10.0	7.0
1	Unity Fitting Ration	12.2	16.1	15.5	3.5	3.5	54.7	6.9	7.0	6.6
1	Unity House Feed	12.5	14.0	10.0	3.6	3.0	56.3	8.3	9.0	5.3
1	Unity Pig & Hog Ration	10.5	21.9	17.0	3.5	3.5	46.1	8.2	8.0	9.8
Arthur Ventura Grain Co										
2	Eye-a-Day Dairy	10.2	22.5	22.0	4.0	4.5	48.1	7.3	7.0	7.9
2	Ventura Grower	10.2	20.3	16.0	3.4	4.0	46.4	6.2	6.0	13.5
2	Ventura Laying Mash	10.1	20.9	18.0	4.5	4.0	46.3	6.0	7.0	12.2
1	Ventura Starter	11.0	20.7	17.0	4.2	4.0	49.3	6.4	6.0	8.4
Vita-Vim Millers										
1	Speedy Egg Mash	11.2	19.8	17.75	3.2	3.0	49.0	7.0	8.95	9.8
1	Speedy Grower	11.1	19.6	17.25	3.5	3.0	50.5	6.4	8.85	8.9
1	Vita-Vim All Mash Breeder Mash	12.2	18.7	15.25	4.2	3.5	53.2	5.8	8.65	5.9
1	Vita-Vim Breeder 90	11.2	24.0	18.5	5.1	3.75	46.2	5.7	8.75	7.8
1	Vita-Vim Broiler Mash	11.7	19.9	18.0	3.6	3.5	52.2	5.8	7.85	6.8
1	Vita-Vim Cream-O-Fat 20% Dairy Ration	11.2	19.6	20.0	3.0	3.5	51.4	8.9	9.5	5.3
1	Vita-Vim Cream-O-Fat 18% Dairy Ration	11.7	19.4	18.0	4.1	3.5	50.0	8.7	9.5	6.1
1	Vita-Vim Cream-O-Fat 12% Fitting Ration	12.3	16.0	12.0	3.7	3.75	53.3	9.0	9.5	5.7
1	Vita-Vim Original Egg Control Laying Mash	11.4	19.8	18.0	4.2	3.0	49.1	6.7	8.75	8.8
1	Vita-Vim Original Starting and Growing Mash	11.5	20.3	18.0	4.1	3.5	49.7	6.3	7.95	8.1
1	Vita-Vim V-10 (Original) Mash	11.8	23.7	20.0	4.5	3.75	45.8	5.9	8.75	8.3
O. B. Vunck & Co.										
1	20% Cortland Dairy Ration	11.1	22.5	20.0	4.7	3.5	45.5	10.5	12.0	5.7
1	Cortland Laying Mash	10.3	20.6	18.0	5.4	4.0	48.4	6.8	7.0	8.5
1	Cortland Growing Mash	10.5	22.4	16.0	6.0	4.0	47.4	7.1	6.5	6.6
C. P. Washburn Co.										
1	Made Right Complete Broiler Ration	13.2	17.9	18.0	4.1	4.0	51.1	5.8	7.0	7.9
2	Made Right 16% Dairy	11.8	18.0	16.0	3.4	3.0	55.0	6.4	12.0	5.4
1	Made Right Fitting Ration	13.5	16.3	13.5	3.1	3.5	57.7	6.4	9.0	3.0

1	Made Right Horse Feed	14.4	10.3	8.0	3.2	3.0	65.1	4.9	7.0	2.1
1	Made Right Laying Mash	10.9	17.3	18.0	3.0	3.0	57.3	5.0	7.0	6.5
1	Made Right Laying Mash	12.3	19.3	20.0	3.8	3.5	49.7	6.2	7.0	8.7
1	Made Right Starting & Growing Feed	11.1	18.5	18.0	3.0	3.0	58.1	5.3	7.0	4.0
1	Made Right Starting & Growing Feed	12.3	20.0	20.0	4.1	3.0	49.3	0.7	7.0	7.6
1	Made Right Sweet Dairy Feed	10.8	19.9	20.0	4.2	4.0	53.3	7.5	8.0	4.3
Wayne County Grangers Feed Corp.										
1	Superior 20% Dairy Feed	12.8	20.3	20.0	4.0	4.0	49.3	8.2	10.0	5.4
1	Superior 18% Dairy Feed	12.3	18.3	18.0	3.6	3.5	55.8	5.8	10.0	4.2
1	Superior Growing Mash	10.3	18.5	18.0	3.9	3.5	56.0	6.9	7.5	4.4
1	Superior Horse Feed	12.4	13.9	10.0	3.5	3.0	56.9	8.8	9.0	4.5
1	Superior Laying Mash	11.1	18.9	18.0	4.1	3.5	54.8	6.9	7.5	4.2
1	Superior Turkey Grower & Fattener	11.4	20.4	20.0	3.6	4.0	51.0	8.5	7.0	5.1
H. K. Webster Co.										
4	Blue Seal All-Mash Egg Ration	12.0	16.9	15.0	3.4	4.0	56.5	5.9	5.5	5.3
3	Blue Seal All-Mash Growing Ration	11.5	17.0	14.5	3.1	3.5	57.2	5.7	6.0	5.5
2	Blue Seal Breeder's Mash	10.8	20.3	20.0	4.6	4.0	48.0	6.7	6.5	10.1
1	Blue Seal Broiler Mash	11.3	23.9	24.0	4.3	4.0	45.4	6.5	6.5	8.8
2	Blue Seal Calf Grower	11.9	13.9	12.0	3.6	3.0	55.0	4.9	5.0	4.9
2	Blue Seal Calf Starter with Vitamin D Yeast	12.8	18.7	18.0	4.0	4.0	54.8	4.8	4.8	4.9
1	Blue Seal Chick Starter	10.5	21.1	19.9	3.8	3.5	52.5	6.9	6.5	5.2
1	Blue Seal "20" Dairy Ration	11.4	19.1	20.0	5.0	4.0	51.3	7.9	9.0	5.3
3	Blue Seal "18" Dairy Ration	11.2	18.4	18.0	3.7	4.0	53.3	7.8	9.0	5.6
2	Blue Seal "16" Dairy Ration	11.3	16.8	16.0	3.8	4.0	54.6	7.8	9.0	5.7
3	Blue Seal Egg Mash	10.9	18.5	18.0	4.1	3.5	52.7	6.0	6.5	7.8
3	Blue Seal Fitting Ration with Vitamin D Yeast	12.0	14.4	14.0	3.9	4.0	56.1	7.9	9.0	5.7
4	Blue Seal Growing Mash	10.9	19.0	18.0	3.9	4.0	52.0	6.0	7.0	8.2
1	Blue Seal Horse Feed with Vitamin D Yeast	11.1	18.1	10.0	3.8	3.0	50.6	9.7	6.5	6.7
2	Blue Seal Pig Feed with Vitamin D Yeast	11.6	14.9	15.0	3.8	4.0	58.4	5.3	6.0	6.0
1	Blue Seal Richford 20 Dairy Ration	12.8	20.5	20.0	3.6	4.0	50.0	7.8	10.0	5.3
4	Blue Seal Richford 18 Dairy Ration	11.4	19.9	18.0	3.0	4.0	55.0	5.5	10.0	5.4
1	Blue Seal Richford 16 Dairy Ration	11.5	19.9	16.0	2.8	4.0	55.6	5.8	10.0	5.4
3	Blue Seal Stock Feed	11.3	13.0	8.5	3.0	3.0	60.0	7.7	17.0	5.0
5	Blue Seal Succulent Feed	12.7	14.9	10.0	3.3	1.5	51.0	11.0	18.0	7.1
1	Blue Seal Tonic Mash	11.1	16.2	15.0	3.7	3.5	57.5	5.4	5.5	6.1
4	Blue Seal Turkey Growing	10.5	22.0	20.0	3.9	4.0	49.3	6.5	6.5	7.8
Est. M. G. Williams										
2	Williams' Balanced Ration	11.9	18.6	18.0	3.9	4.0	50.0	6.7	10.0	8.9
2	Williams' Chick Starter	11.4	20.9	20.0	4.1	4.0	47.5	5.9	7.0	10.2
1	Williams' Growing Mash	10.6	17.9	15.0	3.5	4.0	54.2	6.0	7.0	7.8
1	Williams' Laying Mash	10.4	17.8	18.0	3.8	4.0	52.4	6.2	7.0	9.4

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Number of Analyses	Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
			Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
	Stanley Wood Grain Co.									
2	Bliss Dairy Ration	10.9	21.6	18.0	3.5	5.0	51.8	0.4	10.0	5.8
1	Preferred Complete Growing Ration	11.8	19.0	15.0	3.9	4.0	54.5	0.5	5.0	4.3
1	Preferred Complete Laying Ration	11.4	18.7	15.0	3.7	4.0	54.8	5.9	5.0	5.5
2	Preferred Growing Feed	12.2	17.7	17.5	3.9	4.5	54.3	5.0	7.0	6.9
1	Preferred Laying Mash	12.4	19.4	18.0	4.1	4.0	50.1	4.7	7.0	9.3
1	Preferred Laying Mash	11.5	19.9	20.0	4.6	4.5	51.3	4.5	7.0	8.2
1	Wood's Dairy Ration	11.3	19.9	20.0	3.9	4.0	53.8	6.6	10.0	4.5
1	Wood's Dairy Ration	10.0	17.8	16.0	3.9	5.0	55.9	8.8	10.0	3.6
	Worcester Grain & Coal Co.									
1	Just-Right Laying Mash	10.1	21.4	18.0	4.1	4.0	45.7	7.9	7.0	10.8
1	Just-Right Dairy Ration 20%	10.5	23.3	20.0	4.8	3.5	45.3	9.5	9.0	6.6

Alfalfa Products

Alfalfa meals which are used as a source of carotene in poultry mashes should contain at least 50,000 International Units of carotene per pound in terms of vitamin A equivalent. In 1942 when Control Service made the first assays, 59 per cent of those examined met this standard; in 1945, only 32 per cent proved satisfactory.

Rapid deterioration of carotene can be caused in a number of ways, even though the unprocessed material is of excellent quality. For most of these the manufacturer is not responsible, although overheating in dehydration and grinding may cause considerable loss at the mill. This can be prevented to some extent by subsequent rapid cooling.

The data presented indicate that more care should be exercised in the purchase and subsequent holding of alfalfa prior to its use in feeds. Purchasing shipments far in advance of requirements and holding for long periods of time under the usual storehouse conditions is conducive to rapid deterioration.

Alfalfa Products

Manufacturer and Brand	Sampled at	Date of Arrival	Date of Sampling	Protein		Fiber		Ash %	Vitamin A from Carotene International Units per Pound
				Found %	Guar-anteed %	Found %	Guar-anteed %		
Fremont Molasses Feed Co., Fremont, Neb. Alfalfa Meal and Molasses	Farmers' Cooperative Exchange, Frammingham Ctr.	—	2- 1-1945	13.9	9	16.9	30	15.9	7.938
Keystone Dehydrating Co., Nazareth, Penn. Keystone Super-Green Dehydrated Alfalfa Meal Keystone Super-Green Dehydrated Alfalfa Meal Keystone Super-Green Dehydrated Alfalfa Meal Keystone Super-Green Dehydrated Alfalfa Meal Keystone Super-Green Dehydrated Alfalfa Meal Keystone Super-Green Dehydrated Alfalfa Meal	D. Harbeck & Son., New Bedford M. G. Williams Est., Taunton Borden Grain Co., Taunton Conroy Grain Co., Taunton M. G. Williams Est., Taunton Conroy Grain Co., Taunton	10-28-1944 6- 7-1944 8- 2-1944 7- 1-1944 6-12-1944 8-30-1944	1-24-1945 9- 6-1944 9- 7-1944 9-26-1944 1-10-1945 1-26-1945	14.8 17.1 15.7 17.0 17.3 17.0	17 17 17 17 17 17	29.9 27.6 28.3 24.2 26.1 26.9	30 30 30 30 30 30	6.3 6.5 5.8 9.8 7.9 7.1	37,800 56,624 67,284 96,768 34,020 51,030
Meyer Milling Co., Lexington, Neb. Dehydrated Alfalfa Meal	Ellison Coal & Grain Co., Haverhill	—	1- 3-1945	15.5	17	29.7	28	8.9	47,250
Pecos Valley Alfalfa Mill Co., Chandler, Ariz. Alfalfa Meal	Eastern Grain Co., Bridgewater	—	1- 9-1945	11.9	13	34.7	33	8.2	16,632
Rafferty & O'Rourke, Wyatt, Mo. R & O's 20% Dehydrated Alfalfa Leaf Meal	Cover Grain & Feed Co., Lowell	7- 1944	9-22-1944	23.2	20	17.8	18	9.4	105,084
Saunders Mills, Inc., Toledo, Ohio Vita-Greens Alfalfa Meal 17 17% Alfalfa Meal, Dehydrated Vita-Greens Alfalfa Meal 15 Alfalfa Meal Xtra Fine 13	General Mills, Inc., Middleboro C. P. Washburn Co., Middleboro Mansfield Milling Co., Mansfield General Mills, Inc., Ayer	11- 3-1944 12- 1944 3- 9-1944 10-17-1944	1-10-1945 1-10-1945 9- 5-1944 10-17-1944	15.4 16.5 16.4 10.5	17 17 15 13	26.9 31.5 27.8 35.0	30 30 32 33	10.0 10.5 7.2 6.2	51,030 22,302 12,852 5,896
*Cooperative Alfalfa Mills, Inc., Toledo, Ohio Vita-Greens Alfalfa Meal 17	General Mills, Inc., Middleboro	7-26-1944	9- 8-1944	17.1	17	24.7	30	7.2	61,085
*Mississippi Valley Dehydrating Assoc., Tiptonville, Tenn. Vita-Greens Alfalfa Meal 17 Vita-Greens Alfalfa Meal 17	C. P. Washburn Co., Middleboro Frank Diauto, Randolph	9- 6-1944 9- 1-1944	9- 8-1944 10-24-1944	16.7 17.3	17 17	29.4 31.5	30 30	8.1 8.9	92,988 27,594
Schoenck Farms, Inc., Nazareth, Penn. Super-Green Dehydrated Alfalfa Meal Super-Green Dehydrated Alfalfa Meal Super-Green Dehydrated Alfalfa Meal	Stanley Wood Grain Co., Taunton United Cooperative Farmers, Inc., Fitchburg	9-25-1944 8- 1944	9-29-1944 10- 6-1944	19.3 19.7	17 17	25.6 25.2	25 25	7.3 7.4	36,288 36,288
Super-Green Dehydrated Alfalfa Meal Super-Green Dehydrated Alfalfa Meal Super-Green Dehydrated Alfalfa Meal	George H. Parker Grain Co., Danvers George A. Fair, Holliston C. P. Washburn Co., Middleboro	8- 1-1944 3- 1944 —	10- 5-1944 10-11-1944 1-10-1945	17.9 20.1 18.3	17 17 17	27.6 26.0 24.9	25 25 25	8.6 9.8 10.0	34,776 12,852 31,147

Ground Oats

The variation from normal in the ground oat samples analyzed indicates in general the use of a No. 3 or No. 4 oat, and sometimes an even lower grade. The fat content of barley is much lower than that of oats, consequently the presence of barley in any considerable amount will lower the fat content of the mixture. Normal oats contain between 4 and 5 per cent of fat, a figure seldom reached in the ground oats found on the market. Sixteen and one-half per cent of protein in the Delaware Mills sample could indicate the addition of cereal by-products of higher protein content than that carried by the cereals themselves.

Of especial interest are the samples manufactured by the Northwest Distributing Co., the Flambeau Milling Co., and two unidentified samples sent by the Northampton State Hospital. All of these samples carried an ash content much in excess of normal. Analysis of several of these samples indicated the presence of lime or calcium carbonate. One sample from the Flambeau Milling Co. had a calcium content equivalent to 5.5 per cent calcium carbonate; another, 5.8 per cent; a sample from the Northwest Distributing Co., a calcium carbonate content of 2.4 per cent. An unidentified sample from the Northampton State Hospital contained calcium equivalent to 4.29 per cent calcium carbonate. A microscopic examination of the sample showed it to contain ground oats, wheat, and barley, together with a large amount of oat hulls, stems, and weed seeds. It could be considered as nothing more than oat screenings.

These inferior samples were collected when freight embargoes were in force. Any kind of feed was welcome and prosecution was not attempted. The information has been filed for further reference should their sale continue.

Ground Oats

Manufacturer	Sampled at	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash	
		%	%	%	%	%	%	%	%	%	%	%	%
Allied Mills, Inc., Chicago, Ill.	Sunshine Feed Store, Greenfield	11.3	12.4	3.7	58.8	10.6	3.2						
Dailey Mills, Inc., Binghamton, N. Y.	Squier & Co., Monson	12.1	12.9	3.9	59.8	8.6	2.7						
Delaware Mills, Inc., Deposit, N. Y.	Seder & Gruber, Maynard	11.7	16.3	3.9	57.2	7.3	3.6						
Doughboy Mills, Inc., New Richmond, Wis.	Ryther & Warren Co., Belchertown	10.6	11.7	3.1	60.3	10.9	3.4						
Eastern States Farmers' Exchange, West Springfield	Eastern States Farmers' Exchange, Shelburne Falls	11.3	11.9	4.1	58.9	10.7	3.1						
Flambeau Milling Co., Phillips, Wis.	Essex County Co-operative Farming Assoc., Topsfield	11.4	11.3	3.4	57.1	9.1	7.7						
Flambeau Milling Co., Phillips, Wis.	Arthur Ventura Grain Co., Taunton	11.5	11.2	2.9	53.8	11.3	9.3						
Flambeau Milling Co., Phillips, Wis.	Courcy Grain Co., Taunton	11.4	11.4	3.8	52.5	11.0	9.9						
D. Harbeck & Sons, New Bedford	D. Harbeck & Sons, New Bedford	12.2	12.0	3.8	59.1	9.8	3.1						
National Oats Co., Cedar Rapids, Iowa	Arthur Ventura Grain Co., Taunton	8.5	12.5	4.6	55.9	14.3	4.2						
Northwest Dist. Co., Inc., Abbottsford, Wis.	General Mills, Inc., Middleboro	10.9	12.5	3.4	56.7	9.9	6.6						
Northwest Dist. Co., Inc., Abbottsford, Wis.	General Mills, Inc., Middleboro	9.8	11.7	3.5	59.0	9.5	6.5						
Purity Oats Co., Keokuk, Iowa	Ryther & Warren Co., Belchertown	9.1	13.4	3.5	60.3	10.0	3.7						
St. Cloud Milling Co., St. Cloud, Minn.	W. N. Potter Grain Stores, Inc., Huntington	9.7	12.2	3.9	60.2	10.3	3.7						
Stratton & Co., Concord, N. H.	Bay State Coal & Grain Co., Billerica	12.6	12.7	2.9	59.7	8.9	3.2						
H. K. Webster Co., Lawrence	H. K. Webster Co., Lawrence	11.3	12.0	3.7	59.5	10.3	3.2						
Unknown	Northampton State Hospital	9.4	12.0	3.3	52.8	11.4	11.1						
Unknown	Northampton State Hospital	8.3	12.3	3.6	59.0	9.7	7.1						
Average for 960 samples, Morrison — Feeds and Feeding		8.9	12.0	4.7	60.2	10.6	3.6						

Riboflavin Supplements

(Many of which contain other vitamin or nutritive qualities for which an examination was not made)

(John W. Kuzmeski)

Manufacturer and Brand	Riboflavin Parts per Million
Borden Co., Special Products Div., New York, N. Y.	
Flaydry Poultry Feed Supplement	19.6
Flaydry Poultry Feed Supplement	61.2
Ladpro Poultry Feed Supplement	54.0
Ladpro Poultry Feed Supplement	67.0
Center Milk Products Co., Middlebury, Ctr., Penn.	
Vita-Brand Dried Buttermilk	32.4
Commercial Solvents Corp., Peoria, Ill.	
B 43 Riboflavin Supplement	320.0
Dawes Manufacturing Co., Peoria, Ill.	
Dawes Vitamelk Base	51.2
Dawes Vitamelk Base	47.7
Getek Industrial & Agricultural Supplies Corp., New York, N. Y.	
Getek Dried Distillers Solubles	18.0
Getek Dried Distillers Solubles	11.0
Getek Dried Distillers Solubles "M"	10.8
Getek Dried Distillers Solubles "M"	12.9
Milktone Concentrate Co., Baltimore, Md.	
Dia-Gen	29.6
National Distillers Products Corp., New York, N. Y.	
Produlac with Solubles	18.6
Produlac Wheat Distillers Grains with Solubles	13.5
Western Condensing Co., San Francisco, Cal.	
Peebles Lacto-G Dried Whey	30.5
Peebles Lacto-G Dried Whey	23.1
Peebles Lacto-G Dried Whey	33.6
Peebles Lacto-G Dried Whey	34.9
Peebles Whey Solids	22.8
Whitmoyer Laboratories, Inc., Myerslown, Penn.	
Brewers Blended Dried Yeast	52.5

Carotene and Riboflavin Content of Commercial Poultry Feeds
(John W. Kuzmeski and Albert F. Spelman)

Manufacturer and Brand	*Vitamin A from Plant Sources only per pound of total feed International Units	Vitamin G (Riboflavin) per pound of total feed Gammias or Micrograms
Allied Mills, Inc.		
Economy Laying Mash with Fortified Sardine Oil	605	1,769
Wayne Growing Mash with Fortified Sardine Oil	1,211	1,814
Barber & Bennett, Inc.		
Fort Orange Laying Mash	2,419	1,542
Beacon Milling Co., Inc.		
Beacon Breeders Mash	5,296	2,132
Beacon "22" Egg Mash	3,704	1,633
Beacon Emergency Broiler Feed	2,948	2,132
Beacon Fleshing Pellets	1,361	1,950
Borden Grain Co.		
Borden's Laying Mash	1,739	1,542
Courcy Grain Co.		
Courcy's Eastern Milk Laying Mash	1,890	1,814
Chas. M. Cox Co.		
Wirthmore Breeder Mash Pellets	2,646	2,585
Wirthmore Complete Egg Ration	1,890	1,724
Wirthmore Starter & Broiler Ration	3,402	1,769
Dailey Mills, Inc.		
Dailey's Egg Producer Mash	3,175	1,633
Dailey's Super Laying Mash	5,443	1,769
F. Diehl & Son, Inc.		
Diehl's Dry Mash	983	1,588
Dietrich & Gambrell, Inc.		
D & G All Mash Layer	2,419	1,814
Eastern States Farmers' Exchange		
Eastern States All-Mash Egg Pellets	1,512	2,631
Eastern States Developer	3,780	2,177
Eastern States Turkey-Grower	3,402	2,769
Elmore Milling Co., Inc.		
Elmore Egg Mash	3,478	1,361
Elmore Growing Mash	3,326	1,769
Flory Milling Co., Inc.		
Flory Laying Mash	1,210	1,860
Flory Starter Mash	1,210	1,633
Fred A. Fountain		
Fountain's Starting and Broiler Mash	983	1,724
J. B. Garland & Son, Inc.		
Garland Complete Starting and Broiler Mash	3,251	1,769
Garland Laying Mash with Cod Liver Oil	1,588	1,497
General Mills, Inc., Larrowe Division		
Larro Egg Mash	1,361	1,769
Glidden Co., Feed Mill Division		
Glidden Breeder Mash	2,797	1,678
Glidden Laying Mash	3,553	1,769
D. H. Grandin Milling Co.		
Grandin's Laying Mash	832	1,633
Grandin's Starter & Broiler Ration	2,797	2,449
Hales & Hunter Co.		
Red Comb Chick Starter	4,007	1,950
D. Harbeck & Sons		
Crusader All Purpose Mash	832	1,950
Welcome Egg Mash	1,436	1,814
Welcome Starter and Broiler Ration	1,436	1,588
Harper Feed Mills, Inc.		
Harco Broiler Mash	983	1,905
Harco Starting Mash	1,210	2,268

*Vitamin A from fish oils and materials other than plant sources not determined.

Carotene and Riboflavin Content of Commercial Poultry Feeds—Continued

Manufacturer and Brand	*Vitamin A from Plant Sources only per pound of total feed International Units	Vitamin G (Riboflavin) per pound of total feed Gammas or Micrograms
Mackenzie & Winslow Inc.		
Turkey Fat	378	1,860
Turkey Growing	1,663	1,905
Turkey Starter	832	2,495
Mansfield Milling Co.		
Mansfield Chick-Growing Mash	832	1,466
Mansfield Dry Poultry Mash	832	1,905
Ralston Purina Co.		
Purina Broiler Chow	3,100	2,177
Purina Chick Growing Chow	1,285	2,404
Purina Turkey Growena	605	2,313
Ryther & Warren Co.		
Minot Chick Mash	2,100	1,678
Minot Growing Mash	454	1,588
Arthur Ventura Grain Co.		
Ventura Laying Mash	983	1,451
Ventura Starter	1,512	1,497
C. P. Washburn Co.		
Made Right Starting & Growing Feed	756	1,814
Wayne County Grangers Feed Corp.		
Superior Laying Mash	529	1,588
H. K. Webster Co.		
Blue Seal All-Mash Egg Ration	2,344	1,724
Blue Seal Breeder's Mash	4,763	1,769
Blue Seal Broiler Mash	4,234	2,676
Blue Seal Turkey Growing Pellets	2,419	1,588
Stanley Wood Grain Co.		
Preferred Laying Mash	680	1,542

*Vitamin A from fish oils and materials other than plant sources not determined.

The preceding table contains the determined content of carotene and riboflavin in commercial mashes found in Massachusetts markets. The list is in no way complete and simply represents such samples as were picked up by Control Service inspectors and were available at the time the work was undertaken.

Carotene is an organic substance from which vitamin A can be formed by biological processes. One part of carotene is equivalent to 1.6 parts of vitamin A. The principal source of carotene in commercial mashes is alfalfa meal, which varies widely in carotene content. It is believed that some feed mixers use very little care in the selection of alfalfa.

It should be understood that the assays here reported are for carotene and that low results do not necessarily indicate a vitamin A deficiency as dependence may have been placed on other sources for a part of the vitamin A. All of the feeds examined declared cod liver or other fish oils as an ingredient, both of which contain vitamin A.

Titus, in an article published in the 1939 edition of the United States Department of Agriculture Year Book, suggests that if a feed is to be stored for more than a month not less than 70 per cent of the vitamin A should be derived from plant sources, the reason being that vitamin A in oil carriers when incorporated in a mixed feed is much more unstable than carotene derived from such plant sources as alfalfa and corn. Carotene in alfalfa is also unstable when the alfalfa is not produced and stored in such a way as to conserve the carotene.

The assays for riboflavin (vitamin G) indicate that furnishing a sufficiency of this vitamin is not a serious problem. Its principal sources are distillers' residues or by-products, dried yeast, dried milk and milk by-products, alfalfa meals, and numerous commercial blends which depend upon some of the above listed as a riboflavin ingredient. Riboflavin is more stable than either carotene or vitamin A.

Following is a compilation of vitamin A and riboflavin requirements for poultry taken from the 1939 United States Department of Agriculture Year Book, found in the article "Practical nutritive requirements of poultry" by Harry W. Titus.

Class	*Vitamin A per pound of total feed International Units	Vitamin G (Riboflavin) per pound of total feed Gammas or Micrograms
Chickens		
Growing chicks	1450	1670
Laying stock	3150	680
Breeding stock	4720	1250
Turkeys		
Growing poults	3630	1670
Breeding stock	4720	1250

*If the feed is to be stored for more than a month before it is fed, not less than 70 per cent of the vitamin A should be derived from plant sources.

For the benefit of feed chemists who may be interested the methods used in determining carotene and riboflavin follow.

Methods Used for Determination of Carotene and Riboflavin in Mixed Feeds**Carotene**

A 5 gram sample was refluxed for one-half hour with 50 ml of freshly prepared alcoholic KOH (50 g in 200 ml alcohol) and 5 grams anhydrous Na_2SO_4 . The solution was cooled to room temperature and decanted into a 500 ml separatory funnel. The residue was extracted by shaking and decanting with at least 3 portions of 35 ml of Skelly-solve B until extracts were colorless. The extracts were combined with the alcoholic KOH extract and washed with 90% methanol, shaking thoroughly after each addition, until washings were colorless. The Skelly-solve was then washed with water until free of KOH and filtered through anhydrous Na_2SO_4 . The filtrate was passed through an adsorbent column of activated magnesium oxide and Hyflo Super-Cel according to the method of Wall and Kelley, *Ind. & Eng. Chem., Anal. Ed.*, 15, 18 (1943). The eluate was diluted to a convenient volume and the carotene content determined by measuring its per cent transmittance in a spectrophotometer.

Riboflavin

The method used is a modification of the Hodson and Norris method for the fluorometric determination of riboflavin.

A 5 gram sample was weighed into a 250 ml amber extraction flask, 50 ml of 0.25 N H_2SO_4 were added and the mixture was refluxed for one hour. After cooling, the pH of the mixture was adjusted to 6.8 with $\text{Na}_3\text{PO}_4 \cdot 12 \text{H}_2\text{O}$ (6% solution) using a glass electrode, diluted to a volume of 200 ml and mixed thoroughly. The precipitate formed was allowed to settle for at least one-half hour. A 50 ml aliquot was taken from the more or less clear supernatant layer and 2 ml of 4% KMnO_4 were added while swirling the solution. After about 4 minutes 0.2 gram of solid $\text{Na}_2\text{S}_2\text{O}_4$ and 2 ml of dilute SnCl_2 (1 ml of 4% SnCl_2 in HCl diluted to 250 ml) were added and the solution was mixed thoroughly. 5 ml of acetone were then added if necessary to reduce foaming and solution made to volume of 200 ml with water, mixed and allowed to stand at least 10 minutes. The solution was filtered through No. 41 Whatman filter paper into a 1000 ml amber Erlenmeyer flask until filtrate measured about 100 ml. The unstoppered flask and contents were placed in a shaking machine and shaken for 10 minutes. A 25 ml aliquot was pipetted into a small Erlenmeyer flask (solution A) and the remaining solution was divided into two approximately equal portions (solutions B and C). To solution A, 1 ml of a standard riboflavin solution containing .002 mg riboflavin per ml was added and the solution was well mixed. To solution C, 0.1 gram of solid $\text{Na}_2\text{S}_2\text{O}_4$ was added. 10 ml portions of each solution were pipetted into 3 matched cuvettes and the fluorescence of each solution was measured. The calculation involved, using the weight of sample and dilutions given here, is:

$$\frac{64 (B - C)}{5.2 (A - B)} = \text{p.p.m. riboflavin}$$

What is Scratch Feed?

Just what grains should be used in the making of an ideal scratch feed or in what proportions they should be present is a matter of diverse opinion. Shortages of certain cereals, principally corn, and a plentiful supply of wheat have made wheat the preponderant cereal grain in scratch feeds during the past season.

With a view to determining the ingredient content of scratch feeds sold, 19 samples officially collected were divided into their component grains. The results indicate that the samples were on the whole as represented. The following exceptions were noted: one sample contained inferior oats instead of No. 2 oats as declared; two samples which declared buckwheat as an ingredient contained none; oats were found to be present in one sample where none were declared; and sunflower seed declared in another was not present. The scarcity and high price of sunflower seed should make its absence obvious. One sample contained whole Argentine corn instead of the usual cracked corn.

The mixing and sampling of scratch feeds present difficulties not common to finely ground meals. Even with the most careful mixing the seeds of different sizes and shapes tend to segregate. While this is not usually apparent to the eye, it does make considerable difference when an attempt is made to determine accurately the percentage by weight of the grains used in the mixture. Two test mixes made in the laboratory of wheat, cracked corn, and oats gave results probably closer to the true content than could be expected of a commercial mix. The first contained by weight: wheat 60%, cracked corn 10%, oats 30%. Actually recovered was: wheat 59.5%, corn 10.6%, oats 29.9%. Of the second mix consisting of wheat 20%, cracked corn 60%, oats 20%, the recovery was wheat 20.4%, cracked corn 66.4%, oats 19.2%. It is believed that the results obtained for the commercial mixtures are at least approximate if not accurate.

The results are reported by number instead of by brand name as, with the fluctuating kinds and amounts of grain available, it is often necessary for the manufacturer to modify his formulas. With a return to normal conditions brands may be expected to be more uniform.

No.	Barley Per Cent	Buckwheat Per Cent	Cracked Corn Per Cent	Kaffir & Milo Per Cent	Oats Per Cent	Wheat Per Cent
1	21	—	66	1	—	12
2	—	—	6	—	33	61
3	9	—	16	2	8	65
4	5	3	9	3	28	52
5	11	—	15	9	8	57
6	3	—	26	9	9	53
7	3	—	28	8	9	52
8	21	—	19	3	—	57
9	14	—	11	3	—	72
10	21	3	11	—	8	57
11	15	10	17	—	—	58
12	4	—	24	—	9	63
13	12	9	33	—	—	46
14	15	—	35	—	—	50
15	5	—	46	—	7	42
16	10	—	52	5	—	33
17	—	—	43	—	8	49
18	—	—	58	—	4	38
19	5	—	44	—	8	43

**Directory of Manufacturers Who Registered Feeding Stuffs for Sale
in Massachusetts in 1945**

- Ward G. Ackerman, Altamont, N. Y.
 Albers Milling Co., Seattle, Wash.
 Allied Mills, Inc., Chicago, Ill.
 American Maize-Products Co., 100 East 42nd St., New York, N. Y.
 A. P. Ames & Co., 10 Walnut St., Peabody, Mass.
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.
 Archer-Daniels-Midland Co., Minneapolis 2, Minn.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
 Atlantic Supply Co., Duncannon, Penn.
 E. W. Bailey & Co., Montpelier, Vt.
 Balfour, Guthrie & Co., Ltd., 1907 Elm St., Dallas 1, Texas
 Barber & Bennett, Inc., Albany, N. Y.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Foods, Inc., 237 Main St., Buffalo, N. Y.
 Bisbee Linseed Co., Inc., Amsterdam, N. Y.
 Bisbee Linseed Co., 2100 Lincoln-Liberty Bldg., Philadelphia, Penn.
 Blatchford Calf Meal Co., Waukegan, Ill.
 Blatchley & Ballard, Inc., Middletown, Conn.
 Bluepoints Co., Inc., Aberjona Packing Division, Woburn, Mass.
 Borden Co., Special Products Div., 350 Madison Ave., New York, N. Y.
 Borden Grain Co., West Water St., Taunton, Mass.
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Co. of North America)
 George B. Brown Corp., Ipswich, Mass.
 Buckeye Cotton Oil Co., Cincinnati, Ohio
 A. B. Caple Co., Toledo 5, Ohio
 Center Milk Products Co., Middlebury Center, Penn.
 Central Soya Co., Inc., Fort Wayne 2, Ind.
 Cerophyl Laboratories, Inc., 2438 Broadway, Kansas City, Mo.
 Checkerboard Feed Stores, Ralston Purina Co., Prop., St. Louis 2, Mo.
 Coatsworth and Cooper Ltd., 67 Yonge St., Toronto, Ont., Canada
 Commander-Larabee Milling Co., Minneapolis, Minn.
 Community Service, Inc., Canaan, Conn.
 Consolidated Products Co., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Continental Distilling Corp., 1429 Walnut St., Philadelphia 2, Penn.
 O. A. Cooper Co., Humboldt, Neb.
 Cooperative Alfalfa Mills, Inc., Box 1525, Central Station, Toledo, Ohio
 Corn Products Sales Co., 17 Battery Place, New York, N. Y.
 Courcy Grain Co., 12 Waverly St., Taunton, Mass.
 Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston 9, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
 Crookston Milling Co., Crookston, Minn.
 Dailey Mills, Inc., Olean, N. Y.
 Dairymen's League Cooperative Association, Inc., 111 West 42nd St., New York 18, N. Y.
 Decatur Milling Co., Inc., Decatur, Ill.
 Dehydrated Alfalfa Mills, Inc., 247 East Washington St., Fremont, Neb.
 Dehydrating Process Co., 60 Mt. Washington Ave., Boston, Mass.
 Delaware Mills, Inc., 88 Front St., Deposit, N. Y.
 Denver Alfalfa Milling & Products Co., Lamar, Col.
 Frank Diauto, 87 Warren St., Randolph, Mass.
 F. Diehl & Son, Inc., Wellesley 81, Mass.
 Dietrich & Gambrell, Inc., Frederick, Md.
 Drackett Products Co., Cincinnati, Ohio
 E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.
 Eagle Roller Mill Co., New Ulm., Minn.
 Eastern States Farmers' Exchange, West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 Economy Grocery Stores Corp., 393 D St., Boston, Mass.
 Egg-O-Milk Co., Baltimore, Md. (Registered by P. Fred'k Obrecht & Son)
 M. W. Ellis Estate, 19 Walnut St., Peabody, Mass.
 Elmore Milling Co., Inc., Oneonta, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Assoc., Topsfield, Mass.

- Evans Milling Co., Indianapolis, Ind.
Excelsior Milling Co., Minneapolis 15, Minn.
Fair Grain Co., Holliston, Mass.
Farm Industries, Inc., DeGraff, Ohio
Farmers Feed Co., 532 East 76th St., New York, N. Y.
Federal Mill, Inc., Lockport, N. Y.
Ferneau Grain Co., Blanchester, Ohio
Finger Lakes and Hudson Flour Mills, Inc., Geneva, N. Y.
Finger Lakes & Hudson Flour Mills, Inc., 7 Madison St., Troy, N. Y.
First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
Flory Milling Co., Inc., Bangor, Penn.
Fried A. Fountain, Taunton, Mass.
Fremont Molasses Feed Co., Fremont, Neb.
J. B. Garland & Son, Inc., Worcester, Mass.
Gateway Milling Assoc., Inc., Buffalo 13, N. Y.
General Foods Corp., Battle Creek, Mich.
General Foods Corp., Corn Mill Division, Kankakee, Ill.
General Mills, Inc., Minneapolis, Minn.
General Mills, Inc., Farm Service Division, Fitchburg, Mass.
General Mills, Inc., Larrowe Division, Detroit 2, Mich.
Gerard Milk Products Co., Baltimore 5, Md.
Getek Industrial & Agricultural Supplies Corp., 1270 Sixth Ave., New York 20, N. Y.
W. K. Gilmore & Sons, Inc., Walpole, Mass.
Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis, Ind.
Glidden Co., Soya Products Division, 5165 West Moffat St., Chicago 39, Ill.
Gloucester Dehydrating Process Co., Gloucester, Mass.
Gorton-Few Fisheries Co., Ltd., 327 Main St., Gloucester, Mass.
D. H. Grandin Milling Co., Jamestown, N. Y.
Great Atlantic & Pacific Tea Co., New York, N. Y.
Griscom & Co., Inc., 20 Broadway, New York 6, N. Y.
Hales & Hunter Co., 166 West Jackson Blvd., Chicago, Ill.
D. Harbeck & Sons, New Bedford, Mass.
Henkel Flour Mills, Division of International Milling Co., 323 East Atwater St., Detroit 26, Mich.
Hercules Powder Co., Dairy Products Division, 332 South Michigan Ave., Chicago, Ill.
Hood Mills Co., 4101 East Monument St., Baltimore 5, Md.
E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
Hubinger Co., Keokuk, Iowa
Humphreys-Godwin Co., Memphis 3, Tenn.
Illinois Cereal Mills, Inc., Paris, Ill.
Independent Talow Co., Inc., 39 Cedar St., Woburn, Mass.
International Milling Co., Minneapolis 1, Minn.
Kellogg Co., Battle Creek, Mich.
Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
Keystone Dehydrating Co., Nazareth, Penn.
H. H. King Flour Mills Co., Minneapolis, Minn.
Kinsey Distilling Corp., 1429 Walnut St., Philadelphia 2, Penn.
Kraft Cheese Co., 500 Peshtigo Court, Chicago 90, Ill.
Chas. A. Krause Milling Co., Milwaukee 1, Wis.
Larahee Flour Mills Co., Kansas City, Mo.
L. B. Lovitt & Co., Memphis, Tenn.
Mackenzie & Winslow, Inc., Fall River, Mass.
Maine Fish Meal Co., Union Wharf, Portland, Maine
Mansfield Milling Co., Mansfield, Mass.
Maritime Milling Co., Inc., Buffalo, N. Y.
Meadow Brook Farms, Nazareth, Penn.
Mellin's Food Co. of North America, 41 Central Wharf, Boston, Mass. (Registered for A. H. Brown & Bros.)
Merrimack Farmers' Exchange, Inc., Concord, N. H.
Middlesex County Farm Bureau Assoc., 155 Lexington St., Waltham, Mass.
Milkstone Concentrate Co., 1327 Baltimore Trust Bldg., Baltimore 5, Md.
Miner-Hillard Milling Co., Wilkes-Barre, Penn.
Mississippi Valley Dehydrating Assoc., Inc., Box 1525 Central Station, Toledo, Ohio
Geo. Q. Moon & Co., Inc., Binghamton, N. Y.
Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.
National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.
National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
National Lead Co., 111 Broadway, New York 6, N. Y.

National Milling Branch of National Biscuit Co., 2221 Front St., Toledo, Ohio
New Bedford Grain Co., New Bedford, Mass.
New England Grain Co., 390 Commercial St., Portland, Maine.
P. Fred'k Obrecht & Son, 4101 East Monument St., Baltimore 5, Md.
(Registered for Egg-O-Milk Co.)
Ogden Grain Co., Utica, N. Y.
Oswego Soy Products Corp., East Seneca St., Oswego, N. Y.
Palm Grain Co., 1801 Gorham St., Lowell, Mass.
Park & Pollard Co., 356 Hertel Ave., Buffalo 7, N. Y.
George H. Parker Grain Co., 56 Water St., Danvers, Mass.
Pasco Packing Assoc., Dade City, Florida
Patent Cereals Co., Geneva, N. Y.
Pillsbury Mills, Inc., Minneapolis 2, Minn.
Pittsburgh Plate Glass Co., Linseed Oil Division, 2-10 Chester Ave., Newark, N. J.
W. N. Potter Grain Stores, Inc., Greenfield, Mass.
Procter & Gamble Distributing Co., Cincinnati 1, Ohio
Publicker Commercial Alcohol Co., 1429 Walnut St., Philadelphia 2, Penn.
Quaker Oats Co., 141 West Jackson Blvd., Chicago 4, Ill.
Ralston Purina Co., St. Louis 2, Mo.
John Reardon & Sons Division of Wilson & Co., Inc., Cambridge, Mass.
Rex Grain & Milling Co., Inc., 95 Kentucky St., Buffalo 4, N. Y.
D. F. Riley, North Hatfield, Mass.
Rodney Milling Co., Kansas City 8, Mo.
Russell-Miller Milling Co., Minneapolis 1, Minn.
Ryther & Warren Co., Belchertown, Mass.
Saunders Mills, Inc., Box 1582 Central Station, Toledo, Ohio
Schenley Distilleries, Inc., 350 Fifth Ave., New York 1, N. Y.
Schoeneck Farms, Inc., R. No. 3, Nazareth, Penn.
Schultz, Baujan & Co., Inc., Beardstown, Ill.
Joseph E. Seagram & Sons, Inc., Louisville, Ky.
Sears, Roebuck & Co., 925 South Homan Ave., Chicago, Ill.
Sheboygan Falls Marketing Assoc., Sheboygan Falls, Wis.
Sherwin Williams Co., 101 Prospect Ave., N. W., Cleveland, Ohio
W. J. Small Co., Neodesha, Kan.
A. W. Staley Manufacturing Co., Decatur, Ill.
Staley Milling Co., Kansas City 16, Mo.
Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
Stratton & Co., Concord, N. H.
Swift & Co., Feed Department, Union Stock Yards, Chicago, Ill.
Swift & Co., Soybean Mills, Champaign, Ill.
Toledo Soybean Products Co., 215 Pontiac St., Toledo, Ohio
Union Sales Corp., Columbus, Ind. (Distributor for Union Starch & Refining Co.)
Union National Mill, Springfield, Ohio
United Cooperative Farmers, Inc., Fitchburg, Mass.
United Farmers Cooperative Creamery Assoc., Inc., Charlestown, Mass.
United Mills Co., Inc., Grafton, Ohio
Unity Feeds, Inc., 177 Milk St., Boston, Mass.
George Urban Milling Co., 332 North Oak St., Buffalo 3, N. Y.
Valley Dehydration Plant, McAllen, Texas
Arthur Ventura Grain Co., Longmeadow Road, Taunton, Mass.
Vita-Vim Millers, 135 Scott St., Buffalo 4, N. Y.
Wakefield Sawdust & Shavings Co., Wakefield, Mass.
Hiram Walker & Sons, Inc., Peoria 1, Ill.
C. P. Washburn Co., Middleboro, Mass.
Wayne County Grangers Feed Corp., Clyde, N. Y.
H. K. Webster Co., Lawrence, Mass.
West-Nesbitt, Inc., Onconta, N. Y.
Western Condensing Co., Petaluma, Cal.
Whitmoyer Laboratories, Inc., Myerstown, Penn.
Williams Bros. Co., Kent, Ohio
Est. M. G. Williams, Box 603, Taunton, Mass.
Stanley Wood Grain Co., Taunton, Mass.
Worcester Grain & Coal Co., Worcester, Mass.

MASSACHUSETTS

AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 126

SEPTEMBER 1945

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff:

This is the seventy-second report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

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INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1945

By Fertilizer Control Service Staff

Philip H. Smith, *Official Chemist in Charge*
John W. Kuzmeski, *Senior Chemist*
Albert F. Spelman, *Assistant Chemist*
C. Tyson Smith, *Assistant Chemist*
Henry B. Rodman, *Junior Chemist*
M. deKay Thompson, *Junior Chemist*

James T. Howard, *Inspector*
Louis A. Graves, *Inspector*
Joseph Conklin, *Inspector*
Joseph A. Martell, *Technical Assistant*
Cora B. Grover, *Senior Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesium.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes

Tonnage reports are required semi-annually, on January 1 and July 1.

Tonnage fee: 6 cents per ton of 2,000 pounds.

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

PHILIP H. SMITH
Massachusetts Agricultural Experiment Station
Amherst, Mass.

Manufacturers and Brands

Registrations have been perfected in Massachusetts during 1945 by 54 firms, covering 229 brands of mixed fertilizer and unmixed fertilizing materials.

The following brands were not found on display by the sampling agent at any point in the state and therefore do not appear in the tables of analyses.

Brands of Fertilizer Registered but Not Sampled

Allied Chemical & Dye Corp., The Barrett Division Sulphate of Ammonia (20.6-0-0)	Humphreys-Godwin Co. Dixie Brand 41% Cottonseed Meal (6.58-0-0)
American Agricultural Chemical Co. AA Quality 4-12-4 Agrico for Cranberries 5-8-7	McCormick & Co., Inc. Hy-Gro 13-26-13
American Cyanamid Co. 21% Aero Cyanamid Pulverized (21-0-0)	Old Deerfield Fertilizer Co., Inc. Old Deerfield 5-8-7 & 2 Set Onion & Potash Fertilizer, Potash other than Muriate Old Deerfield Castor Pomace (5.5-0-0) Old Deerfield Dry Ground Fish (9.5-2-0) Old Deerfield Muriate of Potash (0-0-60) Old Deerfield Superphosphate (0-20-0)
American Liquid Fertilizer Co., Inc. Liqua-Vita 6-9-7	Olds & Whipple, Inc. O & W 5-10-5 O & W 5-10-10-2 Potash
American Potash & Chemical Corp. Trona Muriate of Potash (0-0-60)	Ramshorn Mills, Inc. Sheep Manure—Wool Waste (2-0.5-4.5)
Apothecaries Hall Co. Liberty 0-14-14 Liberty Tobacco Mixture 5-3-5 Liberty Tobacco Starter 5-5-15 Liberty (with Sulphate Potash) 5-10-10 Liberty Tobacco Mixture 6-3-6 Castor Pomace (4.5-0-0) Sulphate Ammonia (20.5-0-0)	Ra-Pid-Gro Corp. Ra-Pid-Gro 23-21-17
Armour Fertilizer Works Armour's Big Crop 0-14-14 Armour's Big Crop 4-12-8 Armour's Victory Garden 5-10-5 Muriate of Potash 60% (0-0-60)	Rogers & Hubbard Co. Red H 5-10-5 Hubbard Dry Ground Fish (9.56-0-0) Hubbard Muriate of Potash (0-0-60)
Berkshire Chemical Co. Berkshire Victory Garden 5-10-5 Specialty Fertilizer 6-6-4	William H. Rorer, Inc. Plant Dinner 5-7-5
Buell Fertilizer Co. Buell Peat Poultry Manure (3-3-1.5)	Ruhm Phosphate & Chemical Co. Red Seal Brand Ruhm's Phosphate Rock 30% (0-30-0)
Consolidated Rendering Co. Corenco Raw Bone & Tankage (4-20-0)	Sears, Roebuck & Co. Garden Master Specialty 5-8-7 Garden Master Victory Garden 5-10-5
Eastern States Farmers' Exchange Eastern States 0-19-19 with Borax Eastern States 5-5-15-1 Tobacco Eastern States 8-4-8 Tobacco Eastern States 8-16-16-1 LCS Eastern States Sulphate of Potash (0-0-52)	Swift & Co., Plant Food Division Swift's Red Steer 5-8-7 Swift's Red Steer 5-10-5 Swift's Red Steer 5-10-10 Sheep Manure (1.5-1-2.5)
	Tennessee Corp. Es-Min-EI

Fertilizer Tonnage

During the past several years publication of the annual bulletin of the Fertilizer Control Service has been delayed by the late filing of tonnage reports by one or two fertilizer companies. Since these late reports generally cover a large tonnage they cannot be ignored in the compilation of the fertilizer tonnage tables. Therefore, in order to advance the publication date of the bulletin henceforth, the tonnage tables in this and future bulletins will include the fertilizers sold from January 1 to January 1 rather than from July 1 to July 1.

Tonnage of Mixed and Unmixed Fertilizers Sold in Massachusetts

	January 1, 1944, to January 1, 1945
Mixed fertilizers	61,824
Fertilizer chemicals and materials unmixed	12,466 <i>a</i>
Pulverized animal manures	1,573
Totals	75,863

a Does not include 15,218 tons of 20% superphosphate distributed by the A.A.A.

Tonnage of Mixed Fertilizers, January 1, 1944, to January 1, 1945

Grade*	Tonnage	Brands	Grade*	Tonnage	Brands
5-8-7	18,627	22	4-12-16	98	—
5-10-10	13,529	21	6-12-4	95	—
5-10-5	8,442	23	6-5-5	82	—
6-3-6	6,517	13	5-15-20	82	—
7-7-7	4,531	11	8-7-3	75	—
3-12-6	2,870	11	.08-16-10	72	—
8-16-16	2,105	—	4-10-10	41	—
5-17-0	945	—	3-12-3	41	—
4-12-4	816	—	3-8-7	40	—
6-10-4	511	—	4-8-4	38	—
6-8-2	447	—	0-20-20	29	—
8-16-8	411	—	4-9-7	20	—
10-10-10	352	—	5-8-5	15	—
5-3-5	308	—	4-16-20	12	—
0-14-14	276	—	0-10-20	10	—
5-10-4	130	—	Miscellaneous	23	—
8-4-8	117	—			
8-8-8	117	—	Totals	61,824	148

*The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1, 1944, to January 1, 1945

Material	Tonnage	Brands	Material	Tonnage	Brands
Nitrate of soda	3,300	—	Sulfate of ammonia	301	5
Superphosphate 20%	2,742	8	Castor pomace	147	—
Pulverized animal manures	1,573	22	Uramon	141	—
Superphosphate 18%	1,414	—	Cyanamid	101	—
Milorganite	1,357	—	Bone and tankage	44	—
Ammonium nitrate	802	—	Superphosphate 47%	31	—
Muriate of potash	737	8	Sulfate of potash	14	—
Bone meal	689	8	Miscellaneous	28	—
Cottonseed meal	633	—			
			Total	14,054	71

MIXED FERTILIZERS
Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
Acme Guano Co.	3	1	9	1	1	0	0
Agricultural Laboratories, Inc.	1	1	3	0	0	0	0
American Agricultural Chemical Co.	80	25	239	37	17	4	10
Apothecaries Hall Co.	17	12	51	3	1	0	1
Armour Fertilizer Works	17	7	51	13	4	2	0
Berkshire Chemical Co.	16	8	42	5	3	1	0
Joseph Breck & Sons Corp.	2	2	6	0	0	0	0
Consolidated Rendering Co.	26	19	75	5	0	3	1
Eastern States Farmers' Exchange	18	8	69	3	4	1	3
Essex County Co-operative Farming Association	3	0	9	3	0	0	0
Excell Laboratories	1	1	3	0	0	0	0
Goulard & Olena, Inc.	1	1	3	0	0	0	0
Grasalo Co.	1	1	3	0	0	0	0
A. H. Hoffman, Inc.	1	0	3	0	0	1	0
Hydroponic Chemical Co., Inc.	1	1	3	0	0	0	0
Hy-Trous Corp.	1	1	3	0	0	0	0
International Minerals & Chemical Corp.	25	13	79	11	4	1	0
Old Deerfield Fertilizer Co., Inc.	18	11	61	2	4	1	0
Olds & Whipple, Inc.	11	11	33	0	0	0	0
Plantabbs Co.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	32	24	83	7	1	0	1
O. M. Scott & Sons Co.	7	1	21	1	0	0	5
Sears, Roebuck & Co.	1	1	3	0	0	0	0
M. L. Shoemaker Division of Wilson & Co., Inc.	1	1	2	0	0	0	0
Swift & Co., Plant Food Division	13	5	39	10	3	1	0
Tennessee Corp.	3	0	9	5	1	0	0
C. P. Washburn Co.	2	0	6	3	0	0	0
Woodruff Fertilizer Works, Inc.	2	2	9	1	0	0	0
TOTALS	305	158	920	110	43	15	21

Average Variation from Guaranteed Analysis

Thirteen firms have registered three or more brands of mixed fertilizers. On the basis of composition found by analysis as well as of tonnage sold, the following table shows that each manufacturer was successful in avoiding average deficiencies in plant food guarantees in his mixtures.

Manufacturer	Average Percentage of Plant Food Above or Below the Minimum Guarantee		
	Nitrogen	Available Phosphoric Acid	Water Soluble Potash
American Agricultural Chemical Co.	+	+	+
Apothecaries Hall Co.	+	+	+
Armour Fertilizer Works	+	+	+
Berkshire Chemical Co.	+	+	+
Consolidated Rendering Co.	+	+	+
Eastern States Farmers' Exchange	+	+	+
Essex County Co-operative Farming Association	+	+	+
International Minerals & Chemical Corporation	+	+	+
Old Deerfield Fertilizer Co., Inc.	+	+	+
Olds & Whipple, Inc.	+	+	+
Rogers & Hubbard Co.	+	+	+
Sears, Roebuck & Co.	+	+	+
Swift & Co., Plant Food Division	+	+	+

Calculation of Shortages

For calculating the approximate commercial shortages per ton the following figures were used:

	Retail Cost Per Unit
Nitrogen:	
Water-soluble and synthetic organic	\$2.00
Water-insoluble of good quality and Water-soluble amounting to one-eighth of the percentage of water-insoluble nitrogen found when the percentage of water-insoluble nitrogen exceeds .50	8.00
Available phosphoric acid.....	1.40
Potash:	
Muriate.....	.80
Sulfate.....	1.10
From cotton hull and boll ashes and wood ashes.....	1.25

These values represent the average retail cost to the consumer of the plant food elements in *unmixed* materials. This does not include mixing and overhead costs which increase the retail cost of these elements in mixed goods.

To compensate for the increased unit cost in mixed goods the commercial shortage as found by using our values is multiplied by the factor: Actual retail selling price divided by our calculated guaranteed value.

Example: A 5-8-7 fertilizer selling for \$39.00 a ton analyzes:

Total nitrogen.....	4.67
Water-insoluble nitrogen .....	.88
Available phosphoric acid.....	7.43
Potash.....	7.13

Shortage: Nitrogen	$.33 \times \$2.00 = \0.66
Available phosphoric acid.....	$.57 \times 1.40 = .80$
Total.....	\$1.46

Our calculated guaranteed value:

Water-insoluble nitrogen	=	.88 + .11 = .99	×	\$8.00	=	\$7.92
Water-soluble nitrogen	=	5.00 - .99 = 4.01	×	\$2.00	=	8.02
Available phosphoric acid	=	8.00	×	\$1.40	=	11.20
Potash	=	7.00	×	\$0.80	=	5.60
Total.....						<u>\$32.74</u>

Approximate commercial shortage = $(39.00 \div 32.74) \times 1.46 = \1.74 per ton.

Explanation of Table of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand", and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

From the Control Official's viewpoint, the amount of overrun, within reasonable limits, found in any sample of fertilizer is not especially significant. Of main importance is the fact that the particular sample analyzed shows that the manufacturer of the brand represented by the sample is selling a product which is or is not substantially as guaranteed. The manufacturer whose 4-9-7 brand is found by the Control Official to be running 4.01-9.03-7.02 in every sample of the brand tested is meeting all requirements covering this part of the fertilizer control laws as fully as the manufacturer of another 4-9-7 brand found to run 4.85-9.95-7.90 in each sample tested.

Therefore this table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton

Name of Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Where Sampled	Approximate Commercial Shortage Per Ton
	Water Insoluble	Total				
American Agricultural Chemical Co.						
Agrico for Truck 4-12-4 (a)	.13	3.83	11.56	4.12	Mount Hope Farm, Taunton	\$1.20
Agrico for Gardens (Victory Garden) 5-10-5	.15	5.16	7.95	5.67	Bond Grain Co., Charlton Depot	6.17
Agrico for Gardens (Victory Garden) 5-10-5	.35	5.08	7.66	5.46	Frank A. Davoll, Dartmouth	5.14
Agrico for Gardens (Victory Garden) 5-10-5	.28	5.00	8.44	5.24	W. N. Potter Grain Stores, Inc., Charlemont	4.97
Agrico for Gardens (Victory Garden) 5-10-5	.11	4.78	8.31	4.64	Chas. R. Conant, Whitman	6.63
Agrico for Gardens (Victory Garden) 5-10-5	.47	4.75	9.39	5.09	General Mills, Inc., New Bedford	2.89
Agrico for Gardens (Victory Garden) 5-10-5	.30	4.88	8.74	5.38	W. K. Gilmore & Sons, Inc., Wrentham	4.28
Agrico for Gardens (Victory Garden) 5-10-5	.20	5.16	8.50	5.53	W. K. Gilmore & Sons, Inc., Franklin	4.26
Agrico for Gardens (Victory Garden) 5-10-5	.30	5.19	7.94	5.41	Nickerson Lumber Co., Orleans	6.17
Agrico for Gardens (Victory Garden) 5-10-5	.27	5.03	7.80	5.42	General Mills, Inc., Stoughton	6.59
Agrico for Gardens (Victory Garden) 5-10-5 (a)	.18	4.97	8.55	5.42	Winer Hardware Co., Quincy	4.32
Apothecaries Hall Co.						
Liberty Fertilizer 5-10-5 (a)	1.21	5.82	9.11	6.37	Joseph Zgrodnik, Amherst	1.62
Consolidated Rendering Co.						
Corenco 0-14-14 Top Dresser (a)	—	—	12.77	12.91	Haley's Grain Store, Palmer	3.67
Corenco 7-7-7 Complete Fruit & Top Dressing (a)	.16	6.21	8.00	6.48	W. N. Potter Grain Stores, Inc., North Adams	3.23 ²
Eastern States Farmers' Exchange (a)						
Eastern States 10-10-10, 1% magnesium oxide (b)	.28	8.71	11.39	13.04	E. M. Brooks, Middleboro	3.02
Eastern States 10-10-10, 1% magnesium oxide (c)	.36	8.88	13.24	10.46	Charles S. Bliss, Rehoboth	2.59

^a See also table of "Mixtures substantially complying with guarantees."

^b Magnesium oxide found, 1.05%.

^c Magnesium oxide found, 1.01%.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton—Concluded

Name of Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Where Sampled	Approximate Commercial Shortage Per Ton
	Water Insoluble	Total				
A. H. Hoffman, Inc.						
Hoffman's Victory Garden 5-10-5 . . . . .	.49	4.39	10.90	6.48	Whitcomb Carter Co., Beverly	<i>d</i>
Old Deerfield Fertilizer Co., Inc.						
Old Deerfield 8-16-16 . . . . .	.16	7.70	15.65	16.66	Anthony Kuzmeskus, Greenfield	1.52
Rogers & Hubbard Co.						
Hubbard Potato Fertilizer 5-8-7 (a) . . . . .	.81	3.91	9.54	7.30	Antone Frado, Somerset	2.92
O. M. Scott & Sons Co.						
Scotts Garden Builder 5-10-5 (a) . . . . .	.34	3.75	10.75	5.70	Waite Hardware Co., Southbridge	<i>d</i>
Scotts Turf Builder 8-7-3 . . . . .	.94	6.71	7.81	4.62	Waite Hardware Co., Webster	<i>d</i>
Scotts Turf Builder 8-7-3 (a) . . . . .	.98	5.98	8.58	4.60	Butler & Ullman, Northampton	<i>d</i>
Scotts Turf Builder 8-9-3 . . . . .	.88	7.29	10.16	3.30	H. V. Lawrence, Inc., Falmouth	5.34
Scotts Turf Builder 8-9-3	1.08	8.45	9.14	1.72	L. Richmond Co., Inc., Brockton	3.46
Swift & Co., Plant Food Division						
Vigoro Victory Garden Fertilizer 5-10-5 (a) . . . . .	.19	5.09	9.39	4.90	F. H. Crane & Sons, Inc., Quincy	2.42

^a See also table of "Mixtures substantially complying with guarantees."

d Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with other seriously deficient mixtures.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Acme Guano Co.		
Acme 5-8-7	2	.27
Acme 5-10-10	1	.21
Agricultural Laboratories, Inc.		
Stim-U-Plant 11-12-15	1	.07
American Agricultural Chemical Co.		
AA Quality Fertilizer 5-8-7	4	.27
AA Quality Fertilizer 5-10-10	1	.43
Agrico Phosphate & Potash 0-14-14	1	—
Agrico for Truck 4-12-4	5 <i>a</i>	.19
Agrico for Corn 4-12-8	4	.26
Agrico for New England 4-12-8	6	.21
Agrico for Seeding Down 4-12-16	3	.16
Agrico for New England 5-8-7	15	.29
Agrico for Gardens (Victory Garden) 5-10-5	9 <i>a</i>	.32
Agrico for Potatoes 5-10-10	8	.24
Agrico for Tobacco 6-3-6	4 <i>b</i>	3.70
Agrico for Lawn Trees & Shrubs 6-10-4	3	.15
Agrico for Top Dressing 7-7-7	6	.12
Apothecaries Hall Co.		
Liberty Fertilizer 4-12-4	2	.39
Liberty High Grade Market Gardeners -5-8-7	2	.79
Liberty High Grade Market Gardeners (with Sulphate Potash) 5-8-7	1 <i>c</i>	.55
Liberty Fertilizer 5-10-5	1 <i>a</i>	1.25
Liberty Victory Garden 5-10-5	3	.92
Liberty Fertilizer 5-10-10	2	.46
Liberty Tobacco Mixture (with Cotton Hull Ashes) 6-3-6	2 <i>b</i>	2.97
Liberty Green-Gro 6-7-4	1	1.97
Liberty Special for Fruit & Grass 7-7-7	2	1.02
Armour Fertilizer Works		
Armour's Big Crop Fertilizer 4-12-4	2	.21
Armour's Big Crop Fertilizer 5-8-7	2	.34
Armour's Big Crop Fertilizer 5-10-5	3	.39
Armour's Big Crop Fertilizer 5-10-10	4	.33
Armour's Big Crop Tobacco Special 6-3-6	1 <i>b</i>	3.07
Armour's Big Crop Fertilizer 7-7-7	3	.30
Armour's Big Crop Fertilizer 8-16-16	1.	.20
Armour's Special Ornamental Fertilizer 6-12-4	1	.31
Berkshire Chemical Co.		
Berkshire 4-12-4	1	.24
Berkshire 5-8-7	5	.19
Berkshire 5-10-5	1	.20
Berkshire 5-10-10	3	.23
Berkshire Tobacco 6-3-6	2 <i>b</i>	2.64
Berkshire 7-7-7	4	.16
Joseph Breck & Sons Corporation		
Breck's Victory Fertilizer 5-10-5	1	.34
Brexone for Gardens & Lawns 5-10-4	1	.84
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser	15 <i>a</i>	—
Corenco 4-12-4 Complete Manure	19	.21
Corenco 5-8-7 Potato & General Crop	30	.20
Corenco 5-10-5 Victory Garden Fertilizer	2	.23
Corenco 5-10-10 Peerless Potato	25	.19
Corenco 6-3-6 Special Tobacco Grower	1 <i>b</i>	3.45
Corenco 6-8-2 Landscape Fertilizer	2	.30
Corenco 7-7-7 Complete Fruit & Top Dressing	2 <i>a</i>	.14

a. See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b. Potash in forms other than muriate.

c. Potash in form of muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Eastern States Farmers' Exchange		
Eastern States 0-10-20 with Borax, 2% magnesium oxide	1	—
Eastern States 5-10-5 Victory Garden, 2% magnesium oxide	4	.24
Eastern States 5-10-10, 1% magnesium oxide	2	.19
Eastern States 5-15-20, 1% magnesium oxide	1	.16
Eastern States 8-16-16, 1% magnesium oxide	3	.30
Eastern States 8-24-8	2	.33
Eastern States 10-10-10, 1% magnesium oxide	3 ^a	.31
Essex County Co-operative Farming Association		
S-X Brand 5-8-7	1	.23
S-X Brand (2% magnesium oxide) 5-10-10	1	.15
S-X Brand 7-7-7	1	.16
Excell Laboratories		
New Plant Life 2-1-2	1	.03
Goulard & Olena, Inc.		
Rose Food 5-7-4	1	.60
Grasalo Co.		
Grasalo 5-10-5	1	.20
Hydroponic Chemical Co., Inc		
Hyponex 7-6-19	1	.10
Hy-Trous Corporation		
Hy-Trous 4-8-4	1	—
International Minerals & Chemical Corporation		
International 0-14-14	1	—
International 4-12-4	2	.14
International 4-12-8	1	.20
International 4-12-16	1	.08
International 5-8-7	3	.19
International 5-10-5	3	.30
International Specialty 5-10-5	2	.15
International Victory Garden 5-10-5	2	.20
International 5-10-10	2	.16
International 5-10-10 Potato, 2% magnesium oxide	1	.06
International 6-3-6	1 ^b	2.85
International 7-7-7	2	.15
International 8-16-16, 1 1/2% magnesium oxide	3	.22
International Caribee 5-10-10, 2% magnesium oxide	1	.43
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 4-12-8	1	.34
Old Deerfield 5-8-7 Onion and Truck	2	.83
Old Deerfield 5-10-5 Trucker's Special	1	.44
Old Deerfield 5-10-10 Potato Fertilizer	4	.50
Old Deerfield 5-10-10 (2% magnesium oxide) Potato, Potash other than Muriate	3 ^d	.58
Old Deerfield 6-3-6 Complete Tobacco	4 ^b	3.70
Old Deerfield Lawnshrub 6-5-5	1	1.86
Old Deerfield 7-7-7 Grass Top Dressing	1	.14
Olds & Whipple, Inc.		
O & W 4-12-4 Market Garden	1	.66
O & W 5-3-5 Complete Tobacco	1 ^b	2.67
O & W 5-8-7 Potato & General Purpose	3	.46
O & W 5-8-7 Potato & General Purpose, with Sulphate of Potash	1 ^b	.51
O & W 5-10-10 Potato	2	.52
O & W 6-3-6 Blue Label Tobacco	1 ^b	3.35
O & W 6-3-6 Blue Label Tobacco, Potash derived from Cotton Hull Ash	1 ^b	3.08
O & W 7-7-7 Top Dressing & Grass	1	1.01

a. See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b. Potash in forms other than muriate.

d. In one sample the potash was in form of muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Plantabbs Co.		
Fulton's Plantabbs 11-15-20	1	.08
Rogers & Hubbard Co.		
Gro-Fast Plant Food 5-8-5	2	.97
Hubbard Potato Fertilizer 5-8-7	3 <i>a</i>	1.57
Hubbard High Potash Fertilizer 5-10-10	2	1.34
Hubbard Tobacco Grower 6-3-6	3 <i>b</i>	3.21
Hubbard Victory Garden Fertilizer 5-10-5	3	.66
Red H 6-14-14	1	—
Red H 4-12-4	5	.52
Red H 4-12-8	3	.43
Red H 5-8-7	4	.50
Red H 5-10-10	2	.49
Red H 7-7-7	2	.39
Red H 8-16-16	1	.45
O. M. Scott & Sons Co.		
Scotts Garden Builder 5-10-5	1 <i>a</i>	.36
Scotts Turf Builder 8-7-3	1 <i>a</i>	1.95
Sears, Roebuck & Co.		
Garden Master Plant Food 5-10-5	1	.32
M. L. Shoemaker Division of Wilson & Co. Inc.		
Shoemaker's "Swift-Sure" Tobacco Starter 4-10-0	1	.85
Swift & Co., Plant Food Division		
Vigoro 4-12-4	9	.33
Vigoro Victory Garden Fertilizer 5-10-5	3 <i>a</i>	.25
Tennessee Corporation		
5-10-5 All Purpose Loma	2	.27
5-10-5 Victory Garden Loma	1	.19
C. P. Washburn Co.		
Market Garden 5-8-7	1	.35
Special Potato 5-10-10	1	.22
Woodruff Fertilizer Works, Inc.		
Woodruff's 5-8-7 Fertilizer	2	.62
Woodruff's 6-3-6 Tobacco Special	1 <i>b</i>	2.62

a. See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b. Potash in forms other than muriate.

NITROGEN COMPOUNDS

Ammonium Nitrate, Calcium Cyanamid, Castor Pomace, Cottonseed Meal,
Nitrate of Soda, Sulphate of Ammonia, Synthetic Urea

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
Allied Chemical & Dye Corp., The Barrett Division		
Arcadian the American Nitrate of Soda	16.04	16.00
Arcadian the American Nitrate of Soda	15.74	16.00
Arcadian Sulphate of Ammonia	20.92	20.60
American Cyanamid Co.		
20.6% Aero Cyanamid Granular	21.16	20.60
20.6% Aero Cyanamid Granular	20.20	20.60
20.6% Aero Cyanamid Granular	20.30	20.60
Ashcraft-Wilkinson Co.		
Nitraprills Fertilizer Compound (a)	32.94	32.50
Nitraprills Fertilizer Compound	32.75	32.50
Nitraprills Fertilizer Compound	32.83	32.50
Nitraprills Fertilizer Compound	32.98	32.50
Nitraprills Fertilizer Compound	32.60	32.50
Nitraprills Fertilizer Compound	32.58	32.50
Nitraprills Fertilizer Compound	33.28	32.50
Nitraprills Fertilizer Compound	32.64	32.50
Nitraprills Fertilizer Compound	32.02	32.50
Chilean Nitrate Sales Corporation		
Chilean Nitrate of Soda—Champion Brand	15.97	16.00
Chilean Nitrate of Soda—Champion Brand	16.14	16.00
Chilean Nitrate of Soda—Champion Brand	16.00	16.00
Chilean Nitrate of Soda—Champion Brand	15.98	16.00
Chilean Nitrate of Soda—Champion Brand	16.10	16.00
Consolidated Rendering Co.		
Sulphate of Ammonia	21.07	20.50
E. I. du Pont de Nemours & Co., Inc.		
Du Pont Uramon Fertilizer Compound	42.20	42.00
International Minerals & Chemical Corporation		
Castor Pomace	5.93	4.53
Castor Pomace	6.20	4.53
L. B. Lovitt & Co.		
Lovitt Brand Cottonseed Meal 41%	6.60	6.56
Lovitt Brand Cottonseed Meal 41%	6.66	6.56
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield Sulphate of Ammonia	20.66	20.50
Olds & Whipple, Inc.		
Castor Pomace	6.19	4.50
Brand Showing Commercial Shortage of More than \$1 per Ton		
Ashcraft-Wilkinson Co.		
Cotton Seed Meal	5.64 b	5.76

a Composite of 3 samples.

b Commercial shortage, \$1.17 per ton.

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Apothecaries Hall Co.	60.42	60.00
Consolidated Rendering Co.	60.17	60.00
Eastern States Farmers' Exchange	59.37	60.00
Farm Bureau Association	60.30	60.00
International Minerals & Chemical Corporation	{ 60.88 58.88 60.70 58.96 60.48	{ 60.00 60.00 60.00 60.00 60.00

Brand Showing Commercial Shortage of More than \$1 per Ton

International Minerals & Chemical Corporation	57.41 <i>a</i>	60.00
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a Commercial shortage, \$1.85 per ton.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
18% Normal Superphosphate	19.00	18.80	18.00
18% Normal Superphosphate	17.87	17.57	18.00
Apothecaries Hall Co.			
Superphosphate 20%	21.50	21.00	20.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%	22.00	20.70	20.00
Consolidated Rendering Co.			
Corenco 20% Superphosphate	20.95	20.39	20.00
Davison Chemical Corporation			
Davco Granular Superphosphate 20%	21.50	20.96	20.00
Eastern States Farmers' Exchange			
Eastern States Superphosphate 20%	21.25	20.63	20.00
International Minerals & Chemical Corporation			
International Superphosphate 20%	20.80	20.34	20.00
Rogers & Hubbard Co.			
Hubbard 20% Superphosphate	20.40	20.22	20.00

Brands Showing Commercial Shortage of More than \$1 per Ton

Acme Guano Co.			
Superphosphate 20%	18.65	18.15 <i>a</i>	20.00
Eastern States Farmers' Exchange			
Eastern States Triple Superphosphate 47%	41.07	40.68 <i>b</i>	47.00

a Commercial shortage, \$2.83 per ton.

b Commercial shortage, \$6.61 per ton.

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Dry Ground Fish, Animal Tankage, Milorganite

Manufacturer	Nitrogen		Total Phosphoric Acid		Available Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed
Apothecaries Hall Co. Dry Ground Fish	10.09	9.00	6.28	5.00	—	—
N. Roy & Son Animal Tankage	7.02	7.00	13.67	8.00	—	—
Sewerage Commission of the City of Milwaukee						
Milorganite	6.15	6.00	2.88	—	2.48	2.00
Milorganite	6.09	6.00	2.80	—	2.42	2.00
Milorganite	6.08	6.00	2.83	—	2.47	2.00
Milorganite	6.38	6.00	2.73	—	2.37	2.00
Milorganite	6.27	6.00	2.83	—	2.47	2.00
Milorganite	6.01	6.00	2.83	—	2.47	2.00
Milorganite	6.39	6.00	3.00	—	2.60	2.00
Milorganite	5.93	6.00	2.85	—	2.49	2.00
Milorganite	5.91	6.00	2.85	—	2.49	2.00
Milorganite	6.37	6.00	3.00	—	2.60	2.00
Milorganite	5.78	6.00	2.90	—	2.34	2.00

Adulterated Bone Meal

Analysis of several samples of bone meal collected by the fertilizer inspectors of the Control Service early in the spring of 1945 disclosed that some of the bone meal had been adulterated by the addition of phosphate rock and sulfate of ammonia or urea or both. In order to ascertain the extent of the adulteration, the inspectors were instructed to collect as many samples of bone meal as possible. A total of 71 samples was taken and 29 were found to be mixtures of bone meal and the ingredients listed above.

As soon as it was possible to place the responsibility for the distribution of the adulterated bone meal, the Control Service sent out notices to stop further sales of the product. The distributors found to be handling this mixture were the American Agricultural Chemical Company, the Apothecaries Hall Company, and the Rogers & Hubbard Company. These companies have also distributed other bone meal which was not adulterated, and stated that they had purchased the adulterated bone meal from a broker acting for the Summers Fertilizer Company of Baltimore, Maryland. Upon receiving our notice to stop further sales of the product, the three companies involved immediately issued orders to their dealers to comply. Subsequently, acting on instructions from the Summers Fertilizer Company, they notified their dealers to return all unsold stocks to the Summers Fertilizer Company or to dispose of them otherwise than by sale as bone meal. Records supplied by the three fertilizer companies show that about 170 tons of this adulterated bone meal had been placed on the market in Massachusetts. About 47 tons were removed from sale, leaving a total of 123 tons that had reached consumers' hands.

In fairness to the three companies involved, it should be stated that routine analysis would not detect the adulteration of the bone meal under discussion.

The usual analysis is for total nitrogen and total phosphoric acid, and in most cases the product was up to the guarantee in this respect. Basing the purchase on the usual analysis, therefore, the purchaser would buy the material as genuine bone meal as represented, unless there was reason to suspect its nature because of other factors.

A large number of the sales of bone meal in Massachusetts are generally unrecorded cash sales of one or two bags or less. In such cases payment of rebate to the retail purchaser is impossible. However, some sales are in quantity large enough to be recorded. In these instances it is the policy of the Control Service to insist upon payment of any rebate due to the retail purchaser. This rebate is always based on the retail selling price of the material found deficient or adulterated.

In order to arrive at a satisfactory evaluation of the adulterated bone meal under discussion it was necessary to determine its approximate average composition. Analysis of all bone meal samples collected during the 1945 season gave the following data:

	Average 29 samples Adulterated Bone Meal	Average 42 samples Unadulterated Bone Meal
Total nitrogen.....	2.56	3.24
Water insoluble nitrogen.....	0.54	2.78
Percentage of total nitrogen as water insoluble.....	21.09	85.80
Total phosphoric acid.....	25.62	23.33
Sulfur.....	2.32	0.11
Fluorine.....	1.92	0.08
Nitrogen from ammonia and/or urea.....	1.90	0.18

Using the neutral ammonium citrate procedure prescribed for the determination of available phosphoric acid in mixed fertilizers and superphosphates, the *apparent* average available phosphoric acid content of adulterated bone meal was found to be 6.74%; unadulterated bone meal, 15.01%.

The following calculations were used in determining the average composition of the adulterated bone meal and the average rebate due the retail purchasers of this product:

$21.09 \div 85.80 = 24.58$ average percentage of bone meal in adulterated mixtures. Based on average percentage of total nitrogen as water insoluble nitrogen in unadulterated bone meal.

$1.90 - .18 = 1.72$ percentage of nitrogen from sulfate of ammonia and/or urea. In most cases this nitrogen was from sulfate of ammonia. For calculation of average rebate it was assumed that all of this nitrogen was from sulfate of ammonia.

$1.72 \div 20.50 = 8.34$ average percentage of sulfate of ammonia in adulterated bone meal.

$100 - 32.92$ (percentage of sulfate of ammonia + bone meal) = 67.08 average percentage of phosphate rock in adulterated bone meal. This indicates the use of phosphate rock containing about 3.00% fluorine which is about the normal fluorine content of domestic rock usually used in the manufacture of superphosphate.

Retail prices per ton used in computing average rebate:

Unadulterated bone meal.....	\$60.69
Sulfate of ammonia.....	45.00
Phosphate rock.....	24.02

The price for unadulterated bone meal represents the average retail selling price quoted by dealers. The price for sulfate of ammonia is the retail cash delivered price quoted by several fertilizer manufacturers. The price for phosphate rock is the average retail cash delivered price quoted by two large fertilizer manufacturers. Since these are retail prices all costs for handling, grinding, bagging, bags, overhead, shipping costs, agents' commissions, etc. are included. The cost of mixing the various ingredients to form the adulterated mixture is not allowed.

$$.2458 \times 60.69 = 14.92 \text{ retail value of unadulterated bone meal}$$

$$.0834 \times 45.00 = 3.75 \text{ retail value of sulfate of ammonia}$$

$$.6708 \times 24.02 = 16.11 \text{ retail value of phosphate rock}$$

\$34.78 calculated retail value of one ton of adulterated bone meal.

Average retail selling price of adulterated bone meal	\$56.14
Computed retail value	34.78
	<hr/>
Calculated rebate per ton due <i>retail</i> purchaser (average)	\$21.36

It is emphasized that the value of \$34.78 per ton for the adulterated bone meal is what the Control Service considers a fair *retail* selling price for this product. It is used only to establish the average rebate of \$21.36 per ton to which the *retail* purchaser is entitled. Any adjustment between the Summers Fertilizer Company and the three distributors of the adulterated product is outside the province of the Control Service.

Through Control Officials in Maryland the adulteration of bone meal sold in this and other states has been brought to the attention of the Federal Office of Price Administration.

Adulterated Bone Meal

Manufacturer and Place Sampled	Total Nitrogen		Water Insoluble Organic Nitrogen	Nitrogen from Ammonia, Sulfate of Ammonia, and/r Urea	Total Phosphoric Acid		Sulfur	Fluorine
	Found	Guaranteed			Found	Guaranteed		
American Agricultural Chemical Co.								
J. B. Garland & Son, Inc., Worcester	2.76	2.50	.49	2.22	25.38	20.00	3.03	2.07
Waldron Hardware Co., Taunton	2.66	2.50	.49	2.17	25.00	20.00	2.93	1.94
Wm. Flynn & Son, Attleboro	2.78	2.50	.50	2.13	25.35	20.00	2.99	2.13
Smith Grain Store, Fitchboro	2.76	2.50	.55	2.20	24.40	20.00	2.97	1.75
C. P. Washburn Co., Middleboro	2.51	2.50	.57	1.92	25.00	20.00	2.47	1.75
Bond Grain Co., Chanton Depot	2.70	2.50	.57	2.09	25.20	20.00	2.97	1.79
General Mills, Inc., New Bedford	2.98	2.50	1.05	1.98	24.30	20.00	2.29	1.87
L. Grossman & Sons, Inc., New Bedford	1.78	2.50	.24	1.32	26.00	20.00	.84	2.86
Pisbee Bros., Williamsburg	3.06	2.50	.43	2.38	25.25	20.00	3.33	1.99
John Allnach, Marion	2.86	2.50	.61	2.04	25.50	20.00	2.63	1.87
A. S. Gurney Co., Wareham	2.43	2.50	.41	1.98	27.50	20.00	.93	2.83
Lawson Prins & Seed, Brockton	3.05	2.50	.49	2.56	24.50	20.00	3.26	1.93
J. H. Farbanks Co., Bridgewater	2.90	2.50	.60	2.30	25.20	20.00	3.19	1.96
Town Squaine Hardware and Supply Co., Norwood	2.73	2.50	.56	2.17	23.85	20.00	2.61	1.91
Kingston Hardware Co., Kingston	2.69	2.50	.46	2.18	25.55	20.00	2.90	2.06
Apothecaries Hall Co.								
Farmers Co-operative Exchange, Framingham	2.56	2.25	.42	2.14	25.40	22.00	2.78	2.06
Ellison Coal and Grain Co., Haverhill	2.54	2.25	.48	1.95	26.35	22.00	2.55	2.28
J. H. Smith, Haverhill	2.49	2.25	.61	1.77	25.70	22.00	2.35	2.30
Rogers & Hubbard Co.								
Cutler Grain Co., Framingham	2.49	2.00	.41	1.64	25.35	23.00	1.95	2.45
Rogers & Hubbard Co., Warehouse, Hatfield	2.12	2.00	.29	1.78	29.90	23.00	.58	2.93
Conlon & Donnelly, Attleboro	2.13	2.00	.43	1.63	26.00	23.00	1.60	1.57
City Grain Co., Marlboro	2.30	2.00	.59	1.70	26.75	23.00	2.07	2.07
Shaw's Greenhouses, North Dartmouth	2.41	2.00	.48	1.73	26.75	23.00	2.60	2.02
Darling's Flower Shop, Fairhaven	2.49	2.00	.48	1.80	26.90	23.00	2.35	2.11
Van's Nursery and Landscape Service, Mattapoisett	2.35	2.00	.51	1.84	26.90	23.00	2.61	1.97
John Sears, Jr., South Yarmouth								
Drinkwater & Co., Randolph	2.78	2.00	.56	1.84	25.20	23.00	2.34	2.39
General Mills, Inc., Stoughton	1.79	2.00	.89	1.73	26.60	23.00	.67	.30
North Walpole Greenhouses, North Walpole	2.57	2.00	.80	1.60	24.35	23.00	2.02	.63
	2.70	2.00	.80	1.64	23.05	23.00	2.23	.63

International Minerals & Chemical Corporation	3.25	2.47	2.94	.08	23.35	23.00	.11	.03	39.4
John Reardon & Sons Division of Wilson & Co., Inc.	3.22	2.47	3.01	.06	19.28	21.00	.10	.05	25.9
	3.35	2.70	2.70	.23	20.23	21.00	.08	.06	23.8
	3.06	2.47	3.33	.16	18.68	21.00	.10	.04	50.3
	3.59	2.47	2.80	.22	21.10	21.00	.11	.06	38.3
Rogers & Hubbard Co.	4.45	2.00	3.67	.09	20.63	23.00	.11	.08	26.2
	3.60	3.70	3.54	.06	25.25	20.00	.10	.04	4.9
	3.98	3.70	3.65	.15	23.60	20.00	.21	.07	21.4
	3.91	4.00	3.80	.07	24.00	23.00	.14	.05	25.5
	4.26	4.00	3.83	.08	24.10	23.00	.10	.06	5.4
	3.88	4.00	3.80	.05	24.65	23.00	.10	.06	33.4
	4.25	3.70	3.98	.09	23.75	24.70	.05	.06	4.9
	4.18	3.70	3.98	.14	23.32	24.70	.11	.07	9.5

Brands Showing Commercial Shortage of \$1 or More Per Ton

Consolidated Rendering Co.	1.87	2.47 ^b	1.47	.13	21.85	23.00	.14	.06	30.1
A. H. Hoffman, Inc.	3.57	3.70 ^c	2.91	.10	18.05	20.00	.19	.09	48.2

^a Old stock

^b Commercial shortage, \$6.41 per ton.

^c Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient materials.

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen		Available Phosphoric Acid		Total Phosphoric Acid		Water Soluble Potash		Organic Matter	Acid Insoluble Ash (d)	Moisture
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed			
American Agricultural Chemical Co.											
Sheep Manure	1.52	1.25	—	—	1.50	1.00	3.93	3.00	45.69	31.34	5.33
Sheep Manure	1.53	1.25	—	—	1.63	1.00	3.56	3.00	37.18	42.13	4.82
Sheep Manure	1.57	1.25	—	—	1.50	1.00	4.15	3.00	44.67	31.36	5.98
Apothecaries Hall Co.											
Liberty Sheep Manure	1.34	1.00	1.10	.50	1.30	—	3.45	1.00	35.76	45.10	4.09
Liberty Sheep Manure	1.21	1.00	1.16	.50	1.30	—	2.81	1.00	44.69	32.02	5.89
Armour Fertilizer Works											
Armour's Pulverized Sheep Manure	1.44	1.50	—	—	1.60	1.00	3.78	2.50	37.00	41.46	5.33
Armour's Pulverized Sheep Manure	1.51	1.50	—	—	1.35	1.00	4.16	2.50	41.39	37.63	4.34
Atkins & Durbrow, Inc.											
Driconure	2.63	2.00	2.78	1.00	2.98	1.00	1.38	1.00	58.87	19.34	9.07
Driconure	3.36	2.00	—	—	2.73	1.00	1.62	1.00	67.02	5.46	15.09
Driconure	3.13	2.00	2.84	1.00	3.08	1.00	1.44	1.00	65.69	5.01	15.87
Driconure	3.39	2.00	—	—	2.75	1.00	1.86	1.00	69.75	6.77	10.52
Driconure	1.79	2.00	1.75	1.00	1.75	1.00	.97	1.00	34.36	47.20	11.28
OK Manure	1.58	2.00	1.63	1.00	1.63	1.00	.92	1.00	29.97	55.66	8.24
OK Manure	1.76	2.00	1.70	1.00	1.70	1.00	.98	1.00	37.49	48.24	10.61
OK Manure	1.74	2.00	1.68	1.00	1.68	1.00	.75	1.00	29.64	60.26	4.40
OK Manure	1.46	2.00	1.03	1.00	1.25	1.00	.86	1.00	27.23	61.77	5.07
OK Manure	1.89	2.00	1.48	1.00	1.60	1.00	.82	1.00	36.15	50.44	7.61
Consolidated Rendering Co.											
Corenco Sheep Manure	1.75	1.25	—	—	1.65	1.00	4.08	2.00	48.71	25.71	7.94
Corenco Sheep Manure	1.94	1.25	—	—	1.78	1.00	3.28	2.00	60.79	16.93	6.57
Corenco Sheep Manure	2.27	1.25	—	—	1.20	1.00	3.38	2.00	44.04	31.51	6.74
Glendale Poultry Farm											
Buff Peat-Poultry Manure	2.24	2.00	3.05	3.00	3.65	—	1.70	1.00	49.74	16.81	13.07

A. H. Hoffman, Inc.												
Hoffman's Cow Manure (Dehydrated)	2.25	2.00	1.69	1.00	1.83	—	2.43	1.00	80.72	2.00	5.17	
Hoffman's Sheep Manure (Kiln Dried)	1.26	1.50	1.28	1.00	1.40	—	3.10	2.50	29.57	51.57	4.56	
International Minerals & Chemical Corporation												
International Sheep Manure	1.75	1.25	—	—	1.55	1.00	3.46	2.00	44.05	31.95	7.98	
Norwood Brand Fertilizer Co.												
Norwood Brand Sheep Manure and Wool Waste	1.74	1.83	.45	.89	.45	—	3.97	1.03	40.49	38.34	6.33	
Norwood Brand Sheep Manure and Wool Waste	1.46	1.83	.46	.89	.46	—	3.34	1.03	33.50	49.61	4.39	
Norwood Brand Sheep Manure and Wool Waste	1.87	1.83	.39	.89	.39	—	3.81	1.03	39.23	39.79	5.84	
Pulverized Manure Co.												
Wizard Brand Cow Manure	2.18	2.00	2.13	1.00	2.13	—	2.76	1.00	53.88	25.78	5.13	
Wizard Brand Pulverized Sheep Manure	2.07	2.00	1.63	1.00	1.75	—	3.91	2.00	61.85	14.59	7.02	
Rogers & Hubbard Co.												
Gro-Fast Cow Manure	2.01	1.50	—	—	1.30	1.00	1.73	2.00	31.21	49.67	14.24	
Gro-Fast Cow Manure	1.95	1.50	—	—	1.20	1.00	1.82	2.00	31.32	43.50	11.51	
Gro-Fast Sheep Manure	1.57	1.25	—	—	1.55	1.00	3.98	2.50	40.08	58.09	4.53	
Gro-Fast Sheep Manure	1.45	1.25	—	—	1.45	1.00	2.89	2.50	39.03	40.92	4.41	
Stockdale Fertilizer Co.												
Ovone (Sheep Manure)	2.21	2.00	1.50	1.00	1.50	—	2.62	2.00	65.76	13.51	6.96	
Walker Gordon Laboratory Co.												
Bovung	2.16	2.00	1.39	1.00	1.63	—	2.63	1.00	81.91	2.50	3.64	
Bovung	2.12	2.00	1.38	1.00	1.38	—	2.73	1.00	81.73	2.34	4.89	

^a The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food.

AGRICULTURAL LIME PRODUCTS

Manufacturers and Brands

During 1945, 13 firms registered for sale in Massachusetts 28 brands of lime products, manufactured and sold for neutralizing acid soils. The products are grouped as follows:

Hydrated or slaked lime	14
Pulverized and ground limestone	14
	28

The analytical results which appear in this bulletin represent officially drawn samples secured by the same sampling agents who drew the samples of commercial fertilizer which served for the inspection of that commodity; the samples therefore came from every section of the state and are, we believe, representative of the lime products sold in Massachusetts as soil amendments.

We were not successful in securing samples of the following brands:

Brewer & Co., Inc., 45 Arctic St., Worcester, Mass.

Green Mountain Handy Hydrate
Snow Fluff Agricultural Hydrate

Conklin Limestone Co., Inc., Canaan, Conn.

High Magnesium Agricultural Ground Limestone

Limestone Products Corporation of America, Newton, N. J.

Lime Crest Brand Calcite Hydrated Lime for Agricultural Use

Solvay Process Co., Syracuse 1, N. Y.

Solvay Pulverized Limestone

United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.

Red Top Hydrate Lime — Genoa, Ohio

Explanation of Table of Analyses

Tables I, II, III, "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass or be retained by the meshed sieves mentioned.

The limestone products have been published in two groups or grades (see tables II and III) according to fineness of grinding and to conform to definitions voted by the Association of Official Agricultural Chemists at their 1936 meeting.

Table I. Hydrated or Slaked Lime

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	
Eastern States Farmers' Exchange, West Springfield, Mass.							
Eastern States Agricultural Hydrated Lime	49.0	47.0	33.0	31.0	93.1	1862	2.7
A. H. Hoffman, Inc., Landisville, Penn.							
Hoffman's Hydrated Lime	67.2	70.0	2.6	1.0	68.4	1368	4.7
Hooaac Valley Lime Co., Inc., Adams, Mass.							
Adams Land Lime	58.1	60.0	2.2	.5	57.9	1158	7.9
Lee Lime Corporation, Lee, Mass.							
Lee Double Strength Agricultural Hydrated Lime	48.1	46.0	32.5	31.0	90.8	1816	2.1
Tobey Agra Hydrate	41.8	35.0	28.2	25.0	80.0	1600	.9
New England Lime Co., Adams, Mass.							
Nelco Agricultural Hydrated Lime (Adams)	72.6	70.0	1.7	5	72.2	1444	5.4
Nelco Agricultural Hydrated Lime (Canaan, Conn.)	46.5	47.0	32.0	31.0	89.9	1798	1.9
Nelco Land Lime (Canaan, Conn.)	41.8	35.0	28.6	25.0	79.0	1580	3.5
United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.							
Red Top Hydrate Lime (Farnams, Mass.)	70.3	70.0	2.2	trace	69.8	1396	4.3
USG Hydrated Lime for Agricultural Use (Farnams, Mass.)	72.4	70.0	1.9	trace	72.1	1442	4.5

Table II. Pulverized Limestone (Fine-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Goulard & Olena, Inc., 140 Liberty St., New York, N. Y. Agricultural Limestone	28.0	28.97	15.6	20.42	48.1	96.2	18.7	88.2	none
Hoosac Valley Lime Co., Inc., Adams, Mass. Hoosac Agricultural Limestone	54.4	51.5	5	.5	54.6	109.2	2.4	85.2	5
Lee Lime Corporation, Lee, Mass. Tobey Pulverized Limestone	35.5	35.0	13.5	7.0	52.8	105.6	9.0	93.5	none
Limestone Products Corporation of America, Newton, N. J. Lime Crest Brand Calcite Pulverized	42.7	42.0	7.9	2.0	52.1	104.2	8.4	88.3	3
D. U. Smith & Bro., Ashley Falls, Mass. Ashley White Dolomite Agricultural Limestone	30.9	30.0	20.7	21.0	58.1	116.2	3.0	87.4	none
United States Gypsum Co., 300 West Adams St., Chicago 6, Ill. USG Agricultural Limestone (Farnams, Mass.)	53.3	50.5	1.7	.25	54.3	108.6	1.3	83.1	none

Table III. Ground Limestone (Coarse-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaran- teed	Found	Guaran- teed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Grangers Manufacturing Co., 53 State St., Boston, Mass. Grangers Agricultural Limestone	42.7	34.0	6.2	5.0	50.5	1010	11.9	66.6	none
Hoosac Valley Lime Co., Inc., Adams, Mass. Hoosac Agricultural Limestone	44.4	51.5	.6	.5	41.5	890	20.6	37.5	6
Hoosac Agricultural Limestone	51.6	51.5	.6	.5	52.2	1044	6.4	44.1	1.4
Lee Lime Corporation, Lee, Mass. Lee Pulverized Limestone	31.5	30.0	21.3	20.0	59.7	1194	.7	50.4	3
Clifford L. Miller, West Stockbridge, Mass. Monarque Pulverized Limestone	47.6	39.0	5.1	11.0	53.2	1084	5.0	58.0	8
New England Lime Co., Adams, Mass. Nelco Agricultural Ground Limestone (Canaan, Conn.)	32.6	30.0	22.5	21.0	62.0	1240	1.3	71.0	.3
United States Gypsum Co., 300 West Adams St., Chicago 6, Ill. USG Agricultural Limestone (Farmans, Mass.)	32.6	30.0	20.2	20.0	59.4	1188	1.6	46.5	none

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1945**

Acme Guano Co., 411 National Marine Bank Bldg., Baltimore 2, Md.
 Agricultural Laboratories, Inc., 1145 Chesapeake Ave., Columbus, Ohio
 Allied Chemical & Dye Corporation, The Barrett Division, 40 Rector St., New York 6, N. Y.
 American Agricultural Chemical Co., 255 River St., North Weymouth, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd & St. Clair Sts., Marietta, Ohio
 American Potash & Chemical Corporation, 122 East 42nd St., New York 17, N. Y.
 Apothecaries Hall Co., Waterbury 88, Conn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., 601 Trust Company of Georgia Bldg., Atlanta, Ga.
 Atkins & Durbrow, Inc., 165 John St., New York 7, N. Y.
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport 5, Conn.
 Joseph Breck & Sons Corporation, 85 State St., Boston, Mass.
 Buell Fertilizer Co., Exeter, N. H.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Davison Chemical Corp., 20 Hopkins Place, Baltimore, Md.
 E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.
 Eastern States Farmers' Exchange, 95 Elm St., West Springfield, Mass.
 Essex County Co-operative Farming Association, South Main St., Topsfield, Mass.
 Excell Laboratories, 2625 Indiana Ave., Chicago, Ill.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Glendale Poultry Farm, Somerset, Mass.
 Goulard & Olena, Inc., 140 Liberty St., New York, N. Y.
 Gasale Co., Wilmington, Mass.
 A. H. Hoffman, Inc., Landisville, Penn.
 Humphreys-Godwin Co., Memphis 3, Tenn.
 Hydroponic Chemical Co., Inc., 315 West 39th St., New York 18, N. Y.
 Hy-Trous Corporation, 131 State St., Boston, Mass.
 International Minerals & Chemical Corporation, Woburn, Mass.
 L. B. Lovitt & Co., Memphis, Tenn.
 McCormick & Co., Inc., 414 Light St., Baltimore 2, Md.
 Norwood Brand Fertilizer Co., Mt. Vernon St., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 Plantabbs Co., 1 W. Biddle St., Baltimore 1, Md.
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago 9, Ill.
 Ramshorn Mills, Inc., West Millbury, Mass.
 Ra-Pid-Gro Corporation, Dansville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 William H. Rorer, Inc., Drexel Bldg., Independence Square, Philadelphia, Penn.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck and Co., 925 S. Homan Ave., Chicago 7, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
 M. L. Shoemaker Division of Wilson & Co., Inc., Venango St. and Delaware Ave., Philadelphia, Penn.
 Stockdale Fertilizer Co., Morris, Ill.
 Swift & Co., Plant Food Division, 910 Court Square Bldg., Baltimore 2, Md.
 Tennessee Corporation, Lockland, Ohio
 Walker-Gordon Laboratory Co., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro, Mass.
 Woodruff Fertilizer Works, Inc., North Haven Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 127

DECEMBER 1945

Seed Inspection

By F. A. McLaughlin

This report, the eighteenth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1945, by authority of Chapter 94 as amended by Chapter 288 of the Acts of 1937 and Chapter 363 of the Acts of 1938.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

ANNOUNCEMENT

The seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any resident firm or citizen of Massachusetts.

Units are rated as follows:	Units
Purity analysis (red clover, timothy, etc.)	1
Purity analysis (bluegrass, orchard grass, etc.)	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture)	4-10
Examination for noxious weeds (sample of 4 oz. or less)	2
Identification of seed or plant	1
Cleaning tobacco seed (4 oz. or less)	2
Germination test (4 x 100 seeds of any seed not chaffy or requiring purity analysis)	1
Germination test (soil, 2 x 100 seeds)	1
Germination test (chaffy grasses or seeds requiring purity analysis)	2

Fees for work in excess of the ten free units allowed to a citizen or resident firm of Massachusetts are as follows:

Germination test of all crop seeds except grasses	\$0.25
Germination test of timothy	.25
Germination test of all other grasses	.50
Purity analysis of cereals	.50
Purity analysis of timothy	.75
Purity analysis of all other grasses	1.00
Purity analysis of all other crop seeds	.75
Purity analysis of mixtures of not more than 2 kinds of agricultural seeds	1.00
Purity analysis of special mixtures, including lawn grasses and pasture mixtures — a charge sufficient to cover the actual cost of working the sample, depending entirely upon the character of the sample.	
Minimum charge	1.25

In no case will the final report be rendered until all fees are paid.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any one kind to be submitted for a germination test is 400.

SEED INSPECTION

By F. A. McLaughlin¹

MASSACHUSETTS VEGETABLE SEED STANDARDS FOR 1946

Section 261D of the Seed Law requires that a set of standards for germination of vegetable seeds be determined each year by the Director of the Massachusetts Agricultural Experiment Station and approved by the Commissioner of Agriculture. The following set of standards for 1946 has been so determined and approved.

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>)	60	Kale	75
Asparagus	*70	Kohlrabi	75
Beans:		Leek	60
Limas	70	Lettuce	80
Scarlet Runner	75	Muskmelon	75
Other Varieties	75	Mustard	75
Beets	65	Okra	*50
Broccoli	75	Onion	70
Brussels Sprouts	70	Parsley	60
Cabbage	75	Parsnip	60
Carrots	55	Peas	80
Cauliflower	75	Pepper	55
Celeriac	55	Pumpkin	75
Celery	55	Radish	75
Chard, Swiss	65	Rhubarb	60
Chicory	65	Rutabaga	75
Chinese Cabbage	75	Salsify	75
Citron	65	Sorrel	60
Collard	80	Soybean	75
Corn, Sweet	75	Spinach:	
**Cress, Garden	40	Common	60
Cress, Water	35	New Zealand	40
Cucumber	80	Squash	75
Dandelion	45	Tomato	75
Egg Plant	60	Tomato, Husk	50
Endive	70	Turnip	80
Fetticus (Corn Salad)	70	Watermelon	70

*Including Hard Seeds.

**Garden Cress (*Lepidium sativum*) is also called Pepper Grass and Curled Cress. Should not be confused with Upland Cress or Spring Cress (*Campeyerna*) for which no standard has been adopted.

The above set of standards is identical with the one adopted by the United States Department of Agriculture for administration of the Federal Seed Act.

¹Assisted by Miss Jessie L. Anderson, Research Assistant; Mrs. Phyllis Russell, Laboratory Assistant from March to September, 1945; and Miss May J. Honnay, Clerk.

1945 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1944 to November 1, 1945, the Seed Laboratory received 4426 samples of seed, of which 1245 were collected by the State Department of Agriculture and 3181 were sent in by seedsmen, farmers and various state institutions. An additional lot of 260 samples of flower seeds, for field tests only was received from the State Commissioner of Agriculture.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 4426 samples was 5291; 449 for purity and 4842 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
357 Field Crops for Purity and Germination.....	357	357
236 Field Crops for Germination Only.....		236
30 Lawn Mixtures for Germination Only, Germinations involving 137 ingredients..		137
74 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 401 ingredients	74	401
18 Lawn Mixtures for Purity Only.....	18	.....
3613 Vegetables for Germination Only.....		3613
7 Tree Seeds for Germination Only.....		7
72 Tobacco Seeds for Germination.....		72
19 Flower Seeds for Germination Only.....		19
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4426	449	4842

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested 382 samples of vegetable seeds, and 260 samples of flower seeds, respectively.

The Seed Laboratory cleaned 60 lots of tobacco seed and 19 lots of onion seed for Connecticut Valley farmers. The gross weight of the tobacco seed was 48.25 pounds and the net weight for the cleaned seed was 40.15 pounds. Onion seed received had a gross weight of 1056.75 pounds which was cleaned to a net weight of 453.20.

Explanation of Tables

Each of the following tables contains seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. The samples were taken by an inspector from the State Department of Agriculture and worked at the Seed Laboratory. Section 261A of the Acts and Resolves of 1937 and 1938, Chapters 288 and 363, defines the group from Alfalfa to Wheat, inclusive; Section 261 B, Mixtures; Section 261C, Special Mixtures; and Section 261D, Vegetables.

The last table is a summary, by wholesalers, of the total number of samples tested under each of the above four sections and the number of samples found to be mislabeled.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement.

Mislabeling and other irregularities are emphasized in the tables by boldface type and explained in the final column of the table or in footnotes.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

"Tolerance" is applied to both purity and germination, except for vegetable seed found below the minimum germination standards adopted, in which instance no tolerance is allowed. "Germination Tolerance" has been applied between a given germination and the result of the germination test as follows:

GIVEN GERMINATION PERCENT	TOLERANCE PERCENT
96 or over.....	5
90 or over, but less than 96..	6
80 or over, but less than 90..	7
70 or over, but less than 80..	8
60 or over, but less than 70..	9
Less than 60.....	10

In the determination of the tolerance for the percentage of the distinguishable kind, type, or variety (pure seed), weed seeds, other crops seed, and inert matter, the sample shall be first considered as made up of two parts: (a) The percentage of the component (pure seed, weed seed, crop seed or inert matter as the case may be) being considered, and (b) the difference between that percentage and 100. The number represented by (a) is then multiplied by the number represented by (b) and the product is divided by 100. The resulting number is then multiplied by 0.2 (2/10) and the resulting product added to 0.2 or 0.6 as indicated in the following formulae:

$$\text{Pure seed tolerance} = 0.6 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

$$\text{Weed seeds, other crop seeds, and} \\ \text{inert matter tolerance} = 0.2 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

For *Poa* spp., *Agrostis* spp., *Festuca* spp., bromegrass, crested wheatgrass, orchard grass, velvet grass, tall oatgrass, meadow foxtail, sweet vernalgrass, Rhodes grass, Dallis grass, carpet grass, and Bermuda grass, and mixtures containing these seeds singly or combined in excess of 50 percent, an additional tolerance shall be allowed. This is to be obtained by adding to the regular tolerance mentioned above the product obtained by multiplying the regular tolerance by the lesser of "a" and "b" divided by 100.

Results of Inspection and Analyses of Field Seeds — Section 261A

Each lot of Agricultural Seeds must be labeled to show the name and variety; approximate percentage, by weight, of purity; approximate total percentage, by weight, of weed seeds; name and approximate number per ounce of each kind of noxious weed seeds present, singly or collectively, as follows: (1) in excess of one seed in each five grams of grasses, alfalfa and clovers; (2) in excess of one seed in each twenty-five grams of millets, rape and other seeds of similar size; (3) in excess of one seed in each hundred grams of wheat, oats, rye, and other seeds as large or larger than wheat; the approximate percentage of germination of such agricultural seed, and the month and year such seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Two hundred and forty-eight samples of field crop seeds were sampled and analyzed in the laboratory. Results of analyses, however, are given only for samples which were mislabeled. In this table complete analysis is recorded, but mislabeling, indicated by boldface type, is applied only to the items named above. Where evidence shows that seed was purchased by the retailer in a previous season and again offered for sale during the current season, without having been retested, the name of wholesaler is withheld, and such samples are recorded under "Wholesaler Unknown." Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1023	Clover	Apothecaries Hall Co., Waterbury, Conn. Middlesex Co., Farm Bureau, Waltham Medium Red, No. 15 x 564	L 99.00 F 98.68	0.74 0.63	0.14 0.39	0.12 0.24	82-10 82-11	3 1945 8 1945	27 English Plantain per oz. 93 English Plantain per oz. found.
1027	Orchard Grass	No. 33-59	L 85.64 F 84.45	1.70 1.16	13.01 14.34	0.05 0.05	88.0 96.00	1/1945 7 1945	Noxious weeds not declared, but 14 English Plantain per oz. found.
948	Oats	Barber & Bennett, Inc., Albany, N. Y. Stanley's Coal, Grain, Mason & Bldg. Supplies, Adams *Fancy Canadian Victory Type	L 98.30 F 98.23	0.20 0.23	0.30 0.05	1.20 1.49	88.00 94.00	3 1945 6 1945	*Variety or "Type" Unknown" required; "Type" not satisfactory.
944	Clover	The Belt Seed Co., Syracuse, N. Y. Hoosac Valley Coal & Grain Co., Adams Red, No. 924	L 99.25 F 99.12	0.15 0.09	0.20 0.26	0.30 0.53	76-14 66-9	3/1945 8/1945	Germination below that stated.

997	Clover	Joseph Breck & Sons, Boston, Mass. Ladino, No. 84-15.....	L 99.48 F 99.72	0.10 0.12	0.23 0.16	0.19 —	80-10 88-8	2, 1945 8/1945	Noxious weeds not declared, but 32 English Plantain per oz. found.
1375	Mangel	Crolek Hardware Co., Ipswich Breck's Mammoth Long Red.....	L * F 99.64	—	—	—	96.00 68.00	* * 8/1945	*Required information not given. Germination below that stated.
S-67	Rye	Northampton State Hospital, Northampton *Spring, No. 142-13.....	L 98.21 F 98.14	0.03 0.06	1.12 1.04	0.64 0.76	80.00 75.00	12, 1944 4, 1945	*Variety required; "Spring" is not a variety.
1130	Clover	Arthur R. Conc, Buffalo, N. Y. Essex County Co-operative Farming Assoc., Topshfield Ladino, No. 35-12.....	L 99.70 F 99.80	0.20 0.08	0.05 0.07	0.05 0.05	79-13 55-43	2, 1945 8/1945	Germination below that stated.
1122	Fescue	Chewing's, No. 36-15.....	L 89.17 F 78.76	0.06 0.04	10.60 20.94	0.17 0.26	90.00 89.00	3, 1945 7/1945	Purity below that stated.
1225	Corn	Farm Service Store, Lowell Westbranch Sweepstakes, No. 80 x 14.....	L 99.50 F 99.90	—	—	—	90.00 78.00	2, 1945 7/1945	Germination below that stated.
1223	Millet	Golden, No. 90-28.....	L 97.00 F 96.79	1.90 2.92	0.72 0.17	0.38 0.12	85.00 90.00	3, 1945 8/1945	Weed seed excessive.
291	Clover	Farm Service Store, Middleboro Alsike, No. 25 x 418.....	L 97.74 F 94.51	0.45 1.44	0.45 0.44	1.36 3.61	78-14 74-16	1/1945 5/1945	Purity below that stated. Weed seed excessive.
292	Clover	Medium Red, No. 15 x 544 Farm Service Store, No. Abington Kentucky, No. 34-101.....	L 99.16 F 98.98	0.43 0.67	0.29 0.17	0.12 0.18	77-14 79-13	1, 1945 5, 1945	52 English Plantain per oz. 87 English Plantain per oz. found.
1121	Bluegrass	Farmers Feed & Supply Co., Amesbury Medium Red, No. 15-561.....	L 85.90 F 85.60	0.10 0.63	13.90 13.73	0.10 0.04	80.00 68.00	10, 1944 7, 1945	Weed seed excessive. Germination below that stated.
1198	Clover	Hungarian, 90-21.....	L 99.30 F 97.98	0.20 0.64	0.20 0.41	0.30 0.97	82-10 86-9	3, 1945 8, 1945	Noxious weeds not declared, but 41 English Plantain and 2 Dodder per oz. found. Purity below that stated. Weed seed excessive.
1203	Millet	*Black Wilson Type.....	L 98.75 F 98.95	—	—	—	85.00 86.00 93.00	2, 1945 1/1945 7, 1945	Weed seed excessive. *Variety required; "Type" not satisfactory.
911	Clover	Haley's Grain Store, Palmer Medium Red, No. 15-553.....	L 99.50 F 99.23	0.10 0.29	0.25 0.17	0.15 0.31	82-15 88-7	3, 1945 8, 1945	Noxious weeds not declared, but 36 English Plantain per oz. found.

Results of Inspection and Analyses of Field Seeds — Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
Arthur R. Cone, (Continued)									
Haley's Grain Store, (Continued)									
912	Millet	Japanese, No. 90-26.....	L 98.70 F 97.66	1.10 2.17	0.06 0.17	0.14 —	85.00 88.00	3 1945 7 1945	Purity below that stated. Weed seed excessive.
284	Clover	Sunshine Feed Store, Bridgewater Alsike, No. 25 x 425.....	L 99.12 F 97.90	0.20 0.96	0.40 0.34	0.28 0.80	61.29 95.3	1 1945 5 1945	Purity below that stated. Weed seed excessive.
282	Clover	Medium Red, No. 15 x 560	L 99.15 F 99.61	0.30 0.30	0.20 0.07	0.35 0.02	78.14 90.8	3 1945 5 1945	Noxious weeds not declared, but 75 English Plantain and 1 Dodder per oz. found.
281	Rye	*Spring, No. 56-13.....	L 98.49 F 99.55	0.05 0.00	1.25 0.12	0.21 0.33	90.00 92.00	3 1945 5 1945	*Variety required; "Spring" is not a variety.
811	Alfalfa	Sunshine Feed Store, Greenfield No. 28 x 391.....	L 99.15 F 97.18	0.15 2.12	0.55 0.70	0.15 —	77.14 70.10	3 1945 8/1945	Purity below that stated. Weed seed excessive.
813	Clover	Medium Red, No. 15 x 560	L 99.15 F 99.89	0.30 0.07	0.20 —	0.35 0.04	78.14 85.12	3 1945 8 1945	Noxious weeds not declared, but 40 English Plantain and 1 Dodder per oz. found.
812	Timothy	No. 10 x 588..	L 99.60 F 98.65	0.11 1.05	0.15 0.10	0.14 0.20	90.00 84.00	2/1945 6/1945	Purity below that stated. Weed seed excessive.
S-75	Mangel	Wrentham State School, Wrentham Wurzel, Golden Tankard.....	L * F 99.86	— —	— 0.14	— —	80.00 66.00	1/1945 4 1945	*Purity required but not stated. Germination below that stated.
1012	Bluegrass	Purycia Seed Co., Inc., New York, N. Y. New England Toro Co., West Newton Kentucky, No. 25-119.....	L 85.00 F 83.59	0.56 0.68	14.40 15.63	0.04 0.10	80.00 85.00	3 1945 7 1945	Noxious weeds not declared, but 63 English Plantain per oz. found.
891	Alfalfa	Harry Seder, Webster No. 15-55.....	L 99.50 F 99.60	0.22 0.24	0.28 0.16	— —	70.21 53.36	1/1945 6/1945	Germination below that stated.

Eastern States Farmers' Exchange, Springfield, Mass.

Eastern States Farmers' Exchange, Springfield, Mass.
 *Selected, No. 572.....

1100 Buckwheat
 1101 Buckwheat
 1103 Clover

*Selected, No. 434.
 Ladino, No. 407.....

1083 Bent

Engbreton Seed Co., Astoria, Oregon
 New England Toro Co., West Newton
 Astoria (Red Tag), No. AB 427.....

991 Corn
 986 Wheat

Thomas J. Grey Co., Boston, Mass.
 West Branch Sweepstakes No. 72-336.

1185 Timothy
 1218 Barley

Marquis, Spring, No. 75-210.....

521 Corn
 523 Timothy
 905 Clover

Charles C. Hart Seed Co., Wethersfield, Conn.
 Ricard Grain Co., New Bedford
 Timothy.....

The Page Seed Co., Greene, N. Y.
 C. J. Howland, North Brookfield
 Hungarian No. 16572.....

F. H. Sargent & Son, Campello
 *Barley.....

557 Millet
 497 Millet

D. Landreth Seed Co., Bristol, Pa.
 Mackenzie & Winslow, Inc., Fall River
 Lancaster County Sure Crop, No. BB 461

Millis Coal & Grain Co., Inc., Millis
 Hungarian, No. 16572.....

No. BB 62.....
 Yankee Maid Products, Inc., Boston
 White Dutch No. 44,461.....

1083 Clover

The Page Seed Co., Greene, N. Y.
 C. J. Howland, North Brookfield
 Hungarian No. 16572.....

1083 Clover

L	99.00	0.10	0.55	0.35	90.00	5, 1945	*Variety required but not stated; appears to be Silverhull.
F	98.31	0.15	0.99	0.55	92.00	7, 1945	
L	99.00	0.10	0.55	0.35	90.00	3, 1945	*Variety required but not stated; appears to be Silverhull.
F	99.53	—	0.47	—	94.00	7/1945	
L	99.50	0.12	0.38	Trace	81-12	2, 1945	Noxious weeds not declared, but 30 English Plantain per oz. found.
F	99.48	0.25	0.22	0.05	86-4	8, 1945	
L	97.57	0.21	2.13	0.09	*	* * *	*Required information not given.
F	97.40	0.19	2.32	0.09	93.00	7, 1945	

L	99.50	—	0.50	—	90.00	2, 1945	Germination below that stated.
F	99.73	—	0.27	—	55.00	6, 1945	
L	99.50	0.13	0.37	—	90.00	1, 1945	Germination below that stated.
F	98.90	—	1.10	—	40.00	8, 1945	
L	99.79	Trace	0.17	0.04	93.00	* * *	*Required information not given.
F	99.65	0.05	0.30	—	93.00	8, 1945	
L	99.00	—	—	—	90.00	* 1945	*Required information not given.
F	99.15	0.04	0.18	0.63	98.00	7, 1945	

L	99.00	—	1.00	—	90.00	3, 1945	Germination below that stated.
F	99.92	—	0.08	—	74.00	6, 1945	
L	99.60	0.10	0.20	0.10	90.00	1, 1945	Germination below that stated.
F	99.69	0.13	0.09	0.09	68.00	6, 1945	
L	98.15	0.05	0.10	1.70	77-15	2, 1945	Purity below that stated. Weed seed excessive.
F	94.96	4.91	—	0.13	88-5	7, 1945	

L	99.00	0.05	0.50	0.15	90.00	3, 1945	Weed Seed excessive.
F	98.97	0.83	0.20	—	93.00	7, 1945	
L	99.00	0.05	0.50	0.15	App.	3, 1945	Weed Seed excessive.
F	98.22	1.63	0.10	0.06	95.00	7, 1945	

Results of Inspection and Analyses of Field Seeds — Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
347	Barley	W. M. Scarlett & Co., Baltimore, Md. C. P. Washburn Co., Middleboro *Spring, No. 27312, Wisconsin No. 3 Type.....	L 98.00 F 98.90	0.50 0.20	1.50 0.25	— 0.65	90.00 90.00	3/1945 6/1945	*Variety required; "Spring" is not a variety; "Type" not satisfactory.
S-58	Clover	Worcester State Hospital, Worcester Alsike, No. 7347.....	L 98.00 F 97.84	0.80 0.60	0.20 0.24	1.00 1.32	75-15 60-35	3/1945 4/1945	Noxious weeds not declared, but 9 English Plantain per oz. found. Germination below that stated.
S 57	Millet	Japanese, No. 27215.....	L 97.00 F 98.14	2.20 1.33	0.80 0.53	— —	80.00 80.00	3/1945 4/1945	Noxious weeds not declared, but 5 Wild Mustard per oz. found.
416	Bluegrass	Sears, Roebuck & Co., Chicago, Ill. Sears, Roebuck & Co., Norwood Kentucky, No. O. K. 233.....	L 87.69 F 75.38	0.25 0.26	12.06 23.16	— 1.20	80.00 73.00	1/1945 6/1945	Purity below that stated.
558	Corn	The Stanford Seed Co., Buffalo, N. Y. C. H. Howland, North Brookfield C. P. Special Variety Unknown No. 1267.....	L 99.00 F 99.81	— —	1.00 0.19	— —	85.00 65.00	3/1945 6/1945	Germination below that stated.
931	Redtop	W. N. Potter Grain Store, No. Adams No. 3409.....	L 97.37 F 96.61	0.65 0.60	1.98 2.77	— 0.02	90.00 68.00	1/1945 7/1945	Germination below that stated.
969	Clover	W. N. Potter Grain Store, Shelburne Falls Ladino, No. 3844.....	L 98.57 F 99.41	0.12 0.10	0.90 0.44	0.41 0.05	65-27 86-9	1/1945 6/1945	Noxious weeds not declared, but 11 English Plantain per oz. found.
1127	Alfalfa	Whitney Seed Co., Buffalo, N. Y. Essex County Co-operative Farming Assoc., Topsfield Common, No. 20511.....	L 99.14 F 99.10	0.36 0.25	0.34 0.54	0.16 0.11	78-13 67-12	3/1945 8/1945	Germination below that stated.
1128	Alfalfa	Canadian Grimm, No. 21526.....	L 98.00 F 98.28	1.50 0.95	0.27 0.14	0.23 0.63	81-11 69-14	3/1945 8/1945	Germination below that stated.
1215	Clover	W. K. Gilmore & Sons, Inc., Walpole Alsike No. 15511.....	L 98.30 F 97.52	0.30 1.38	0.10 0.10	1.30 0.10	78-15 85-9	3/1945 8/1945	Weed Seed Excessive.

406	Redtop	Fancy, No. 40511.....	L 94.42 F 92.00	0.48 0.42	5.10 7.47	— 0.11	92.00 88.00	3/1945 8/1945	Purity below that stated.
994	Bluegrass	S. S. Kresge Co., Boston Kentucky, No. P. 3600.....	L 85.00 F 83.06	0.30 0.38	14.60 16.52	0.10 0.04	80.00 70.00	1/1945 7/1945	Germination below that stated.
853	Clover	The Manchester Forbes Co., Easthampton White, No. P. 6163.....	L 97.00 F 90.87	0.70 8.77	0.15 0.32	2.15 0.04	80-12 92.3	4/1945 6/1945	Noxious weeds not declared, but 54 English Plantain per oz. found. Purity below that stated. Weed seed excessive. NOTE: We find 8.32% Storking Clover Seed. This is a weed in Mass. and not con- sidered "Other Crop Seed."
1089	Buckwheat	Middlesex County Farm Bureau, Waltham *No. 81112.....	L 99.00 F 99.80	0.05 —	0.95 0.20	—	86.00 99.00	5/1945 7/1945	*Variety required but not stated. Found to be Japanese Buckwheat.
1024	Clover	Ladino, No. 56417.....	L 99.48 F 99.70	0.10 0.15	0.42 0.15	—	80-10 87-9	3/1945 8/1945	Noxious weeds not declared, but 22 English Plantain per oz. found.
965	Corn	H. Newell & Co., Shelburne Falls Excelsior Ensilage, No. 70367.....	L 99.50 F 99.84	— —	0.50 0.06	—	90.00 79.00	3/1945 7/1945	Germination below that stated.
914	Corn	E. J. O'Donnell, Florence Certified Cornell 29-3, No. 70348..	L 99.50 F 99.91	— —	0.50 0.09	—	* 89.00	3/1945 6/1945	*Germination required but not stated.
1085	Bent Grass	F. H. Woodruff & Sons, Milford, Conn. New England Toro Co., West Newton Colonial—Certified B. T. Astoria, No. 99-207..	L 99.00 F 99.30	— 0.03	1.00 0.67	—	90.00 82.00	2/1945 8/1945	Labeled "Certified B. T. Astoria"; found to be Highland Bent. Germination below that stated.
1232	Mangel	S. D. Woodruff & Sons, Orange, Conn. Cover Grain & Feed Co., Lowell Mammoth Long Red, No. 2861....	L * F 99.93	— —	— 0.07	—	App. 85.00 81.00	1/1945 8/1945	*Purity required but not stated.
1032	Buckwheat	Framingham Farmers' Cooperative Exchange, Inc., Framingham Japanese, No. 4158.....	L 99.50 F 99.79	0.01 —	0.23 0.18	0.26 0.03	93.00 81.00	1/1945 7/1945	Germination below that stated.
1034	Millet	Hungarian, No. 4154..	L 99.80 F 99.17	0.10 0.71	0.10 0.12	—	81.00 78.00	1/1945 8/1945	Weed seed excessive.
1035	Orchard Grass	Orchard Grass.....	L 88.28 F 89.32	0.60 0.39	11.08 10.09	0.04 0.20	88.00 92.00	1/1945 7/1945	Noxious weeds not declared, but 60 English Plantain and 1 Dodder per oz. found.
S-56	Clover	Worcester State Hospital, Worcester Ladino.....	L 99.86 F 99.70	— 0.05	0.14 0.20	— 0.05	* 92.5	2/1945 4/1945	*Germination required but not stated.

Results of Inspection and Analyses of Mixtures — Section 261B

Each Mixture of Agricultural Seeds which contains not more than two kinds, each of which is present in excess of five percent by weight, must be labeled to show that such seed is a mixture; the name, variety and approximate percentage by weight of each kind present in excess of five percent by weight of the total mixture; approximate total percentage by weight of weed seeds; name and approximate number per ounce of noxious weed seeds present singly or collectively in excess of one seed in each fifteen grams of such mixture; the approximate percentage of germination of each kind of agricultural seed present in excess of five percent by weight, together with the month and year such seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), doddler species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.), and English plantain (*Plantago lanceolata*).

Complete analysis is given, but mislabeling, which is indicated by boldface type, is applied only to the items named above.

The name and address of the wholesaler are printed in boldface type, which is indicated by boldface type.

One sample only was received under this section.

Lab No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesaler, Distributor, and Place Collected	Ingredients		Germination		Pure Seed	Weed Seed	Inert Matter	Other Crop Seed	Date of Test	Remarks
		Label	Found	Label	Found						
496	The Page Seed Co., Greene, N. Y. Mills Coal & Grain Co., Mills *Silverhull Buckwheat					L 99.95		0.05		2 1945	*Labeled "Silverhull Buckwheat" but found to be a mixture of Silverhull and Kangra Buckwheat
						F 99.92	0.01	0.07		6 1945	
	Ingredients:										
	Silverhull Buckwheat	99.95	87.35	App.	97.00						
	Kangra Buckwheat		12.57		90.00						

Results of Inspection and Analyses of Mixtures — Section 261C

Each Mixture of Agricultural Seeds, except as specified in Section 261B, shall be labeled to show that such seed is a mixture; the name, variety and approximate percentage by weight of each kind present in excess of five percent or more by weight of the total mixture; approximate total percentage by weight of weed seeds; the approximate percentage of germination of each kind present in excess of five percent by weight, together with the month and year said seed was tested; the approximate percentage by weight of inert matter; the name and approximate number per ounce of noxious weed seeds present singly or collectively in excess of one seed in each fifteen grams of such mixture; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Complete analysis is given, but mislabeling, which is indicated by boldface type, is applied only to the items named above.

The name and address of the Wholesaler are printed in boldface type.

Forty-five mixtures under this section were received but only twenty-nine, for which analysis does not conform with labeled information, are shown in this table.

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distribution, and Place Collected	Ingredients		Germination		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
956	Associated Seed Growers, Inc., Milford, Conn. C. H. Phillips General Store, Williamstown Easy Gro Lawn Mixture No. 753					L F	0.31 0.54	5.50 4.67	0.41 0.41	1-1945 6-1945	
	Ingredients:										
	Kentucky Bluegrass	12.18	11.31	80.00	76.00						
	Redtop	37.20	45.22	90.00	89.00						Exceeds percentage stated.
	White Clover	1.68	2.17	72-19	71-22						
	Common Ryegrass	42.72	35.68	90.00	90.00						Percentage below that stated.

Results of Inspection and Analyses of Mixtures - Section 261C - Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients		Germination		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
360	Joseph Breck & Sons, Boston, Mass. Centre Hardware Co., Koshlandale Breck's Shady Spot Lawn Grass Seed Mixture.....					L	Not Over 0.50	2.75	—	3/1945	
	Ingredients:					F	0.72	3.27	0.24	5/1945	Percentage below that stated.
	Kentucky Bluegrass.....	32.62	18.56	85.00	85.00						
	Redtop, Fancy.....	29.53	—	90.00	—						
	Chewings Fescue.....	29.20	31.92	90.00	92.00						
	Colonial Bent.....	5.82	—	90.00	—						
	Agrostis spp. (Redtop and Colonial Bent)	—	45.2	—	95.00						
1067	Lawrence Bros., Falmouth No. 9 Grass Seed Mixture.....					L	Not Over 1.00	5.00	—	3/1945	
	Ingredients:					F	0.55	5.22	—	7/1945	Exceeds percentage stated.
	Kentucky Bluegrass.....	4.29	9.08	80.00	82.00						
	Chewings Fescue.....	—	8.36	90.00	90.00						Exceeds percentage stated. Found but not declared.
	Alsike Clover.....	4.70	3.07	79-12	71-27						Percentage below that stated.
	Redtop (Choice Cl).....	4.65	10.43	90.00	93.00						Exceeds percentage stated.
	Timothy.....	26.28	14.64	90.00	92.00						Percentage below that stated.
	Red Clover.....	8.95	6.74	80-10	77-4						
	Meadow Fescue.....	4.30	9.28	85.00	97.00						Exceeds percentage stated.
	Common Ryegrass.....	17.50	9.00	90.00	94.00						Percentage below that stated.
	Perennial Ryegrass.....	13.21	10.57	90.00	93.00						Percentage below that stated.
	Orchard Grass.....	11.35	7.96	85.00	90.00						Exceeds percentage stated.
	Mammoth Ladino White Clover.....	2.40	5.10	75-15	87-6						
428	The Welch Company, Inc., Scituate Breck's Boston Park Lawn Grass Seed.....					L	Not Over 0.50	1.72	—	3/1945	
	Ingredients:					F	1.01	0.03	0.03	6/1945	Weed Seed excessive.
	Kentucky Bluegrass.....	29.52	36.98	80.00	88.00						Exceeds percentage stated.
	Redtop, Fancy.....	34.36	—	90.00	—						
	Chewings Fescue.....	19.54	15.41	90.00	93.00						
	Colonial Bent.....	4.43	—	90.00	—						
	Domestic Ryegrass.....	9.36	12.73	90.00	91.00						Exceeds percentage stated.
	Agrostis spp. (Redtop, Highland & Colonial Bents)	—	32.12	—	93.00						

Constock, Ferre & Co., Wethersfield, Conn.
Weld & Beck, Southbridge
Special Lawn Green Mixture, No. 415

886

Ingredients:								
Kentucky Bluegrass	32.66							
Redtop	21.53							
White Dutch Clover	4.98							
Chewings Fescue	7.86							
Domestic Ryegrass	24.81							
Astoria Bent	3.93							
Agrostis spp. (Redtop & Astoria Bent)	25.04							
	36.88	80.00						
	—	90.00						
	—	89.9						
	2.63	86.00						
	—	90.00						
	—	85.00						
	—	95.00						

Percentage below that stated.

Arthur R. Cone, Buffalo, N. Y.
Farm Service Div., General Mills, Inc., Waltham
Anchor Lawn Seed Mixture

1020

Ingredients:								
Kentucky Bluegrass	28.00	30.25	80.00					
Redtop	30.36	30.40	90.00					
Timothy	9.90	7.35	90.00					
White Clover	5.04	4.29	75-15					
Domestic Ryegrass	15.84	17.03	92.00					
			65.00					
			90.00					
			81.00					
			69-18					
			96.00					

Germination below that stated.

Farmers Feed & Supply Co., Amesbury
Facemaker Lawn Seed

1202

Ingredients:								
Kentucky Bluegrass	*	8.00	*	85.00				
Redtop	*	36.04	*	37.00				
Timothy	*	34.79	*	83.00				
White Clover	—	1.58	—	56-40				
Common Ryegrass	*	16.71	*	65.00				

*Required information not given.

C. F. Paine & Co., Athol
Special Mixed Lawn Seed

982

Ingredients:								
Kentucky Bluegrass	34.00	33.38	80.00					
Redtop, Fancy	35.31	—	90.00					
Chewings Fescue	4.90	0.86	85.00					
Astoria Bent	1.98	—	90.00					
Domestic Ryegrass	14.85	18.92	90.00					
Agrostis spp. (Redtop and Astoria Bent)	—	38.33	—					
			75.00					
			31.00					
			93.00					
			87.00					

Germination and percentage below that stated.

L —
F 95.73

83.00

0.22
0.30

4.01
3.97

—
—

3/1945
6/1945

L —
F 89.32

0.50
0.38

9.58
6.39

0.80
3.91

1/1945
6/1945

L —
F 97.12

0.33

2.50

0.05

*
/

7/1945

L —
F 91.49

0.31
0.54

8.65
7.76

0.21

2/1945
6/1945

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients		Germination		Pure Seed	Weed Seed	Inert Matter	Other Seed	Date of Test	Remarks
		Label	Found	Label	Found						
1042	Doughten Seed Co., Jersey City, N. J. The Garden Shop, Natick Freedom Lawn Seed Mixture, No. 221 x 5										
	Ingredients:										
	Kentucky Bluegrass	49.50	49.96	85.00	85.00		0.20	1.60	0.19	1	1945
	Redtop	27.93	—	90.00	—		0.36	1.31	0.08	7	1945
	Chewings Fescue	10.29	8.69	80.00	87.00						
	*Bent Grass	10.29	—	90.00	—						
	Agrostis spp.	—	39.60	—	84.00						
	(Redtop, Highland and Astoria Bents)										*"Bent grass" not sufficient; Highland and Astoria Bents found.
475	Leonard N. Jaques & Sons, Milford Faith Lawn Seed Mixture with Clover, No. L-254 X										
	Ingredients:										
	Kentucky Bluegrass	35.49	33.98	80.00	73.00						
	Redtop	27.60	—	90.00	—		0.35	8.52	0.29	1	1945
	White Clover	3.10	2.96	70.20	82.8		0.99	9.99	1.05	6	1945
	*Bent	4.85	—	85.00	—						
	Common Ryegrass	19.80	18.70	90.00	93.00						
	Agrostis spp.	—	32.33	—	85.00						
	(Redtop, Colonial and Highland Bents)										*"Bent" not sufficient; Colonial and Highland Bents found.
1058	John G. Seags & Sons, South Yarmouth Special Mixture, No. BT 7096										
	Ingredients:										
	Redtop	75.36	—	90.00	—		0.19	1.92	0.05	1	1945
	Kentucky Bluegrass	—	6.20	—	83.00		1.53	1.14	—	7	1945
	White Clover	7.39	6.17	90.00	95.1						Found but not declared.
	Chewings Fescue	7.54	6.43	80.00	89.00						
	*Bentgrass	7.55	—	90.00	—						
	Agrostis spp.	—	78.93	—	90.00						
	(Redtop, Highland and Astoria Bents)										*"Bentgrass" not sufficient; Highland and Astoria Bents found.

Garfield Williamson Co., Jersey City, N. J.
Hyde Park Supply Co., Hyde Park
Yankee Mixture, No. 18-5.....

357

Ingredients:

Kentucky Bluegrass.....	2.46	3.36	50.00	62.00				
Redtop.....	6.15	7.86	78.00	85.00				
Timothy.....	61.50	65.91	75.00	67.00				
Domestic Ryegrass.....	9.80	9.11	90.00	90.00				

L	86.24	1.50	17.09	1.50	2/1945
F		0.29	12.33	0.29	5/1945

Germination below that stated.

J. Oliver Johnson & Co., Chicago, Ill.

Clyde E. Ricek, Arlington
West Park Mixed Grass Seed.....

501

Ingredients:

Redtop, Fancy.....	13.50	12.92	90.00	86.00				
Timothy.....	49.50	47.25	80.00	58.00				
White Clover.....	0.50	0.71	75-15	27-69				
Domestic Ryegrass.....	21.78	20.15	90.00	92.00				

L	81.03	1.00	13.22	0.50	1/1945
F		0.26	15.69	3.02	6/1945

Germination below that stated.

D. Landreth Seed Co., Bristol, Pa.

Leavitt's Sport Shop, Haverhill
Shady Place Lawn Seed, No. 2-G-1.....

212

Ingredients:

Kentucky Bluegrass.....	11.27	6.43	80.00	74.00				
Redtop.....	30.09	35.10	87.00	81.00				
Chewings Fescue.....	22.54	27.54	89.00	91.00				
Perennial Ryegrass.....	6.98	5.20	95.00	90.00				
Domestic Ryegrass.....	14.88	8.35	95.00	90.00				

L	82.62	0.39	12.64	1.21	1/1945
F		0.44	14.85	2.09	4/1945

Percentage below that stated.

Determined by Fluorescence,
Determined by Fluorescence,
Percentage below that stated.

H. V. Lawrence, Falmouth, Mass.

Lawrence Cape Cod Lawn Mixture with Clover, No. W S 39.....

1062

Ingredients:

Kentucky Bluegrass.....	20.40	19.78	80.00	64.00				
Redtop.....	45.12	41.54	90.00	90.00				
White Clover.....	9.80	9.49	85.00	84-6				
Chewings Fescue.....	11.76	12.55	80.00	89.00				
Perennial Ryegrass.....	6.00	7.17	90.00	93.00				

L	90.53	0.60	6.32	—	2/1945
F		1.74	7.44	0.29	7/1945

Weed Seed Excessive.

Germination below that stated.

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture. Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients		Germination		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
1081	John D. Lyon, Inc., Belmont, Mass., F. Diehl & Son, Wellesley Special Mixture Grass Seed, No. 13623					L 97.88	0.25	1.56	0.31	1/1945	Inert Matter excessive. Germination below that stated. Germination below that stated.
						F 93.46	0.48	3.23	2.83	7/1945	
	Ingredients:										
	Kentucky Bluegrass...	19.70	20.14	98.00	85.00						
	Redtop, Fancy.....	62.72	—	94.00	—						
	White Clover.....	3.13	1.90	90.00	75-23						
	Chewings Fescue.....	7.43	6.33	90.00	85.00						
	Colonial Bent.....	4.90	—	89.00	—						
	Agrostis spp.....	—	65.09	—	95.00						
	(Redtop and Colonial Bent)										
1091	Middlesex County Farm Bureau Assoc., Waltham, Mass. Sunny Spot Lawn Seed Mixture.....					L 93.00	0.50	6.50	—	*/*	*/**Required but not stated.
						F 91.73	0.65	7.48	0.14	7/1945	
	Ingredients:										
	Kentucky Bluegrass...	30.00	24.66	85.00	78.00						
	Redtop, Fancy.....	25.00	—	90.00	—						
	Chewing Fescue.....	20.00	18.80	75.00	50.00						
	Colonial Bent.....	5.00	—	90.00	—						
	Domestic Ryegrass.....	20.00	19.79	90.00	92.00						
	Agrostis spp.....	—	28.48	—	91.00						
	(Redtop and Colonial Bent)										
808	Montgomery Ward Co., Chicago, Ill. Montgomery Ward Co., Greenfield Ward's Shady Lawn Mixture, AMS 1101, No. 25 J 116					L —	0.50	6.65	—	1/1945	Found but not declared.
						F 94.81	0.28	4.84	0.07	6/1945	
	Ingredients:										
	Kentucky Bluegrass...	21.75	20.73	75.00	73.00						
	Redtop.....	18.40	16.24	90.00	93.00						
	Chewings Fescue.....	38.00	40.22	65.00	67.00						
	Domestic Ryegrass.....	—	17.62	—	91.00						

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
1028	Wm. G. Scanell & Co., (Continued) Farmers' Cooperative Exchange, Framingham Greenway Lawn Seed Mixture No. 26825.....					L — F 88.84	0.50 0.58	9.75 10.42	0.10 0.16	2/1945 7/1945	
	Ingredients:										
	Kentucky Bluegrass.....	40.50	37.50	75.00	82.00						
	Redtop.....	28.00	—	90.00	—						
	White Clover.....	1.90	1.60	80.00	96-1						
	Chewings Fescue.....	4.85	4.83	80.00	51.00						
	*Bent Grass.....	4.60	—	85.00	—						
	*Ryegrass.....	9.80	—	90.00	—						
	Domestic Ryegrass.....	—	10.00	—	90.00						
	Aegrotis spp. (Redtop and Astoria Bent)	—	34.91	—	95.00						
966	The Stamford Seed Co., Buffalo, N. Y. H. Newell & Co., Shelburne Falls Reliable Lawn Seed, No. 5003 C					L — F 84.55	1.00 0.54	15.58 14.24	— 0.67	2/1945 6/1945	Germination below that stated. *Bent Grass" and "Ryegrass" not sufficient; Astoria Bent and Domestic Ryegrass found.
	Ingredients:										
	Kentucky Bluegrass.....	7.38	6.65	80.00	16.00						
	Redtop.....	15.42	14.17	85.00	70.00						
	Timothy.....	29.70	32.77	85.00	19.00						
	White Clover.....	3.00	2.48	80.00	75-21						
	Domestic Ryegrass.....	27.92	28.48	85.00	93.00						
967	H. Newell & Co., Shelburne Falls Liberty Lawn Seed, No. 5001					L — F 86.05	0.80 0.40	14.42 12.91	0.90 0.64	2/1945 6/1945	Germination below that stated.
	Ingredients:										
	Kentucky Bluegrass.....	17.22	16.37	80.00	40.00						
	Redtop.....	28.00	29.54	85.00	81.00						
	Timothy.....	15.68	18.42	85.00	85.00						
	White Clover.....	5.00	4.53	80.00	77-14						
	Domestic Ryegrass.....	17.98	17.19	85.00	91.00						

1077	<p>Sample Biddle Co., Philadelphia, Pa. Teaticket Hardware Co., Teaticket Biddle's Greengro Mixture 4 G I.....</p> <p>Ingredients: Kentucky Bluegrass..... Redtop..... Timothy..... White Clover..... Domestic Ryegrass.....</p>	<p>L — F 90.80</p> <p>7.33 14.37 49.80 0.25 20.79</p> <p>80.00 87.00 92.00 73-13 92.00</p>	<p>0.22 0.43</p> <p>7.37 8.62</p> <p>0.63 0.45</p> <p>4/1945 7/1945</p>	<p>Noxious weeds not declared but 15 English Plantain per oz. found.</p> <p>Germination below that stated.</p>
935	<p>Whitney Seed Co., Buffalo, N. Y. Burlingame & Duthy's Co., North Adams Burlingame & Duthy's Lawn Seed Mixture, No. WS 29.....</p> <p>Ingredients: Kentucky Bluegrass..... Redtop..... Timothy..... White Clover..... Domestic Ryegrass.....</p>	<p>L — F 89.33</p> <p>6.19 17.20 39.60 2.85 23.52</p> <p>75.00 85.00 90.00 82-16 90.00</p>	<p>1.00 0.19</p> <p>10.23 9.19</p> <p>1.29</p> <p>2/1945 6/1945</p>	<p>Germination below that stated.</p>
234	<p>Conlon & Donnelly Co., Attleboro Eureka Lawn Seed X 13</p> <p>Ingredients: Kentucky Bluegrass..... Redtop..... White Clover, Wild..... Clematis Fescue..... Creeping Bent..... Agrostis spp..... (Redtop and Colonial Bent)</p>	<p>L — F 96.45</p> <p>44.10 28.50 1.00 14.70 9.80 — 36.85</p> <p>85.00 92.00 77-19 91.00 90.00 — 92.00</p>	<p>0.15 0.84</p> <p>1.75 2.20</p> <p>0.51</p> <p>1/1945 5/1945</p>	<p>Weed Seed excessive.</p> <p>Germination below that stated. Creeping Bent labeled but Colo- nial Bent found.</p>
974	<p>S. D. Woodruff & Sons, Orange, Conn. Town Hardware Co., Orange Velvet Green Lawn Seed.....</p> <p>Ingredients: Kentucky Bluegrass..... Redtop..... Timothy..... White Clover..... Domestic Ryegrass.....</p>	<p>L — F 93.56</p> <p>17.00 27.63 24.90 0.99 23.94</p> <p>80.00 90.00 91.00 90.00 90.00</p>	<p>0.55 0.45</p> <p>4.98 5.93</p> <p>0.06</p> <p>1/1945 6/1945</p>	<p>Germination below that stated. Germination below that stated.</p>

Results of Inspection and Germination of Vegetable Seeds Section 261 D

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety; the percentage of germination, with the month and year tested, provided the germination is below the Massachusetts Standard; and the name and address of the vendor, packer, or processor.

Nine hundred and fifty three samples of vegetable seeds were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of the law. Twenty-four samples, not shown in the table, were found to be above standard and thus complied with the law, but were below the germination stated on the label. **All samples shown in the table were below standard in germination.**

The wholesaler's name is in boldface type. "Wholesaler Unknown" is applied to samples of seed which were purchased for a previous season's sale but were offered for sale during the current season without having been retested.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Associated Seed Growers, Inc., New Haven, Conn.							
		Checkerboard Feed Store, No. Adams					
937	Cauliflower	Early Snowball.....	77	3/1945	63	6/1945	75
938	Peas	Thomas Laxton.....		3/1945	67	6/1945	80
1204	Tomato	Dwarf Champion.....			59	7/1945	75
Martin W. Dugan Co., Newburyport							
1208	Lettuce	Prize Head Early.....			47	7/1945	80
W. Atlee Burpee Co., Philadelphia, Pa.							
Poole & Blodgett Co., Danvers							
1246	Beet	Detroit Dark Red.....	App. 87	11/1944	55	7/1945	65
Comstock, Ferre & Co., Wethersfield, Conn.							
Ricard Grain Co., New Bedford							
1181	Parsley	Curled or Double.....			50	7/1945	60
Essex Co. Cooperative Farming Assoc., Topsfield, Mass.							
1134	Celery	Golden Plume.....			28	7/1945	55
1135	Pumpkin	Conn. Field.....			42	7/1945	75
1136	Squash	Green Hubbard.....			62	7/1945	75
Thomas J. Grey Co., Boston, Mass.							
112F	Beans	Stringless Green Pod Giant.....			65	4/1945	80
Charles C. Hart Seed Co., Wethersfield, Conn.							
Centralville Hardware Co., Lowell							
1237	Lettuce	New York.....			24	7/1945	80
C. F. Paige & Co., Athol							
1093	Lettuce	May King.....			25	7/1945	80
Budd D. Hawkins, Reading, Vt.							
Northboro Hardware Co., Northboro							
139	Cabbage	Fine Early Winningstadt.....	App. 75	12/1944	65	4/1945	75
The Vermont Store, Amherst							
160	Lettuce	Extra Early Tennisball or Boston Market.....	App. 75	12/1944	49	4/1945	80
Michael Leonard Seed Co., Chicago, Ill.							
W. F. Aubuchon Co., Inc., Milford							
487	Lettuce	Big Boston.....			65	5/1945	80
F. W. Carson Co., Quincy							
1409	Celery	Golden Self Blanching.....			34	8/1945	55

Results of Inspection and Germination of Vegetable Seeds
Section 261D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
220	Broccoli	J. B. Rice, Jr., Inc., Shushan, N. Y. Fred F. Smith, Inc., Reading Calabrese.....	App. 80	11/1944	62	4/1945	75
472 F	Turnip	Ross Bros. Co., Worcester, Mass. L. N. Jaques & Sons, Milford Early Purple Top Flat.....	90	.....	52	5/1945	80
771	Cucumber	Rudy Patrick Seed Co., Kansas City, Mo. Western Auto Association Store, Palmer Long Green.....	.....	.....	57	6/1945	80
1049	Parsnip	Western Auto Association Store, Wareham Hollow Crown No. 2887.....	60	1/1945	40	7/1945	60
368	Cabbage	Joseph Sordillo & Sons, Boston, Mass. Tottler's Improved Brunswick.....	.....	.....	54	5/1945	75
1318	Onion	F. H. Woodruff & Sons, Milford, Conn. J. B. Sibley & Son, Ware Large Red Wethersfield.....	.....	.....	0	8/1945	70
1316	Pepper	Bull Nose or Large Bell.....	.....	.....	2	8/1945	55
1150	Kale	Spence Hardware & Supply Co., Methuen Dwarf Curled.....	.....	.....	2	7/1945	.....
S 37	Beans	S. D. Woodruff & Sons, Orange, Conn. Metropolitan State Hospital, Waltham Bountiful, No. 3052.....	App. 85	1/1945	66	4/1945	80
S 41	Broccoli	Calabrese, No. 2460.....	App. 85	12/1944	52	4/1945	75
376 F	Beans	**Wholesaler Unknown Allen Hardware Co., Needham Horticultural.....	.....	.....	71	5/1945	80
156 F	Beet	W. E. Aubuchon Co., Inc., Amherst Detroit Dark Red.....	.....	.....	54	4/1945	65
1233	Lettuce	Cover Grain & Feed Co., Lowell Black Seeded Simpson.....	.....	.....	49	7/1945	80
1373	Lettuce	Crolek Hardware Co., Ipswich Iceberg.....	.....	.....	35	8/1945	80
1245	Turnip	Danvers Hardware Co., Danvers Purple Top.....	37	.....	16	7/1945	80
1275	Pumpkin	Dresser-Hull Co., Lee Conn. Field.....	.....	.....	54	8/1945	75
1206	Celery	Martin W. Dugan Co., Newburyport Boston Market.....	.....	1944	0	7/1945	55
1188	Parsnip	G. M. Earl, Merrimac Hollow Crown.....	.....	.....	2	7/1945	60
1053	Squash	Hyannis Hardware Co., Hyannis Summer Crookneck.....	.....	.....	62	7/1945	75
1395	Lettuce	Lynn Bird & Seed Co., Lynn New York or Wonderful.....	.....	.....	30	8/1945	80
371 F	Beans	Needham Hardware Co., Needham Stringless Green Pod.....	.....	.....	70	5/1945	80
526 F	Rutabaga	J. O. Neil Supply Co., Fall River Macomber.....	.....	.....	47	6-/1945	75

**Wholesaler not named because retailer admits, or wholesaler claims, that the following lots of vegetable seeds were not purchased by the retailer during the current year.

Results of Inspection and Germination of Vegetable Seeds
Section 261D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Wholesaler Unknown, (Continued)							
1182	Swiss Chard	Ricard Grain Co., New Bedford Lucullus.....	63	1945	48	7/1945	65
1152	Dandelion	F. X. Robichaud, Methuen Improved Giant Thick Leaf.....			0	7/1945	45
839 F	Radish	Rocky's Hardware Co., Springfield Long Black.....			10	6/1945	75
836 F	Rutabaga	Bloodsdales.....			0	6/1945	75
1315	Lettuce	J. B. Sibley & Son, Ware New York No. 12.....			0	8/1945	80
1384	Lettuce	J. Raymond Smith, Gloucester Prizehead.....			0	8/1945	80
1304	Lettuce	The Snyder Store, Housatonic Improved, No. 44.....			5	7/1945	80
1148	Lettuce	Spence Hardware Co., Methuen Big Boston.....			68	7/1945	80
1076	Cabbage	Teaticket Hardware Co., Teaticket Stonemason.....			50	7/1945	75
1387	Cabbage	Tree-Land Inc., Cambridge All Seasons.....			9	8/1945	75
1388	Celery	Boston Market.....			3	8/1945	55
1390	Kale	Dwarf Green Curled.....			62	8/1945	75
1389	Lettuce	New York.....			8	8/1945	80
1391	Onion	Red Wethersfield.....			4	8/1945	70
1263	Onion	United Cooperative Farmers' Exchange Fitchburg Yellow Globe.....			25	7/1945	70
418	Broccoli	Walsh & Packard, Inc., Hingham Italian.....			46	5/1945	75

**Wholesaler not named because retailer admits, or wholesaler claims, that the following lots of vegetable seeds were not purchased by the retailer during the current year.

Summary of Inspection

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Apothecaries Hall Co., Waterbury, Conn.				4	2	2	1	1	0
Associated Seed Growers, Inc., New Haven, Conn.	39	35	4	1	1	0	1	0	1
Aubuchon, A. W., & Co., Fitchburg, Mass.	1	1	0						
Barber & Bennett, Inc., Albany, N. Y.				1	0	1			
Barrett, W. E. & Co., Providence, R. I.	6	6	0						
Belt Seed Co., The Baltimore, Md.				5	4	1			
Boston Market Gardener's Assoc., Waltham, Mass.	2	2	0						
Breck, Joseph, & Sons, Boston, Mass.	41	41	0	19	16	3	3	0	3
Burpee, W. Atlee, Co., Philadelphia, Pa.	18	17	1						
Comstock, Ferre & Co., Wethersfield, Conn.	78	77	1	3	3	0	2	1	1
Cone, Arthur R., Buffalo, N. Y.	20	20	0	49	30	19	4	1	3
Craver-Dickinson Co., Chicago, Ill.				5	5	0			
Crosman Seed Corp., East Rochester, N. Y.	12	12	0						
Danvers Hardware Co., Danvers, Mass.	1	1	0						
Dickinson, Albert, Co., Chicago, Ill.				3	3	0	1	1	0
Doughten Seed Co., Jersey City, N. J.				2	2	0	3	0	3
Duryea Seed Co., New York, N. Y.				3	1	2			
Eastern States Farmers' Exchange, Springfield, Mass.	22	22	0	18	15	3	2	2	0
Empire Seed Co., Fredonia, N. Y.,	11	11	0						
Engbretson Seed Co., Astoria, Oregon				1	0	1			
Essex County Cooperative Farming Assoc., Topsfield, Mass.	5	2	3						
Ferry-Morse Seed Co., Detroit, Mich.	19	19	0						
Fisi Sales Co., Boston, Mass.	4	4	0						
Fraser's, Wellesley, Mass.	7	7	0						
Fredonia Seed Co., Fredonia, N. Y.	14	14	0				1	1	0

Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Garfield Williamson Co..... Jersey City, N. J.							1	0	1
Genesee Valley Seed Co. Dalton, N. Y.	5	5	0						
Grey, Thomas J., Co..... Boston, Mass.	15	14	1	6	4	2	1	1	0
Harris, Joseph, & Co..... Rochester, N. Y.	12	12	0						
Hart, Charles C., Seed Co..... Wethersfield, Conn.	67	65	2	2	0	2	3	3	0
Hawkins, Budd D..... Reading, Vt.	35	33	2						
Johnson, J. Oliver, & Co..... Chicago, Ill.							1	0	1
Kresge S. S., & Co..... Detroit, Mich.							1	1	0
Landreth, D., Seed Co..... Bristol, Pa.	45	45	0	7	4	3	1	0	1
Lawrence, H. V..... Falmouth, Mass.	4	4	0				1	0	1
Lyon, John D., Inc..... Belmont, Mass.				3	3	0	1	0	1
Mandeville & King Co..... Rochester, N. Y.	7	7	0						
Michael-Leonard Seed Co..... Chicago, Ill.	38	36	2						
Middlesex County Farm Bureau Assoc.. Waltham, Mass.							1	0	1
Montgomery Ward Co..... Chicago, Ill.							1	0	1
(*New England Toro Co..... West Newton	3	3	0						
Northrup, King & Co..... Minneapolis, Minn.	12	12	0						
Ostberg Seed Co..... Chicago, Ill.							2	0	2
Page Seed Co..... Greene, N. Y.	39	39	0	11	9	2	1	0	1
Pedigreed Seed Co..... New York, N. Y.							1	0	1
Perry Seed Co..... Boston, Mass.	12	12	0						
Philadelphia Seed Co..... Philadelphia, Pa.							1	1	0
Ralston Purina Co..... St. Louis, Mo.	23	23	0	1	1	0			
Reist Seed Co..... Lancaster, Pa.				1	1	0			
Rice, J. B., Jr., Inc..... Shushan, N. Y.	12	11	1						
Rice, Jerome B., Seed Co..... Cambridge, N. Y.	11	11	0						
Ross Bros. Co..... Worcester, Mass.	21	20	1						

*Known as The Clapper Company.

Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Rudy Patrick Seed Co. Kansas City, Mo.	4	2	2				1	1	0
Scarlett, Wm. G., & Co. Baltimore, Md.				17	14	3	2	0	2
Scott, O. M., & Sons. Marysville, Ohio				1	1	0			
Sears, Roebuck & Co. Chicago, Ill.	15	15	0	2	1	1			
Sordillo, Joseph, & Sons. Boston, Mass.	10	9	1						
Stanford Seed Co. Buffalo, N. Y.				24	21	3	2	0	2
Sterling Seed Co. Minneapolis, Minn.	9	9	0						
Supple Biddle Co. Philadelphia, Pa.							1	0	1
Templin Bradley Co. Cleveland, Ohio	18	18	0						
Varick, John B., Co. Manchester, N. H.	5	5	0						
Vaughan's Seed Store. New York, N. Y.	6	6	0						
Western Auto Supply Co. Kansas City, Mo.	2	2	0						
Whitney Seed Co. Buffalo, N. Y.	4	4	0	39	29	10	3	1	2
Winers Hardware Store. Quincy, Mass.	5	5	0						
Woodruff, F. H., & Sons. Milford, Conn.	82	79	3	8	7	1			
Woodruff, S. D., & Sons. Orange, Conn.	92	90	2	12	7	5	1	0	1
Unknown	40	12	28						
TOTALS.	953	899	54	248	184	64	45	15	30

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted in Conjunction with the Department of Olericulture

Grant B. Snyder, Professor

Each year tests are conducted by the Experiment Station to check on the quality of vegetable seed that is distributed and sold in packets throughout the State. The tests help to inform the public of the merits of certain strains and varieties of seed and also serve as a check to detect mixtures and substitutions that occur accidentally or otherwise. The results reported here should be interpreted with certain reservations, however, because of the fact that all strains and varieties are not affected alike by various climatic and soil conditions.

The soil of the trial plot was a fine, sandy loam and is naturally fertile. A rye cover crop was plowed under, a liberal quantity of fertilizer was applied and the soil was thoroughly prepared prior to seedage. Growth and development was generally satisfactory in spite of the very wet growing season.

Yield records were not taken because of the necessity of using small plots and also because replication of the plantings was impossible with the large number of strains and varieties that were planted. Conformity to type has been the measure of general excellence in these tests. Individual plants have been called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety in question.

The comparative type and performance records reveal that all but a few of the stocks were true to name and most of them were highly productive. A few strains were either misnamed or misrepresented but this was the exception rather than the rule.

The source of the seed and the laboratory germination is given together with remarks on conformity to type, except that those lots of seed which were tested in the field and were found 100% true-to-type are not included in this table.

Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., New Haven, Conn.				
823 F	Radish	Anthony Cos., Chicopee Early Scarlet Globe.....	90	2% Deep Purple — 2% Cylindrical — 6% Top Shape
499 F	Beet	Lake Hardware Co., Arlington Crosby's Egyptian.....	92	4% Deep Globe Shape — 4% Cylindrical
517 F	Beet	W. J. Walker Co., Wakefield Detroit.....	96	4% Flattened
819 F	Turnip	Wells Hardware Co., Holyoke Yellow Swede.....	—	88% Rutabaga — 2% Purple Top Turnip
820 F	Turnip	Yellow Globe.....	98	2% Purple Top
Joseph Breck & Sons, Boston, Mass.				
126 F	Radish	Saxa.....	80	2% White Tip — 2% Oblong — 2% Long — 14% Spindle Shape
124 F	Turnip	Purple Top Strap Leaf.....	99	1% White
371 F	Beans	Needham Hardware Co., Needham Stringless Green Pod.....	99	1% Pole Beans
424 F	Beet	The Welch Co., Scituate Harbor Early Blood.....	98	2% Spindle

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type $\frac{\text{c}}{\text{c}}$	Remarks
W. Allee Burpee Co., Philadelphia, Pa.				
484 F	Rutabaga	William H. Casey Store, Milford American Purple Top Yellow.....	100%	Purple Top White Globe Turnip
51 F	Beet	Clinton Hardware & Auto Supply Co., Clinton Detroit Dark Red.....	92	2% Light Red — 6% Short Spindle
9 F	Carrot	Northboro Hardware Co., Northboro Danvers Half Long.....	88	6% Cylindrical — 6% Stump Rooted
196 F	Beet	The Service Co., Foxboro Crosby's Egyptian.....	98	2% Short Top Shape
Comstock, Ferre & Co., Wethersfield, Conn.				
411 F	Beet	A. J. Cataldo & Sons, Franklin Edmand's Early Turnip.....	92	6% Obovate — 2% Long Top
504 F	Beans	Center Hardware Co., Woburn Long Yellow Six Weeks.....	100%	Flat Green
531 F	Turnip	G. W. Gardiner & Sons, Fall River Early Snowball.....	88	12% Purple Top
25 F	Beans	Frank P. Mills, Campello Plentiful.....	99	1% Pencil Pod Wax
788 F	Rutabaga	Splann Estate, South Deerfield Improved Purple Top Yellow.....	98	2% Turnip
Crossman Seed Corp., East Rochester N. Y.				
193 F	Beans	Foxboro 5c-\$1 00 Store, Foxboro Stringless Green Pod.....	99	1% Flattened Pods
186 F	Beet	Detroit Dark Red.....	96	2% Flat—2% Long Top Shape
187 F	Carrot	Chautenay Half Long.....	94	6% Long Tapering
188 F	Radish	French Breakfast.....	84	4% Spindle — 6% Spherical 6% Long Top
807 F	Radish	Montgomery Ward Co., Greenfield Icele or Vienna.....	96	4% Red Shoulder
Eastern States Farmers' Exchange, Springfield, Mass.				
Eastern States Farmers' Exchange, Montello				
85 F	Beans	Stringless Green Pod.....	98	2% Flattened Pods
78 F	Beet	Crosby's Early Wonder.....	99	1% Short Top Shape
79 F	Beet	Detroit Dark Red.....	96	4% Long Top
82 F	Radish	Sparkler White Tip.....	90	6% Spindle Shape—4% Long
Empire Seed Co., Fredonia, N. Y.				
Woodlawn Supply Co., South Hadley				
560 F	Beet	Early Blood Turnip.....	88	12% Short Top Shape
562 F	Radish	Early Crimson Giant Globe.....	94	2% Spindle — 4% Long Top
564 F	Turnip	Purple Top Strap Leaved.....	99	1% White
Ferry-Morse Seed Co., Detroit, Mich.				
Jordan Marsh Co., Boston				
251 F	Beet	Early Blood Turnip.....	98	2% Short Spindle
252 F	Carrot	Chautenay, Red Cored.....	98	2% Long Tapering
256 F	Radish	Crimson Giant.....	82	18% Long Top
Stoneham Paint & Hardware Supply, Stoneham				
511 F	Beet	Detroit Dark Red, Ferry's Strain.....	98	1% Obovate—1% Spindle Shape
Fraser's, Wellesley, Mass.				
384 F	Beet	Crosby's Egyptian.....	98	2% Short Top
402 F	Carrot	Red Cored Chautenay.....	86	14% Cylindrical
386 F	Rutabaga	Long Island Improved.....	98	2% Purple Top Turnip
388 F	Turnip	Purple Top White Globe.....	99	1% White
Fredonia Seed Co., Fredonia, N. Y.				
Bellingham Hardware Co., Weymouth				
684 F	Turnip	White Egg.....	98	2% Purple Top

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Fredonia Seed Co. (Continued)				
333 F	Beet	Thomas L. McGrath, Whitman Early Blood Turnip	80	20% Top Shape
334 F	Carrot	Chantenay	98	2% Long Tapering
335 F	Radish	Early Scarlet Globe	84	8% Long Top—8% Spindle Shape
336 F	Turnip	Purple Top Flat Strap Leaf	99	1% White
Thomas J. Grev Co., Boston				
112 F	Beans	Stringless Green Pod	99	1% Flattened Pods
106 F	Beet	Crosby's Egyptian Selected	98	2% Very Light Red
107 F	Carrot	Streamliner	88	12% Cylindrical
109 F	Radish	Early Scarlet Globe	92	8% Top Shape
Joseph Harris & Co., East Rochester N. Y.				
94 F	Beet	Joseph Harris & Co., Cambridge Crosby's Egyptian	99	1% Short Spindle
93 F	Carrot	Hutchinson	98	2% Cylindrical
98 F	Radish	Cavalier No. 821	92	2% Obovate—6% Spindle Shape
Charles C. Hart Seed Co., Wethersfield, Conn.				
831 F	Beet	Carlisle Hardware Co., Springfield Detroit Dark Red	98	2% Very Light Red
832 F	Turnip	Purple Top White Globe	94	6% White
R. E. Cobb, Inc., Weymouth				
695 F	Radish	Early Scarlet Globe	88	4% Spindle Shape—8% Long Top
Downey & Howland, Fall River				
537 F	Beet	Edmand's Blood Turnip	98	2% Top Shape
Jeffway-Hatch Co., Easthampton				
848 F	Radish	White Icicle	98	2% Red
Mason's Farm Market, Springfield				
571 F	Radish	White Icicle	98	2% Pink
Rocky s Hardware Co., Springfield				
837 F	Radish	Early Scarlet Globe	88	12% Long Top
836 F	Rutabaga	Bloomsdale .....	..	No Germination
Sears Plumbing & Heating Co., So. Deerfield				
793 F	Beet	Detroit Dark Red	92	4% Very Light Red—2% Long Top Shape — 2% Long Stump Rooted
Waite Hardware Co., Worcester				
624 F	Beet	Detroit Dark Red	96	2% Top Shape — 2% Light Red
Budd D. Hawkins, Reading, Vermont				
Elwood Adams Co., Worcester				
142 F	Beet	New Eclipse, Ea. Blood Turnip	98	2% Short Spindle
143 F	Beet	Detroit Dark Red	92	8% Flattened
144 F	Carrot	Danvers Half Long, Orange	94	6% Stump rooted
I. B. Barrows & Co., Worcester				
175 F	Corn	Golden Cross Hybrid .....	..	Mixture of Golden Cross Types, Both Red and Green Tassel, Mostly Red.
168 F	Radish	Early Scarlet Turnip	80	2% Spindle Shape—18% Long
Franklin Hardware Corp., Springfield				
581 F	Radish	New French Breakfast	96	2% Spherical—2% Long Top
582 F	Radish	Ea. Scarlet Turnip-White Tip	96	4% Spindle Shape
D. Landreth Seed Co., Bristol, Pa.				
Elwood Adams Co., Worcester.				
48 F	Beet	Eclipse Extra Ea.	76	2% Oblong, 2% Long Top Shape — 16% Top Shape—4% Long Ovate
49 F	Beet	Early Blood Red	94	4% Deep Globe—2% Short Top
Belmont Hardware Co., Springfield				
842 F	Rutabaga	Purple Top	98	2% Turnips
841 F	Turnip	Yellow Globe	99	1% Purple Top

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
D Landreth Seed Co., (Continued)				
183 F	Beet	Foxboro 5c—\$1.00 Store, Foxboro Extra Early Egyptian.....	94	6% Globe Shape
289 F	Carrot	Sunshine Feed Store, Bridgewater Orange Danvers.....	96	4% Cylindrical
46 F	Beet	Worcester Grain & Coal Co., Worcester Detroit Dark Red.....	95	1% Oblong, -2% Obovate 2% Scarlet
240 F	Radish	Yankee Maid Products, Inc., Boston Scarlet Turnip, White Tip....	94	2% Egg Shape—4% Spindle Shape
242 F	Rutabaga	Macomber.....	98	2% Purple Top Turnips
Mandeville & King Co., Rochester, N. Y.				
342 F	Radish	Rockland Hardware & Paint Co., Rockland Scarlet Turnip, White Tip.....	88	10% Long Top—2% Spindle
Michael-Leonard Seed Co., Chicago, Ill.				
299 F	Beans	W. E. Aubuchon Co., Ayer Golden Wax.....	99	1% Green Pod
50 F	Beet	W. E. Aubuchon Co., Clinton Detroit Dark Red.....	90	8% Long Top Shape—2% Light Red
490 F	Carrot	W. E. Aubuchon Co., Milford Danvers Half Long.....	90	10% Cylindrical
488 F	Radish	Scarlet Turnip, White Tip....	92	8% Scarlet Tip
554 F	Radish	W. E. Aubuchon Co., Spencer Scarlet Turnip, White Tip....	86	8% Scarlet Tip — 4% Top Shape — 2% Spindle
870 F	Turnip	Hamilton-Atwater Co., Westfield Yellow Globe.....	98	2% Purple Top
851 F	Radish	Jeffway-Hatch Co., Easthampton White Icicle.....	98	2% Red
New England Toro Co., West Newton, Mass.				
758 F	Radish	Scarlet Globe.....	84	2% Oblong — 14% Long Top Shape
Northrup, King & Co., Minneapolis, Minn.				
161 F	Beet	F. W. Woolworth Co., Ware Extra Early Flat Egyptian.....	98	2% Globe Shape
162 F	Carrot	Chantenay Red Cored.....	96	4% Long Tapering
166 F	Turnip	Purple Top Strap Leaf.....	99	1% White
The Page Seed Co., Greene, N. Y.				
1 F	Beans	Community Grain Store, Worcester Pencil Pod Black Wax.....	99	1% Flattened Pod
3 F	Beet	Detroit Dark Red.....	96	4% Long Top
5 F	Carrot	Danvers Half Long.....	98	2% Cylindrical
J. H. Fairbanks Co., Bridgewater				
437 F	Rutabaga	American Purple Top.....	90	10% Turnips
438 F	Rutabaga	Macomber.....	98	2% Purple Top Turnips
R. J. Lafleur, Chicopee				
828 F	Carrot	Danvers.....	86	14% Cylindrical
827 F	Radish	Crimson Giant.....	88	12% Top Shape
Harry Seder, Webster				
893 F	Corn	Golden Bantam.....	..	Most Likely Marcross
Perry Seed Co., Boston, Mass.				
261 F	Beet	Early Wonder.....	99	1% Short Top shape
269 F	Corn	Lincoln.....	90	10% Green Tassel — Off- Type Plants
264 F	Radish	Perry's Scarlet Globe.....	86	14% Top Shape
Ralston Purina Co., St. Louis, Mo.				
407 F	Corn	Checkerboard Feed Store, Franklin Golden Cross Bantam.....	96	4% Green Tassel, Mixed Red and Green Tassel

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type	Remarks
Ralston Purina Co., (Continued)				
549 F	Beet	Checkerboard Feed Store, Spencer Detroit Dark Red.....	96	4% Flattened
53 F	Beet	Checkerboard Feed Store Taunton Early Blood Turnip.....	94	6% Long Top Shape
54 F	Beet	Crosby's Early Egyptian.....	92	6% Short Top Shape—2% Short Spindle
56 F	Carrot	Danvers Half Long.....	92	8% Cylindrical
58 F	Radish	Early Scarlet, White Tip.....	98	2% Top Shape
60 F	Turnip	Purple Top White Globe.....	99	1% White
J. B. Rice, Jr., Inc., Shushan, N. Y.				
Fred W. Smith, Inc., Reading				
213 F	Beet	Detroit Dark Red.....	96	4% Long Top Shape
214 F	Carrot	Danvers Half Long.....	90	10% Stump Rooted
216 F	Radish	Scarlet Turnip.....	90	8% Long Top—2% Long Spindle
Jerome B. Rice Seed Co., Cambridge, N. Y.				
Western Auto Stores, Quincy				
306 F	Beet	Crosby's Egyptian.....	98	2% Verv Light Red
Ross Bros. Co., Worcester, Mass.				
P. A. Richard Hardware Co., Spencer				
541 F	Beet	Detroit Dark Red.....	98	2% Short Spindle
543 F	Radish	French Breakfast.....	82	2% Spherical — 8% Spindle —8% Long Top
Rudy Patrick Seed Co., Kansas City, Mo.				
Western Auto Store, Palmer				
768 F	Beet	Early Blood Turnip.....	96	4% Top Shape
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Norwood				
202 F	Beans	Stringless Green Pod Black Valentine	99	1% Flattened
198 F	Beet	Detroit Dark Red.....	96	4% Obovate—Flattened Strain
199 F	Radish	Scarlet Turnip, White Tip.....	92	6% Spindle—2% Cylindrical —100% White Tip
200 F	Turnip	Purple Top White Globe.....	99	1% White
Sterling Seed Co., Minneapolis, Minn.				
J. J. Newberry & Co., Whitman				
317 F	Beet	Early Wonder or Crosby's Egyptian..	92	2% Light Red—2% Long Top Shape — 4% flat
318 F	Carrot	Imperator.....	90	10% Cylindrical
The Templin Bradley Co., Cleveland, Ohio				
(The Children's Flower Mission)				
Washington School, Taunton				
445 F	Carrot	Chanteny or Model.....	96	4% Long Tapering
446 F	Carrot	Danvers Half Long.....	96	4% Cylindrical
Vaughan's Seed Store, New York, N. Y.				
The Garden Shop, Wellesley				
379 F	Radish	Scarlet Turnip, White Tip.....	98	2% Spindle Shape
Winers Hardware Store, Quincy, Mass.				
Winers Hardware Store, Whitman				
330 F	Beet	Crosby's Egyptian.....	96	2% Obovate—1% Long Top Shape—1% Short Top Shape
F. H. Woodruff & Sons, Milford, Conn.				
Middlesex County Farm Bureau, Waltham				
16 F	Beet	Detroit Dark Red.....	96	4% Obovate
17 F	Beet	Woodruff's Early Wonder.....	97	1% Long Top—2% Short Top
701 F	Beet	Woodruff's Early Wonder.....	94	6% Short Top Shape
19 F	Carrot	Danvers Half Long.....	94	6% Stump Rooted
15 F	Spinach	Va. Blight Resistant 9-6222.....	99	1% Bloomsdale Type
Milford Hardware Co., Milford				
491 F	Radish	Scarlet Globe.....	94	2% Dark Purple—4% Long Top
J. O. Neill Supply Co., Fall River				
524 F	Turnip	White Egg.....	98	2% Purple Top
Waldron Hardware Co., Taunton				
467 F	Turnip	Purple Top White Globe.....	98	2% White

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
		F. H. Woodruff & Sons, (Continued)		
708 F	Radish	Winer's Hardware Co., Braintree Scarlet Globe.....	86	12% Top Shape—2% Spindle Shape
		S. D. Woodruff & Sons, Orange, Conn.		
379 F	Beet	Allen Hardware Co., Needham Detroit Dark Red.....	98	2% Long Top Shape
685 F	Radish	Bellingham Hardware Co., Weymouth Early Scarlet Globe.....	90	4% Obovate—6% Long Top
63 F	Peas	Copeland Hardware Co., Taunton Sure Crop Wax.....	99	1% Pencil Pod
600 F	Radish	H. J. Croceau & Co., Northampton Early Scarlet Turnip.....	..	4% Flattened—2% Spindle Shape—100% White Tip
442 F	Beans	J. H. Fairbanks & Co., Bridgewater Golden Wax.....	99	1% Green Pole
		Unknown		
156 F	Beet	W. E. Aubuchon Co., Amherst Detroit Dark Red.....	98	2% Short Spindle
895 F	Corn	Harry Seder, Webster Whipple's Yellow.....	..	Absolutely not Whipple's Yellow—Mixed Red and Green Tassel—looks like Golden Giant.

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor

and

E. B. Risley, Student Assistant

For the tenth season the Department of Floriculture has cooperated with the Seed Laboratory in conducting trials to determine the quality of flower seeds offered for sale in retail seed stores, hardware stores, chain stores, schools, and other retail outlets. The seeds, collected by the State Seed Inspector, were tested for germination and performance under field conditions.

All seeds were sown on July 6 and 7, which is late for many kinds of annuals, in particular those species which give best germination with cool soil temperatures. However, because of the abundance of rain in June, it was impossible to do the sowing at an earlier date. Rainfall for the four months is shown in the following table:*

	1945	Normal
June.....	7.67 inches	3.75 inches
July.....	7.36 "	4.10 "
August.....	2.79 "	4.08 "
September.....	3.57 "	4.24 "
Total.....	21.39 inches	16.17 inches

*Data on rainfall are taken from the Meteorological Observations of the Massachusetts Agricultural Experiment Station.

Because of the unfavorable conditions, duplicate sowings were made, if seed was available, for those varieties which gave unsatisfactory results in the first sowing. The results of such duplicate tests are indicated by the letter "D" in the table.

Seeds of 260 lots, representing 59 genera, packeted by 29 concerns, and obtained from 49 retailers, were distributed as follows:

Ageratum	6	Dianthus	7	Mirabilis	7
Alyssum	9	Didiscus	2	Nemesia	1
Anagallis	1	Dimorphotheca	1	Nemophila	2
Antirrhinum	6	Eschscholtzia	4	Nicotiana	2
Arctotis	1	Gaillardia	2	Nierembergia	1
Brachycome	2	Gilia	1	Nigella	2
Calendula	9	Godetia	2	Papaver	6
Callistephus	15	Gypsophila	7	Petunia	9
Celosia	6	Helichrysum	4	Portulaca	4
Centaurea	10	Hunnemannia	1	Reseda	3
Cheiranthus	3	Iberis	7	Salpiglossis	2
Chrysanthemum	6	Impatiens	1	Sanvitalia	1
Clarkia	3	Ipomoea	4	Scabiosa	7
Convolvulus	1	Kochia	3	Schizanthus	1
Coreopsis	3	Linaria	3	Tagetes	14
Cosmidium	1	Linum	1	Thunbergia	1
Cosmos	9	Lobelia	1	Tropaeolum	9
Cynoglossum	2	Lupinus	2	Verbena	5
Dahlia	3	Malcomia	1	Zinnia	20
Delphinium	5	Mathiola	8		
				Total	260

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, with only one-third or less of the plants not true to form or color; "fair", between one-third and two-thirds not true; and "not satisfactory" if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. However, since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

Results of the test on germination are summarized as follows. Four lots are omitted which were washed out by rain.

	NUMBER OF LOTS	PERCENT OF TOTAL
Good	108	42.19
Fair	69	26.95
Poor	79	30.86
None	0	0
	—	—
Total	256	100.00

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Bodger Seeds, Ltd., El Monte, Cal.				
238F	Calendula	Morroe's Seed Market, Attleboro		
237F	Gypsophila	Double Florist Special Mixture,	Fair	Satisfactory; 9 colors
		Elegans grandiflora Covent Garden Improved,	Good	Satisfactory
236F	Ipomoea	Morning Glory Heavenly Blue,	Good	Satisfactory
239F	Zinnia	Elegans Mixed, Pumila,	Good	Satisfactory; 14 colors
Joseph Breck & Sons, Boston, Mass.				
671F	Alyssum	Violet Queen,	Good	Satisfactory
(D)662F	Antirrhinum	Super Majestic Intermediate Rose Sensation,	Fair	Incomplete; only 2 plants in bloom Sept. 29
665F	Calendula	Orange King,	Good	Satisfactory
663F	Callistephus	Aster, Early Giant Light Blue,	Poor	Not satisfactory
664F	Callistephus	Aster, Princess Maisha,	Poor	Not satisfactory
666F	Chrysanthemum	Single, Choice Mixed,	Poor	Not satisfactory
667F	Convolvulus	Minor, Dwarf Morning Glory,	Good	Satisfactory
668F	Dianthus	Geisha Girl,	Good	Satisfactory; 6 colors
672F	Mathiola	Stock, Perfection Mixed,	Poor	Not satisfactory
(D)673F	Petunia	Dwarf Bedding, Cheerful,	Good	Incomplete; had not flowered Sept. 29
669F	Tagetes	Flaming Fire, Single French,	Good	Satisfactory
670F	Tagetes	Gigantea, Sunset Giants,	Good	Satisfactory
674F	Zinnia	Dwarf Defiance Golden Orange,	Good	Satisfactory
L. E. Corkum Hardw. Co., Newtonville				
752F	Lupinus	Lupine, Hartwegi Mixed,	Good	Satisfactory; 2 colors
751F	Tropaeolum	Dwarf Rainbow Mixed,	Good	Satisfactory; 4 colors
W. Atlee Burpee Co., Philadelphia, Pa.				
William H. Casey Store, Millford				
480F	Chrysanthemum	Fleuret Single Mixed,	Poor	Not satisfactory
479F	Clarkia	Finest Double Mixed,	Poor	Not satisfactory
478F	Didiscus	Blue Lace Flower,	Poor	Not satisfactory
481F	Eschscholtzia	California Sunset Mixture,	Good	Satisfactory; 5 colors
482F	Scabiosa	Large Flowered Tall Double Mixed,	Poor	Not satisfactory
Firestone Hardware & Auto Supply Co., Northampton				
601F	Alyssum	Sweet,	Poor	Not satisfactory
602F	Coreopsis	Calliopsis Tall Mixed,	Poor	Not satisfactory
603F	Mirabilis	Four O'Clock Tall Mixed,	Good	Satisfactory; 4 colors
605F	Petunia	Flaming Velvet,	Good	Satisfactory
604F	Tagetes	Burpee Gold Odorless Foliage,	Good	Incomplete; had not flowered Sept. 29
W. T. Grant Co., Boston				
661F	Alyssum	Sweet,	Good	Satisfactory
659F	Verbena	Giant Mixed,	Fair	Satisfactory; 4 colors
660F-A	Zinnia	Giant Dahlia-flowered Lavender,	Good	Satisfactory
660F-B	Zinnia	Giant Dahlia-flowered Scarlet,	Good	Satisfactory
660F-C	Zinnia	Giant Dahlia-flowered Yellow,	Fair	Satisfactory
660F-D	Zinnia	Giant Dahlia-flowered Rose,	Good	Satisfactory
Comstock, Ferre & Co., Wethersfield, Conn.				
La Palm Hardware Co., Webster				
901F	Tropaeolum	Tall Named Varieties Mixed,	Fair	Satisfactory; 5 colors
902F	Tropaeolum	Dwarf Named Varieties Mixed,	Fair	Satisfactory; 6 colors
Crosman Seed Corp., East Rochester, N.Y.				
S. S. Kresge Co., Boston				
734F	Ageratum	New Midget Blue,	Poor	Not satisfactory
732F	Callistephus	Aster, Giant Crego White,	Good	Incomplete; had not flowered Sept. 29
727F	Chrysanthemum	Annual Mixed Colors,	Fair	Incomplete; had not flowered Sept. 29
726F	Cosmos	Orange Flare Early Flowering,	Good	Satisfactory
733F	Dahlia	Double Hybrids Mixed Colors,	Poor	Not satisfactory
730F	Kochia	Mexican Fire Bush,	Good	Satisfactory
731F	Mathiola	Stock German Dwarf 10 weeks,	Fair	Incomplete; had not flowered Sept. 29
728F	Scabiosa	Tall Double Mixed,	Poor	Not satisfactory
725F	Tagetes	Royal Scot All Double,	Fair	Satisfactory
729F	Tagetes	Signata Pumila Border of Gold,	Fair	Satisfactory
735F	Zinnia	New Linearis,	Poor	Not satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Crosman Seed Corp., (Cont.)				
		S. S. Kresge Co., Quincy		
314F	Arctotis	Grandis, Blue-eyed Daisy.....	Poor	Not satisfactory
313F	Centaurea	Double Pink Cornflower.....	Good	Satisfactory
312F	Reseda	Mignonette Large Flowering Sweet..	Poor	Not satisfactory
Montgomery Ward Co., Greenfield				
803F	Antirrhinum	Giant Mixed, University of Cal. Strain	Poor	Not satisfactory
802F	Centaurea	Sweet Sultan Mixed.....	Good	Incomplete; had not flowered Sept. 29
798F	Cosmos	Single, Early Flowering Mixed.....	Good	Satisfactory; 4 colors
799F	Dahlia	Unwin's Dwarf Hybrids, Mixture of Colors.....	Good	Satisfactory; 3 colors
804F	Gaillardia	Double Mixed Colors.....	Poor	Not satisfactory
805F	Lupinus	Annual Sorts Mixed.....	Poor	Not satisfactory
800F	Tropaeolum	Dwarf Nasturtium Mixed Colors.....	Fair	Satisfactory
Empire Seed Co., Fredonia, N. Y.				
		Woodlawn Supply Co., South Hadley		
567F	Antirrhinum	Snapdragon Five Mixed Colors.....	Fair	Incomplete; 3 plants in bloom Sept. 29
565W	Cheiranthus	Wallflower, Finest Mixed.....	Good	Satisfactory
(1)568F	Dianthus	Mixed Colors.....	Good	Satisfactory; 3 colors
566F	Helichysum	Everlasting finest mixed colors.....	Poor	Not satisfactory
569F	Mirabilis	Four O'clock, Tall, Mixed Colors.....	Fair	Satisfactory; 6 colors
Ferry-Morse Seed Co., Detroit, Mich.				
		Carlisle Hardware Co., Springfield		
830F	Tagetes	Burpee Gold.....	Fair	Incomplete; had not flowered Sept. 29
W. T. Grant Co., Boston				
655F	Centaurea	Cyanus Double Mixed.....	Good	Satisfactory; 4 colors
656F	Clarkia	Double Mixed.....	Poor	Not satisfactory
657F	Gypsophila	Covent Garden Market.....	Good	Satisfactory
658F	Papaver	Iceland Sunbeam Mixed.....	Poor	Not satisfactory
Jordan Marsh Co., Boston				
257F	Callistephus	Aster Giant Crego Crimson.....	Poor	Not satisfactory
260F	Celosia	Childs, Woolflower, Crimson.....	Good	Satisfactory
259F	Dianthus	Double China Mixed.....	Poor	Not satisfactory
258F	Papaver	Double Shirley Sweet Briar.....	Poor	Not satisfactory
Frasier's, Wellesley, Mass.				
390F	Ageratum	Blue Perfection.....	Poor	Not satisfactory
391F	Chrysanthemum	Single, Choice Colors.....	Poor	Not satisfactory
703F	Didiscus	Blue Lace Flower.....	Fair	Incomplete; had not flowered Sept. 29
393F	Godetia	Double Mixed Colors.....	Poor	Not satisfactory
711F	Gypsophila	Baby's Breath Annual.....	Good	Satisfactory
704F	Nemesia	Strumosa.....	Poor	Not satisfactory
702F	Nicotiana	Tuberose-flowered Tobacco, White..	Good	Satisfactory
392F	Scabiosa	Blue Cockade.....	Fair	Incomplete; had not flowered Sept. 29
705F	Scabiosa	Mourning Bride, Mixed Colors.....	Poor	Not satisfactory
706F	Zinnia	Dahlia-flowered Rose.....	Good	Satisfactory
Cohasset Hardware Co., Cohasset				
423F	Lobelia	Crystal Palace.....	Good	Incomplete; had not flowered Sept. 29
Fredonia Seed Co., Fredonia, N. Y.				
		Bellingham Hardware Co., Weymouth		
677F	Chrysanthemum	Coronarium Double Hybrids Finest Mixed.....	Fair	Incomplete; had not flowered Sept. 29
681F	Coreopsis	Calliopsis Finest Mixed.....	Fair	Satisfactory; 4 colors
678F	Gypsophila	Baby's Breath, Large Flowers.....	Good	Satisfactory
680F	Iberis	Empress White.....	Poor	Not satisfactory
675F	Impatiens	Balsam Finest Mixed.....	Good	Satisfactory; 5 colors
679F	Mathiola	Stock Finest Mixed Double.....	Poor	Not satisfactory
682F	Tagetes	Guinea Gold.....	Fair	Incomplete; had not flowered Sept. 29
683F	Zinnia	Dahlia-flowered Orange.....	Fair	Satisfactory
Genesee Valley Seed Co., Dalton, N. Y.				
		S. S. Kresge Co., Boston		
736F	Dianthus	Laciniatus.....	Poor	Not satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Thomas J. Grey Co., Boston, Mass.				
(D)637F	Ageratum	Dwarf Blue Bedder.....	Good	Incomplete; had not flowered Sept. 29
639F	Alyssum	Minimum White Snow Cloth.....	Good	Satisfactory
640F	Calendula	Orange Fantasy Crested.....	Good	Satisfactory
638F	Callistephus	Aster Crested Princess Ann.....	Poor	Not satisfactory
648F	Callistephus	Aster Giant Crego Improved Azure Blue.....	Poor	Not satisfactory
642F	Centaurea	Imperialis Lavender Beauty.....	Poor	Not satisfactory
643F	Cosmos	Mammoth Extra Early Single Pink.....	Good	Satisfactory
644F	Delphinium	Larkspur Giant Imperial Los Angeles.....	Poor	Not satisfactory
645F	Helichrysum	Everlasting, Golden Ball.....	Fair	Incomplete; had not flowered Sept. 29
641F	Iberis	Candytuft, Crimson.....	Fair	Incomplete; one plant in flower Sept. 29
647F	Petunia	Hybrida Pendula Balcony White.....	Poor	Not satisfactory
646F	Tagetes	Chrysanthemum-flowered Mission Giants Mixed.....	Fair	Incomplete; had not flowered Sept. 29
Joseph Harris & Co., Rochester, N. Y.				
104F	Centaurea	Joseph Harris Co., Inc., Cambridge Cyanus Tall Double Blue.....	Fair	Incomplete; one plant in flower Sept. 29
105F	Mathiola	Stock Sure to Bloom Variety Mixture	Poor	Not satisfactory
Charles C. Hart Seed Co., Wethersfield, Conn.				
380F	Kochia	Allen Hardware Co., Needham Mexican Fire Bush.....	Good	Satisfactory
863F	Mathiola	Bryan Hardware Co., Westfield Stock Finest Mixed Dwarf 10 weeks.	Poor	Not satisfactory
R. E. Cobb Co., Weymouth				
688F	Gypsophila	Baby's Breath White.....	Fair	Satisfactory
690F	Helichrysum	Strawflower Mixed.....	Poor	Not satisfactory
(D)689F	Iberis	Candytuft Dwarf Hybrid.....	Good	Incomplete; had not flowered Sept. 29
691F	Papaver	Shirley Mixed.....	Poor	Not satisfactory
692F	Scabiosa	Mourning Bride Mixed.....	Poor	Not satisfactory
693F	Verbena	Hybrida Best Mixture.....	Good	Satisfactory; 6 colors
Jeffway-Hatch Co., Easthampton				
845F	Tropaeolum	Nasturtium Golden Gleam.....	Fair	Satisfactory
The Welch Co., Scituate				
429F	Celosia	Cristata Tall Mixed.....	Fair	Satisfactory; 4 colors
Budd D. Hawkins, Reading, Vt.				
180F	Brachycome	I. B. Barrows Co., Worcester Swan River Daisy.....	Good	Incomplete; had not flowered Sept. 29
176F	Callistephus	Aster, Scarlet.....	Poor	Not satisfactory
179F	Clarkia	Mixed Double.....	Poor	Not satisfactory
177F	Iberis	Candytuft Fine Mixed.....	Poor	Not satisfactory
178F	Salpiglossis	New Emperor.....	Fair	Satisfactory; 3 colors
D. Landreth Seed Co., Bristol, Pa.				
George E. Warren Hardware Co., Braintree				
739F	Alyssum	Benthami Procumbens.....	Fair	Satisfactory
738F	Callistephus	Aster Crego Giant Comet Mixed.....	Poor	Not satisfactory
740F	Celosia	Plumosa Plumed Mixed.....	Good	Satisfactory; 3 colors
737F	Coreopsis	Calliopsis Tall Mixed.....	Fair	Satisfactory; 7 colors
Yankee Maid Products, Inc., Boston				
250F	Calendula	Lemon Queen (Yellow Colossal).....	Good	Satisfactory
249F	Gypsophila	Baby's Breath Annual.....	Fair	Satisfactory
246F	Mathiola	Stock Mixed.....	Poor	Not satisfactory
247F	Mirabilis	Jalapa, Four O'Clocks Mixed.....	Good	Satisfactory; 5 colors
248F	Nicotiana	Affinis Hybrids Mixed.....	Good	Satisfactory; 3 colors
Mandeville & King Co., Rochester, N. Y.				
Bryan Hardware Co., Westfield				
(D)862F	Sanvitalia	Creeping Zinnia.....	Poor	Not satisfactory
861F	Zinnia	Lilliput Rosebud.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Mandeville & King Co., (Cont.)				
(D)835F	Antirrhinum	Carlisle Hardware Co., Springfield Large-flowered Giant Buttercup.....	Good	Incomplete; had not flowered Sept. 29
834F	Zinnia	Navajo, all colors.....	Fair	Satisfactory; 6 colors
422F	Papaver	Cohasset Hardware Co., Cohasset Flanders Field.....	Fair	Satisfactory
(D)374F	Verbena	Scarlet Defiance.....	Fair	Satisfactory
857F	Linum	Depping & Moore, Inc., Westfield Flax Scarlet.....	Good	Incomplete; had not flowered Sept. 29
858F	Thunbergia	Black-eyed Susan Vine. All Shades ..	Fair	Satisfactory; 2 colors
873F	Nierembergia	Hamilton & Atwater, Inc., Westfield Purple Robe.....	Poor	Not satisfactory
874F	Scabiosa	Mourning Bride Rosette.....	Poor	Not satisfactory
(D)846F	Iberis	Jeffway-Hatch Co., Easthampton Giant Hyacinth-flowered. White ..	Good	Incomplete; one plant in flower Sept. 29
854F	Cosmos	Manchester Forbes Co., Easthampton Yellow Flare (Klondyke).....	Poor	Not satisfactory
865F	Papaver	Flanders Field.....	Fair	Satisfactory
750F	Cheiranthus	Moore & Moore, Newton Corner Siberian Wallflower.....	Good	Satisfactory
749F	Gaillardia	Indian Chief, Single.....	Poor	Not satisfactory
375F	Dianthus	Needham Hardware Co., Needham Sweet Wivelsfield.....	Poor	Not satisfactory
(D)882F	Brachycome	Waite Hardware Co., Southbridge Swan River Daisy.....	Good	Incomplete; had not flowered Sept. 29
748F	Anagallis	George E. Warren Hardware Co. Braintree Pimpernel.....	Poor	Not satisfactory
747F	Linaria	Fairy Bouquet.....	Poor	Not satisfactory
746F	Schizanthus	Butterfly Flower.....	Fair	Incomplete; had not flowered Sept. 29
430F	Delphinium	The Welch Co., Scituate Los Angeles Improved, Annual.....	Poor	Not satisfactory
872F	Tropaeolum	Michael-Leonard Seed Co., Chicago, Ill. Hamilton & Atwater, Inc., Westfield Dwarf Mixed.....	Good	Satisfactory; 3 colors
756F	Celosia	New England Toro Co., West Newton, Mass. Childsi Mixed.....	Good	Satisfactory; 2 colors
757F	Cheiranthus	Siberian Wallflower.....	Good	Satisfactory
754F	Gilia	Capitata (Mixed).....	Poor	Not satisfactory
(D)755F	Hunnemannia	Sunlite.....	Fair	Incomplete; had not flowered Sept. 29
753F	Linaria	Mixed Hybrids.....	Poor	Not satisfactory
Northrup, King & Co., Minneapolis, Minn.				
421F	Gypsophila	Cohasset Hardware Co., Cohasset Annual, Paris Market.....	Good	Satisfactory
(D)611F	Nemophila	Blue.....	Fair	Satisfactory
616F	Verbena	Mammoth Flowering Scarlet Spectrum Red.....	Poor	Not satisfactory
612F	Cynoglossum	F. W. Woolworth Co., Northampton Dwarf Firmament.....	Fair	Satisfactory
613F	Delphinium	Los Angeles Improved Annual.....	Poor	Not satisfactory
615F	Dianthus	Double Mixed.....	Good	Satisfactory; 7 colors
614F	Petunia	Rosy Morn.....	Good	Satisfactory
The Page Seed Co., Greene, N. Y.				
745F	Alyssum	George E. Warren Hardware Co., Braintree Sweet White.....	Fair	Satisfactory
744F	Callistephus	Aster, Heart of France.....	Fair	Incomplete; had not flowered Sept. 29
742F	Celosia	Plumosa and Cristata Mixed.....	Good	Satisfactory; chiefly Cristata forms
743F	Mirabilis	Four O'Clock Mixed Colors.....	Good	Satisfactory; 5 color

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Perry Seed Co., Boston, Mass.				
(D)273F	Calendula	Double Finest Mixed.....	Good	Satisfactory; 5 colors
274F	Callistephus	Aster American Branching Mixed....	F	Incomplete; had not flowered Sept. 29
277F	Centaurea	Cyanus Blue Boy.....	Good	Satisfactory
275F	Cosmos	Sensation Giant Early Flowering Mixed.....	Fair	Satisfactory; 4 colors
278F	Delphinium	Giant Imperial Choice Mixed.....	Poor	Not satisfactory
276F	Iberis	Candytuft Giant White Perfection ..	Good	Satisfactory
280F	Petunia	Choice Bedding Mixed.....	Fair	Satisfactory; 9 colors
279F	Zinnia	Dahlia-flowered Golden State.....	Good	Satisfactory
Ralston Purina Co., St. Louis, Mo.				
Checkerboard Feed Store, Westfield				
879F	Cosmos	Mixed.....	Good	Satisfactory; 3 colors
878F	Dimorphotheca	African Daisy.....	Fair	Incomplete; had not flowered Sept. 29
876F	Iberis	Candytuft Mixed.....	Good	Incomplete; defoliated by insects
875F	Mirabilis	Four O'Clock Mixed.....	Fair	Satisfactory; 2 colors
880F	Tagetes	African Tall Mixed.....	Fair	Incomplete; had not flowered Sept. 29
877F	Zinnia	California Giants Mixed.....	Fair	Satisfactory; 7 colors
Jerome B. Rice Seed Co., Cambridge, N. Y.				
Lake Hardware Co., Arlington				
500F	Linaria	Superb Mixed.....	Fair	Satisfactory; 4 colors
Manchester Forbes Co., Easthampton				
855F	Tagetes	French Dwarf Mixed.....	Good	Satisfactory; 4 colors
Sears, Roebuck & Co., Northampton				
606F	Mathiola	Stock, Large Flowered Mixed.....	Fair	Incomplete; had not flowered Sept. 29
Wadsworth Howland & Co., Inc., Boston				
654F	Centaurea	Dusty Miller.....	Fair	Satisfactory
649F	Dahlia	Unwin's Dwarf Hybrids.....	Poor	Not satisfactory
650F	Eschscholtzia	California Poppy Extra Golden.....	Good	Satisfactory
652F	Malcomia	Virginian Stock.....	Good	Satisfactory; 3 colors
651F	Salpiglossis	Mixed.....	Good	Incomplete; had not flowered Sept. 29
653F	Zinnia	Indian Summer Mixed.....	Good	Satisfactory; 5 colors
Western Auto Supply Co., Quincy				
309F	Callistephus	Aster Ostrich Plume Mixed.....	Poor	Not satisfactory
308F	Tagetes	Marigold Harmony.....	Good	Satisfactory
J. B. Rice, Jr., Inc., Shushan, N. Y.				
C. F. Jordan Co., Bridgewater				
435F	Centaurea	Imperial Sweet Sultan.....	Good	Incomplete; had not flowered Sept. 29
431F	Chrysanthemum	Tricolor, Annual, Single, Mixed.....	Poor	Not satisfactory
432F	Cynolossium	Annual Chinese Forget-me-not.....	Fair	Satisfactory
434F	Nigella	Annual Love-in-a-mist.....	Poor	Not satisfactory
433F	Reseda	Mignonette Machet Annual.....	Fair	Satisfactory
Ross Bros., Co., Worcester, Mass.				
(D)627F	Ageratum	Blue Perfection.....	Good	Incomplete; had not flowered Sept. 29
(D)636F	Callistephus	Aster Super Giant El Monte.....	Fair	Incomplete; had not flowered Sept. 29
628F	Celosia	Cockscomb Glasgow Prize.....	Good	Satisfactory
630F	Ipomoea	Morning Glory Heavenly Blue.....	Good	Satisfactory
629F	Ipomoea	Morning Glory Pearly Gates.....	Good	Incomplete; had not flowered Sept. 29
632F	Scabiosa	Rosette Tall Double Large Flowered.....	Poor	Not satisfactory
631F	Tagetes	Gigantea Sunset Giants.....	Good	Incomplete; had not flowered Sept. 29
633F	Tagetes	Signata Pumila Dwarf Scotch.....	Fair	Satisfactory
634F	Tropaeolum	Nasturtium Golden Gleam.....	Good	Satisfactory
635F	Zinnia	Dahlia-flowered Oriole.....	Good	Satisfactory
LaPalm Hardware Co., Webster				
899F	Cosmos	Early Flowering Mixed.....	Poor	Not satisfactory
897F	Eschscholtzia	California Mixed.....	Good	Satisfactory; 5 colors
900F	Nigella	Blue and White Mixed.....	Poor	Not satisfactory
896F	Papaver	Shirley Mixed Double.....	Poor	Not satisfactory
898F	Reseda	Mignonette Sweet.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Sears, Roebuck & Co., Chicago, Ill.				
		Sears, Roebuck & Co., Northampton		
609F	Alyssum	White Sweet	Good	Satisfactory
607F	Eschscholtzia	California Poppy	Good	Satisfactory; 4 colors
(D)608F	Mirabilis	Baby Blue Eyes	Poor	Not satisfactory
610F	Zinnia	Fantasy Mixed	Good	Satisfactory; 9 colors
Sears, Roebuck & Co., Quincy				
305F	Mathiola	Stock Beauty of Nice	Good	Incomplete; had not flowered Sept. 29
304F	Zinnia	Little Red Riding Hood	Good	Satisfactory
Sears, Roebuck & Co., Westfield				
(D)864F	Ageratum	Blue Perfection	Good	Satisfactory
865F	Calendula	Orange King	Good	Satisfactory
866F	Mirabilis	Four O'Clock Mixed	Fair	Satisfactory; 5 colors
869F	Petunia	Balcony Blue	Poor	Not satisfactory
867F	Tropaeolum	Nasturtium Gleam Hybrids	Good	Satisfactory; 4 colors
Sears, Roebuck & Co., Woburn				
508F	Calendula	Chrysanthemum-flowered	Fair	Satisfactory
509F	Dianthus	Giant Margaret Mixed	Poor	Not satisfactory
510F	Helichrysum	Strawflower Mixed	Good	Incomplete; had not flowered Sept. 29.
Sterling Seed Co., Minneapolis, Minn.				
		W. T. Grant Co., Palmer		
(D)772F	Ageratum	Dwarf Blue Perfection	Good	Incomplete; had not flowered Sept. 29
774F	Calendula	Double Orange King	Fair	Satisfactory
(D)773F	Callistephus	Aster, Crego or Ostrich Plume Red	Fair	Incomplete; had not bloomed Sept. 29
775F	Cosmidium	Yellow & Brown	Good	Satisfactory
781F	Cosmos	Orange Flare	Poor	Not satisfactory
776F	Godetia	Satin Flower Tall Mixed Double	Poor	Not satisfactory
778F	Ipomoea	Morning Glory Crimson Rambler	Good	Satisfactory
777F	Kochia	Childs Mexican Fire Bush	Poor	Not satisfactory
779F	Tropaeolum	Nasturtium Golden Gleam	Fair	Satisfactory
780F	Zinnia	Navajo Mixed	Good	Satisfactory; 11 colors
Templin-Bradley Co., Cleveland, Ohio				
		(Children's Flower Mission)		
		Washington School, Taunton		
(D)465F	Antirrhinum	Snapdragon	Fair	Incomplete; one plant in bloom Sept. 29
462F	Calendula	Scotch Marigold	Poor	Not satisfactory
461F	Centaurea	Bachelor's Button, Double	Fair	Satisfactory
(D)460F	Callistephus	Aster, Extra Quality Mixed	Fair	Incomplete; had not flowered Sept. 29
463F	Petunia	Hybrids Mixed	Good	Satisfactory; 5 colors
464F	Tagetes	African and French, Mixed colors	Poor	Not satisfactory
Vaughan's Seed Store, New York, N. Y.				
		Arnold Fisher Co., Boston		
713F	Alyssum	Little Gem	Poor	Not satisfactory
720F	Antirrhinum	University of California Mixed	Fair	Incomplete; one plant in flower Sept. 29
714F	Callistephus	Aster, Giant Branching Mixed	Fair	Incomplete; had not flowered Sept. 29
(D)715F	Centaurea	Cyanus Blue Boy	Fair	Incomplete; one plant in flower Sept. 29
716F	Cosmos	Orange Flare	Good	Satisfactory
(D)717F	Delphinium	Special Annual Mixture	Fair	Incomplete; had not flowered Sept. 29
718F	Petunia	Blue Boy	Good	Satisfactory
(D)719F	Portulaca	Single Mixed	Good	Satisfactory; 7 colors
721F	Verbena	Mammoth Mixed	Fair	Satisfactory; 10 colors
722F	Zinnia	Red Riding Hood	Good	Satisfactory
The Garden Shop, Wellesley				
399F	Mirabilis	Four O'Clock Mixed	Good	Satisfactory; 4 colors
398F	Petunia	Hybrids Finest Mixed	Good	Satisfactory; 6 colors
400F	Zinnia	Pompon (Lilliput) Mixed	Good	Satisfactory; 8 colors

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 128

JUNE 1946...

**Twenty-sixth Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

During the 1945-46 season, 1,259,623 samples representing 630 chicken and turkey flocks were tested. Compared with the previous season, there were increases in the number of samples (284,582) and the number of flocks (101 tested) yet the average percentage of reactors was the same, 0.12. Flocks tested annually revealed a lower average percentage of reactors than the flocks tested for the first time or intermittently. Progress in eradication of pullorum disease is definitely evident in that 95.3 percent of all birds tested are in 100 percent tested non-reacting flocks.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

TWENTY-SIXTH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1945-46

By the Poultry Disease Control Laboratory¹

INTRODUCTION

The 1945-46 testing season reveals a marked increase (284,582) over the previous year in the volume of tests. The total number of samples tested exceeds the million mark (1,259,623), a new record in the history of the testing work.

It is gratifying to note that even with the marked increases in the number of flocks and birds tested, the percentage of infection has not increased over that of the previous season. Even more encouraging is the fact that 95.3 percent of the birds tested are in 100 percent tested non-reacting flocks. Considering the heavy demands on the poultry industry these last few years and the difficulties under which those demands were met, the Massachusetts poultry industry is to be commended for maintaining standards that are effective in establishing and maintaining pullorum-free flocks. As conditions return to normal and operations can be carried on more satisfactorily, it is hoped that flock owners will be even more vigilant in keeping pullorum disease out of their flocks.

During the past season, the testing work was carried on under extreme difficulties due to a lack of adequate help and facilities. Consequently some flock owners were unable to obtain testing service on approximately the date that was requested. The postponement of the testing of flocks created a hardship and financial loss to the flock owner because his hatching plans and operations were delayed or disrupted.

The marked increase in the volume of testing has been a severe strain on the laboratory personnel, especially the permanent staff. This was further aggravated by the extraordinary pressure from flock owners to get their flocks tested by a certain date. In order to avoid a repetition of the last few years in meeting these heavy testing demands from the industry, increased facilities and additional personnel are imperative.

It should be realized that the Massachusetts poultry industry has made considerable growth in the last ten years, but the facilities and personnel for the pullorum disease testing have not been provided for in direct proportion. Every effort should be put forth to safeguard what has been established on Massachusetts poultry farms; namely, pullorum-free flocks — a quality product that has received universal recognition.

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor; K. L. Bullis, Assistant Veterinary Pathologist; O. S. Flint, Assistant Research Professor; F. G. Sperling, Assistant Research Professor; Miriam K. Clarke, Research Assistant; Felicia Jewett, Laboratory Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

SUMMARY OF SERVICE RENDERED

Applications received.....		692
Applications cancelled.....		62
Flocks tested.....		630
Chicken flocks.....	527	
Chicken and turkey flocks.....	11	
Turkey flocks.....	92	
Number of tests.....		1,259,623
Chickens:		
Routine.....	1,184,427	
Experimental.....	41,167*	
Fowl other than chickens:		
Routine.....	25,436	
Experimental.....	8,593	
Owners receiving necropsy service.....		99**
Necropsies of reacting birds.....		231***

*Includes 2,724 fowl typhoid tests.

**Includes 11 turkey flocks.

***Includes 27 turkeys.

DISTRIBUTION OF TESTS AND REACTORS

Table 1 gives the number of tests and reactors by counties. Flock owners in 12 counties were given testing service. A total of 1,225,594 samples was tested which revealed 0.12 percent reactors. In only one county, Dukes, were no reactors found among the birds tested. However, seven counties (Barnstable, Bristol, Essex, Middlesex, Norfolk, Plymouth, and Worcester) had either 0.1 percent or less reactors among the samples tested. Bristol, Middlesex, Norfolk, Plymouth, and Worcester counties led in the number of samples tested, all exceeding 150,000. Middlesex county had the largest number of tests, 224,109. This number approaches the total number of samples tested in the entire State 13 years ago (1933-34).

The following breeds were tested: Bantam, Barnevelder, Barred Plymouth Rock, Brahma, Crosses, Dark Cornish, Jersey White Giant, New Hampshire, Rhode Island Red, White American, White Leghorn, White Plymouth Rock, and White Wyandotte. Reactors were detected among the Rhode Island Reds, Barred Plymouth Rocks, White Plymouth Rocks, New Hampshires, and Crosses. The three leading breeds in Massachusetts are Rhode Island Red, New Hampshire, and Barred Plymouth Rock. Of the total samples tested 57.7 percent were taken from the Rhode Island Red, 19.3 percent from New Hampshire, and 18.5 percent from the Barred Plymouth Rock. The balance was taken from the other breeds listed.

Of the 1,112,569 samples collected from females, 79,113 were from hens and 1,033,456 from pullets. The incidence of reactors was higher among the hens (0.27 percent) than among the pullets (0.11 percent). The 113,025 samples tested from males showed 0.12 percent as reactors. The incidence of reactors among males was about the same as among pullets.

ANNUAL TESTING OF FLOCKS

The results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years are given in Table 2.

Table 2. Annual Testing Versus Single and Intermittent Testing.

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially Tested	100% Tested	Partially Tested
Flocks tested—									
For the first time.....	113	136,658	139,607	448	0.32	100	8	5	—
Intermittently.....	37	113,176	127,975	349	0.27	30	—	6	1
Two consecutive years.....	81	157,958	179,423	210	0.12	77	—	4	—
Three or more consecutive years.....	307	717,945	778,589	443	0.06	291	7	9	—
Totals.....	538	1,125,737	1,225,594	1,450	0.12	498	15	24	1

The number of flocks tested for the first time exceeds the number tested intermittently and for two consecutive years, and the average percentage of reactors was higher than for any other group. However, it is particularly encouraging that all but five flocks were found to be negative. Also, 95 percent of the birds tested in this group were in flocks identified as negative. The average number of birds per flock in this group was 1,209.

In the intermittent group are listed seven infected flocks. Of the birds tested in this group, 91 percent are in non-reacting flocks, which is a lower percentage than in the other groups. These results substantiate previous reports that intermittent testing is not a sound procedure in establishing or maintaining a non-reacting flock. The average number of birds per flock in this group was 3,059.

In the flocks tested for two consecutive years, 97 percent of the birds tested are in non-reacting flocks. This exceeds the percentage in the groups tested for the first time and intermittently. The average number of birds per flock in this group was 1,949.

The group tested for three or more consecutive years is by far the largest of the four groups. It also has the lowest average percentage of reactors as well as the largest number of negative flocks and of birds in such flocks. Approximately 97.4 percent of the birds tested in this group are in non-reacting flocks, which is indeed very encouraging. The average number of birds per flock in this group was 2,339.

For the four groups as a whole, 538 flocks were tested, representing 1,125,737 birds and 1,225,594 samples, of which 0.12 percent were positive. The 498 flocks which were 100 percent tested and non-reacting contained 1,073,565 birds or 95.3 percent of the total birds tested. This is 2 percent higher than the previous season in spite of the marked increase in the number of birds tested this season.

The number of positive flocks, 25, was two less than in 1944-45. The number of tested birds, 40,011, in positive flocks was also less than the previous season. Approximately 3.6 percent of the birds tested are in positive flocks. It is hoped that the downward trend in the number of positive flocks will continue. Owners of infected flocks are advised not to breed from such flocks until all of the infection has been eliminated from the premises either through intensive retesting or by flock replacement with pullorum-free stock.

It should be noted that 70 of the flocks tested in 1944-45 (approximately 15 percent) were not tested in 1945-46. Annual testing of all birds on the premises should be observed by every flock owner who operates a breeding flock.

It is of interest to compare the results presented above with those of the previous season, as listed in the following summary:

Classification of flocks	1944-45	1945-46	Change	
			Increase	Decrease
Tested for the first time:				
Flocks.....	88	113	25	
Birds.....	97,063	136,658	39,595	
Percent positive*.....	0.40	0.32		0.08
Negative flocks.....	80	108	28	
Birds in negative flocks.....	89,851	130,258	40,407	
Positive flocks.....	8	5		3
Birds in positive flocks.....	7,212	6,400		812
Tested intermittently:				
Flocks.....	30	37	7	
Birds.....	62,381	113,176	50,795	
Percent positive*.....	0.42	0.27		0.15
Negative flocks.....	23	30	7	
Birds in negative flocks.....	41,082	102,623	61,541	
Positive flocks.....	7	7		
Birds in positive flocks.....	21,299	10,553		10,746
Tested for two consecutive years:				
Flocks.....	80	81	1	
Birds.....	107,267	157,958	50,691	
Percent positive*.....	0.15	0.12		0.03
Negative flocks.....	76	77	1	
Birds in negative flocks.....	103,067	153,184	50,117	
Positive flocks.....	4	4		
Birds in positive flocks.....	4,200	4,774	574	
Tested for three or more consecutive years:				
Flocks.....	260	307	47	
Birds.....	569,770	717,945	148,175	
Percent positive*.....	0.03	0.06	0.03	
Negative flocks.....	252	298	46	
Birds in negative flocks.....	558,551	699,661	141,110	
Positive flocks.....	8	9	1	
Birds in positive flocks.....	11,219	18,284	7,065	

*Based on number of tests.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

In Table 3 are listed the testing results of flocks which had been non-reacting for one or more years but showed infection in 1945-46. Twenty "breaks" were detected, which is one less than occurred the previous year. Fourteen flocks had less than 0.5 percent reactors on the first test; two flocks (5 and 10) had more than 1 percent reactors; and the remaining four flocks had between 0.5 and 1 percent reactors. Nine flocks had five reactors or less on the original test of the flock.

Table 3. Appearance of Infection in Flocks Previously Negative

Flock	Number of Years Negative	1945-46 Season		Positive Tests Percent	Explanation for Infection
		Flock Total	Number Tested		
1	1	7,493	7,491	0.79	Unknown
		999	999*	0.00	
		962	959*	0.00	
2	10	1,176	1,176	0.09	Unknown
		1,016	1,016*	0.00	
3	2	2,988	2,988	0.07	Purchased questionable stock
		2,988	189*	1.06	
4	4	6,613	6,609	0.18	Unknown
		6,613	5,203 ^c	0.06	
5	1	1,008	958	3.86	Purchased questionable stock
6	1	2,142	2,142	0.23	Purchased infected stock
7	1	1,768	1,768	0.28	Unknown
		1,368	1,367*	0.00	
8	1	660	660	0.76	Inadequate preventive measures
9	1	7,007	7,007	0.13	Unknown
		6,640	6,640*	0.05	
		6,640	1,026*	0.00	
		5,443	6,440*	0.00	
		6,400	892*	0.00	
10	9	1,166	1,111	1.35	Unknown
11	1	2,971	1,771	0.06	Questionable stock
		1,613	1,611*	0.00	
12	1	3,417	3,417	0.88	Purchased infected stock
		3,417	1,512*	0.00	
13	3	769	768	0.08	Unknown
		731	710*	0.00	
14	17	3,201	3,201	0.06	Unknown
		3,201	3,066*	0.00	
		3,201	367*	0.00	
15	1	7,578	7,578	0.33	Inadequate preventive measures
			443*	0.00	
			1,134*	0.53	
			2,969*	1.08	
			1,962*	0.05	
		1,816*	0.00		
16	15	3,589	3,589	0.20	Unknown
		3,589	3,045*	0.00	
17	4	2,634	2,584	0.08	Unknown
		2,547	2,546*	0.00	
18	4	1,426	1,396	0.86	Questionable stock
		1,310	1,290*	0.00	
19	1	9,641	9,638	0.03	Unknown
		5,812	5,811*	0.00	
20	3	3,342	3,342	0.24	Inadequate preventive measures
		3,342	1,557*	0.00	

*Retests

Ten flocks had been non-reacting for one year, one for two years, two for three years, three for four years, and one each for nine, ten, fifteen, and seventeen years.

The source of the infection was unknown in 11 flocks. In the nine remaining flocks, the purchase of infected or questionable stock, and inadequate preventive measures were responsible for the "breaks."

Thirteen flocks regained their negative status through retesting, whereas three failed to do so. The remaining four were not retested.

The problem of the appearance of pullorum infection in flocks previously negative should be of great concern to all breeders. "Breaks" may be very costly to the flock owner. Every precaution should be taken to prevent the introduction of infection. This requires constant vigilance on the part of the flock owner. The following measures cannot be stressed too strongly in establishing and maintaining a pullorum-free flock:

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment, should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.
7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult your county agent regarding additions or replacements in your flock.
8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.
9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.
10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).
11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.
12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)
13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.
14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING OF FOWL OTHER THAN CHICKENS

It is of interest to note that, while there was a great increase in the number of chickens tested during the past season, the number of turkeys tested was slightly less than that of the previous season. This may be explained by the shortage in feed and the Government's request that the turkey industry decrease its production. This development was not announced until the bulk of the chickens had been tested and before the time turkeys usually are tested. However, 103 turkey flocks, representing 21,473 birds, were tested, including 11 flocks which were on farms with tested chickens.

The following table summarizes the results of testing fowl other than chickens:

Fowl	Number of Birds	Reactors		Number of Tests	Reactors	
		Number	Percent		Number	Percent
Turkeys.....	21,473	298	1.39	32,917	744	2.26
Guineas.....	7	0		9	0	
Ducks.....	39	0		39	0	
Geese.....	75	0		75	0	
Pheasants.....	977	0		977	0	
Game.....	7	0		7	0	
Pigeons.....	5	0		5	0	
Totals.....	22,583	298		34,029	744	

The percentage of reactors among turkeys is less than that of last year (2.83 percent). These reactors were confined to 12 flocks, representing 6,045 birds. The percentages of reactors ranged from 0.83 to 55.56. In a few infected flocks, retesting was conducted, but the results were not as satisfactory as with chickens.

The following summary gives the range in flock sizes for the turkey flocks tested:

Size of Flock	Number of Flocks
0-50	36
51-100	19
101-150	11
151-200	7
201-500	16
501-1000	13
1001-2000	0
2001 and more	1

Five of the 12 infected flocks had 200 or more birds tested on the premises. Approximately 25 percent of the tested birds are in infected flocks, which should be of great concern to the Massachusetts turkey industry. A more conscientious effort should be made to eliminate pullorum disease from the various breeding flocks in Massachusetts. A more effective educational and testing program should

be instituted and followed. Likewise, more careful buying of stock (eggs, poults, mature birds) should be strongly emphasized. Raising of chickens and turkeys on the same premises should be discouraged unless both types of fowl are subjected to the pullorum testing requirements. Custom hatching of turkey eggs should be discouraged unless the eggs are free of pullorum infection. The turkey breeder should follow the same pullorum measures as have been outlined for chickens under the previous section.

NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

The non-reacting and positive flocks are classified by counties in Table 4. A total of 513 non-reacting flocks, representing 1,085,726 birds, was detected in 12 counties. Of this total, 498 flocks, representing 1,073,565 birds, were 100 percent tested and 15, representing 12,161 birds, were partially tested. Middlesex, Worcester, and Plymouth counties have the largest number of birds in non-reacting flocks. In Dukes and Essex counties, all tested flocks were classified as negative at the end of the season.

Table 4. Nonreacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable.....	2	4,629	—	—	2	4,629
Berkshire.....	6	9,385	—	—	6	9,385
Bristol.....	65	127,631	3	1,137	68	128,768
Dukes.....	1	2,435	—	—	1	2,435
Essex.....	65	140,660	3	953	68	141,613
Franklin.....	26	43,276	—	—	26	43,276
Hampden.....	25	29,302	—	—	25	29,302
Hampshire.....	29	40,437	1	111	30	40,548
Middlesex.....	92	202,825	2	2,424	94	205,249
Norfolk.....	36	134,309	2	3,688	38	137,997
Plymouth.....	62	154,245	4	3,848	66	158,093
Worcester.....	89	184,431	—	—	89	184,431
Totals.....	498	1,073,565	15	12,161	513	1,085,726
Positive Flocks						
Barnstable.....	1	1,817	—	—	1	1,817
Berkshire.....	2	4,573	—	—	2	4,573
Bristol.....	6	12,551	—	—	6	12,551
Franklin.....	4	5,282	—	—	4	5,282
Hampden.....	1	1,960	1	1,031	2	2,991
Hampshire.....	3	3,969	—	—	3	3,969
Middlesex.....	2	1,163	—	—	2	1,163
Norfolk.....	1	2,161	—	—	1	2,161
Plymouth.....	3	4,393	—	—	3	4,393
Worcester.....	1	1,111	—	—	1	1,111
Totals.....	24	38,980	1	1,031	25	40,011

Twenty-five flocks were classified as positive at the close of the season. The number of birds represented was 40,011, which is 3.6 percent of the total birds tested.

Of the total flocks tested 92.5 percent were 100 percent tested. In five counties (Barnstable, Berkshire, Dukes, Franklin, and Worcester), all flocks were 100 percent tested. Only 16 flocks, representing 13,192 birds, were partially tested.

These results show that Massachusetts has a large supply of pullorum-free stock well distributed throughout the State. It is hoped that these pullorum-free sources will be utilized to the fullest extent in replacing flocks throughout the Commonwealth. Every effort should be put forth to eradicate the remaining reservoirs of infection that may exist in the State. Much can be accomplished in this direction by following an effective testing program, maintaining vigilance in keeping out diseases, and educating the buying public in regard to the value and source of pullorum-free stock.

Table 5. Comparison of 1944-45 and 1945-46 Testing

County	Flock	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1944-45 Season					
Barnstable.....	3	5,588	5,588	0.07	2
Berkshire.....	4	9,028	9,028	0.00	4
Bristol.....	58	111,716	132,647	0.02	56
Dukes.....	1	2,206	2,206	0.00	1
Essex.....	66	116,309	119,207	0.05	62
Franklin.....	24	40,423	42,445	0.05	21
Hampden.....	18	20,052	24,716	0.20	18
Hampshire.....	28	30,808	33,830	0.12	26
Middlesex.....	95	178,129	184,251	0.12	89
Norfolk.....	30	64,770	69,560	0.10	28
Plymouth.....	50	107,607	139,370	0.43	45
Worcester.....	81	149,845	181,139	0.008	79
Totals.....	458	836,481	943,987	0.12	431
1945-46 Season					
Barnstable.....	3	6,446	7,959	0.06	2
Berkshire.....	8	13,958	15,515	0.67	6
Bristol.....	74	141,319	163,903	0.07	68
Dukes.....	1	2,435	2,435	0.00	1
Essex.....	68	141,613	147,877	0.009	68
Franklin.....	30	48,558	48,617	0.37	26
Hampden.....	27	32,293	34,763	1.01	25
Hampshire.....	33	44,517	48,189	0.54	30
Middlesex.....	96	206,412	224,109	0.05	94
Norfolk.....	39	140,158	156,982	0.06	38
Plymouth.....	69	162,486	181,818	0.10	66
Worcester.....	90	185,542	193,427	0.02	89
Totals.....	538	1,125,737	1,225,594	0.12	513

COMPARISON OF 1944-45 AND 1945-46 TESTING

Table 5 gives the comparison of the 1944-45 and 1945-46 testing results for the different counties. Increases in the number of tested flocks and non-reacting flocks were observed in 10 counties. In all counties increases were observed in the number of tested birds. Six counties had an increase in the percentage of infection, five counties had a decrease, and one had no change.

For the State as a whole, a comparison of the results for the past two years is given in the following summary:

	1944-45	1945-46	Increase
Tested flocks.....	458	538	80
Tested birds.....	836,481	1,125,737	289,256
Tests.....	943,987	1,225,594	281,607
Non-reacting flocks.....	431	513	82
100 percent tested, non-reacting flocks.....	413	498	85
Birds in 100 percent tested, non-reacting flocks	776,089	1,073,565	297,476
Infected flocks.....	27	25	Minus 2
"Breaks".....	21	20	Minus 1

These results show that the testing volume increased markedly during the past year. It is hoped that the percentage of infection, the number of infected flocks, and the number of "breaks" can be reduced.

The results also indicate that the poultry population is relatively free of pullorum disease because, as the number of new flocks tested increases over the previous seasons, a very small number of infected flocks is found. It should not be construed from the foregoing statement that it is unnecessary to test each year. As long as there are foci of infection within the State and the introduction of infection into the State is not prohibited, flock owners should recognize that annual testing is necessary to determine whether the infection may have spread to their flocks. It is hoped that sometime in the future the disease will have been sufficiently eradicated to permit flocks to go untested for one, two, or three years. If such a program were possible, it would be an economic saving to the industry.

TWENTY-SIX YEAR TESTING SUMMARY

A 26-year testing summary is presented in Table 6. Continued progress in testing and in the control and eradication of the disease is noted from the results listed in the table. For the last six years, the number of birds in non-reacting flocks, expressed in terms of percentage of total birds tested, has not been below 90.

Table 6. Twenty-Six Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests	Non-reacting	Birds in Non-reacting Flocks	
				Percent	Flocks	Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: The importance of testing all birds on the premises annually has been recognized for many years. It is apparent that the true pullorum status of a flock cannot be determined by testing only part of the birds in the flock. Furthermore, it cannot be assumed that a flock which has passed a negative test will remain negative. The fact that "breaks" occur is sufficient evidence to indicate the necessity of annual testing.

This past season there were 37 flocks, representing 113,176 birds, with an intermittent testing history. This was approximately 10 percent of the total birds tested. It is hoped that the number of intermittently tested flocks may be kept at a very low minimum, because a sound breeding program includes the annual testing of flocks.

A total of 16 flocks was only partially tested the past season. The number of birds tested in these flocks was 13,192. Again it may be emphasized that testing only part of the flock does not give the true pullorum picture of the flock. It is essential in a sound breeding program to test all the birds on the premises even though the untested birds may not be used for breeders. It should

be recognized that pullorum infection can spread among mature birds. Maintaining tested and untested birds in separate houses is not sufficient protection against the spread of the disease on the average commercial poultry farm. In states that have adopted the practice of testing all birds on the premises, the effort has been very fruitful in establishing and maintaining pullorum-free flocks.

Poultrymen who have experienced pullorum "breaks" in their flocks realize that it is costly. However, many of these "breaks" could be avoided through more careful management. "Breaks" may completely ruin a poultryman's hatching season. Sometimes the infection can be eliminated before the start of the hatching season, especially if it is detected early in the testing year. Careful and conscientious observance of the preventive measures listed in a previous section will pay the flock owner very good dividends in maintaining a pullorum-free flock.

Early Testing: Last season a number of poultrymen were disappointed because they could not have their flocks tested at a desired time. This was due to a number of factors but the laboratory made every effort to test as many birds as was possible in the allotted time. It has been called to the attention of the poultrymen, prior to this past season, that the laboratory facilities can accommodate only a limited number of samples at a given time. If more requests for testing are received for that given time than the laboratory can accommodate, it means the work will have to be either postponed or cancelled. The following summary shows the number of tests requested by months and the number of samples tested by months:

Month	Tests Applied For	Tests Completed
April, 1945		21,043
May.....		4,711
June.....	16,952	12,662
July.....	45,138	39,193
August.....	89,814	56,672
September.....	204,125	111,783
October.....	225,563	176,489
November.....	291,634	192,378
December.....	143,289	162,684
January, 1946.....	58,397	197,792
February.....	34,833	166,895
March.....	6,440	117,321

Among the requests for early testing, the number of postponements was quite large, which did not help the laboratory to complete a certain volume of work during the early part of the season.

It is evident that if some of the testing work could be advanced from the peak months of October, November, December, and January into July, August, and September, a more satisfactory service could be rendered. The laboratory has no serious objection to "split flock" testing if proper precautions can be taken to

keep the tested and untested units distinctly separate. Poultrymen should understand that as soon as birds are five months of age, they are officially eligible for the test. Furthermore, it is sound policy to test birds before their eggs are saved for hatching. If this principle were followed by flock owners, a great many of the birds would be tested during the first months of the testing season rather than during the very congested months.

It is hoped that flock owners will cooperate to the fullest extent in order that high quality service may be extended to the greatest number possible under existing circumstances

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AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 129

JULY 1946

**Inspection of Commercial
Feedstuffs**

By Feed Control Service Staff

This, the fifty-second report of feeding stuffs inspection, contains, in addition to information required by statute, carotene determinations on alfalfa products and other data of importance in determining the value of a feedstuff.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

Philip H. Smith,¹ *Official Chemist
in Charge*
John W. Kuzmeski, *Official Chemist*
Albert F. Spelman, *Senior Chemist*
C. Tyson Smith, *Assistant Chemist*

Henry B. Rodman, *Junior Chemist*
Frederick A. McLaughlin, *Microscopist*
James T. Howard, *Inspector*
Joseph A. Martell, *Technical Assistan*
Cora B. Grover, *Senior Clerk*

¹Retired.

This publication contains the analysis of official samples of ready mixed feeds found on the Massachusetts markets between September 1, 1945, and April 1, 1946. While feed ingredients were to some extent sampled and analyzed, the results are not published on account of the small volume found. Many brands of feed new to the Massachusetts markets were offered, owing in most instances to the fact that the manufacturers best known to New England were often compelled to hunt out new sources of supply so urgently needed. These were registered under the original manufacturer's name.

Compliance with guarantees was remarkable when the scarcity of some ingredients, especially protein concentrates, is considered. At times attached guarantees did not match either the registration or the contents of the sack, which can be considered excusable when the vital problem was to get feed into the market rather than to hold it until correct guarantee labels could be secured.

Nutritional knowledge is far ahead of the requirements of any feed law. The present statute should be revised in order to give recognition to the advance in nutritional science. The present statute is based entirely on guarantees of protein, fat, fiber, and ingredient content. Frequently, feeding stuffs carry guarantees of vitamin and mineral ingredient content. No protection under the law is afforded from the manufacturer who chooses to misrepresent the facts in these respects.

While not of immediate interest to Control Service, have not feed conditions during the war and in the period immediately following suggested to Massachusetts dairy and poultry farmers that even greater attention must be paid to home grown feeds? For the last fifty years a greater and greater dependence has been placed upon western grain products which under the circumstances has proved economical. Such supplies are now practically out of the market, whether permanently or temporarily, no one knows. With improved roughage and more attention to grain crops, especially corn, it is believed that the need for purchased grain can be greatly reduced. Such practice may eventually prove a necessity.

In setting up the analysis tables an attempt has been made to use the guarantees actually attached to the commodity rather than to use the registered guarantees which may have been changed several times during the period of registration because of the scarcity of some ingredients ordinarily used. Where the name of a firm or part of the firm name has been used as the brand name this has been omitted in the tables unless in the listing some confusion might be caused by the omission.

Complete Average Analyses of Commercial Feeds Collected (Per Cent)

Num- ber of Analy- ses	Manufacturer and Brand	Water	Protein		Fat		Nitro- gen Free Ex- tract	Fiber		Ash
			Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	
1	Acme Milling Co. Golden Dairy Feed 18%	13.7	13.7	18.0	4.1	3.5	55.0	5.3	9.0	8.2
1	Acme-Evans Co., Inc. Acme Feed	10.5	15.1	15.0	4.5	3.5	56.7	7.9	10.0	5.3
1	Allied Mills, Inc. Economy 16% Dairy Ration	10.6	18.9	16.0	4.1	3.0	48.0	10.9	13.0	7.5
2	Wayne All Mash Egg	11.3	16.4	15.0	3.2	3.0	55.1	6.7	8.0	6.5
4	Wayne Breeder Mash	11.4	20.9	20.0	4.5	3.5	47.3	7.4	8.0	8.5
1	Wayne Broiler Mash	11.8	19.7	19.0	4.1	3.0	48.8	7.5	7.0	8.1
1	Wayne Chick Starter	11.8	18.5	18.0	3.6	3.0	53.6	7.0	7.0	5.5
1	Wayne Chick Starter	11.8	19.8	20.0	4.7	3.0	50.6	5.8	7.0	7.3
2	Wayne Chick & Broiler Ration	11.6	20.3	19.0	4.1	3.0	50.3	6.6	8.0	7.1
1	Wayne Complete Calf Feed	11.6	17.9	16.0	3.8	3.0	50.6	8.2	9.0	7.9
4	Wayne 20% Dairy Ration	10.8	21.3	20.0	4.8	3.0	47.7	8.0	10.0	7.4
3	Wayne 16% Dairy Ration	11.3	17.6	16.0	3.8	3.0	53.3	7.5	9.0	6.5
3	Wayne Egg Mash	11.2	20.9	20.0	3.7	3.0	49.9	7.4	8.0	6.9
2	Wayne Fitting Ration	11.1	15.2	12.0	4.2	3.0	54.6	8.1	9.0	6.8
2	Wayne Flushing Mash	10.8	22.8	20.0	3.7	3.0	49.9	3.0	6.0	8.9
2	Wayne Growing Mash	11.8	17.0	16.0	3.6	3.0	54.7	6.9	8.0	6.0
3	Wayne Horse Feed	13.5	10.6	9.5	3.5	2.5	61.3	7.7	10.0	3.4
1	Wayne 26% Mash Supplement	9.0	26.7	26.0	4.4	3.0	38.0	8.8	10.0	13.1
1	Wayne Pork Maker	12.1	15.0	14.0	3.3	3.0	57.4	5.4	7.0	7.8
3	Wayne Turkey Growing Mash	11.7	21.4	20.0	4.1	3.0	48.7	7.1	8.0	7.0
1	Wayne Turkey Starting Mash	10.4	25.4	25.0	5.0	3.5	43.2	7.9	8.0	8.1
4	American Flours, Inc. Blue Tag Feed	13.0	15.3	13.5	4.4	3.5	54.7	7.5	11.0	5.1
1	A. P. Ames & Co. Complete Cycle Ration	10.7	17.6	16.0	3.9	3.0	53.5	6.7	6.0	7.6
1	Egg Mash	10.2	21.7	20.0	5.4	4.0	44.6	7.0	7.0	11.1
1	20% Milk Maker	11.3	22.5	20.0	3.3	4.0	44.9	8.1	10.0	9.9
1	Starter & Broiler	9.9	20.4	19.5	4.8	4.0	47.0	6.8	7.0	10.5

E. W. Bailey & Co.											
1	1	Pennant Brand Breeder Mash	10.9	19.7	20.0	3.8	3.0	50.6	7.4	7.0	7.6
1	1	Pennant Brand Broiler Mash	11.7	20.9	20.0	4.5	3.0	48.5	7.1	7.0	7.3
1	1	Pennant Brand Calf Ration	12.9	15.1	15.0	4.6	3.0	53.3	8.2	8.5	5.9
1	1	Pennant Brand Complete Egg Ration	11.4	15.2	16.0	2.9	3.0	55.4	7.0	7.0	7.5
1	1	Pennant Brand Complete Grower	11.6	15.3	15.0	3.1	3.0	55.3	7.3	7.0	7.4
1	1	Pennant Brand 16% Dairy Ration	11.6	17.6	16.0	3.8	3.0	54.1	7.2	8.0	5.7
1	1	Pennant Brand Fitting Ration	12.6	15.0	14.0	3.7	3.0	57.3	6.8	7.5	4.6
1	1	Pennant Brand Growing Mash	11.4	18.0	18.0	3.4	3.0	52.5	7.0	7.0	7.0
1	1	Pennant Brand Laying Mash	10.7	20.8	20.0	3.3	3.0	48.7	7.7	7.0	8.8
Barber & Bennett, Inc.											
2	2	Fort Orange Broiler Mash	10.9	19.2	18.0	4.3	4.0	50.5	6.6	7.0	8.5
1	1	Fort Orange 12% Fitting and Calf Gain Ration	12.6	13.6	12.0	3.7	4.0	55.9	7.4	8.5	6.8
1	1	Fort Orange Golden Test Ration	11.5	17.5	18.0	4.5	4.5	52.8	8.2	8.5	5.5
1	1	Fort Orange Growing Mash	11.0	17.0	17.0	4.1	4.0	52.2	7.1	7.0	7.5
3	3	Fort Orange Laying Mash	10.8	20.1	19.0	4.3	4.0	48.3	7.1	8.0	9.4
2	2	Fort Orange Milk Ration	12.7	17.7	16.0	4.7	4.0	51.2	8.3	9.0	5.4
Beacon Milling Co., Inc.											
1	1	Calf Grain	14.2	13.8	14.0	4.2	4.0	53.6	7.8	10.0	6.4
2	2	Complete Starting Ration	13.0	21.4	20.0	4.3	3.5	49.1	4.9	6.5	7.3
1	1	Duck Grower Pellets	10.8	17.8	17.0	4.3	3.0	52.8	6.7	6.0	7.6
1	1	Duck Starter Pellets	10.8	17.9	17.0	5.7	3.0	51.7	6.7	6.0	7.2
1	1	Fitting Ration	13.6	14.1	14.0	4.0	3.5	52.5	8.9	8.0	6.9
1	1	Fleshing Pellets	11.7	21.6	20.0	3.8	3.5	47.6	5.4	7.5	9.9
2	2	Goat Ration	12.7	16.9	16.0	4.1	3.5	51.5	7.8	10.0	7.0
1	1	Growing Mash	10.4	19.4	18.0	4.8	3.0	47.5	8.2	7.5	9.7
2	2	Special "18"	12.6	19.0	18.0	3.8	3.5	50.1	7.1	9.0	7.1
1	1	Turkey Growing Mash	10.0	22.0	20.0	4.9	3.0	44.4	7.4	7.0	11.3
1	1	Turkey & Game Bird Fitting Ration	12.9	14.0	10.0	2.9	3.0	59.7	6.1	9.0	4.4
Black Brothers Flour Mills											
1	1	Broiler Ration	10.6	16.9	18.0	4.3	3.5	58.6	4.7	5.75	4.9
Blatchley & Ballard, Inc.											
1	1	Bee Brand 16% Dairy Ration	12.0	18.4	16.0	4.8	4.0	49.5	8.6	12.0	6.7
1	1	Bee Brand Hog Ration	12.4	16.2	18.0	3.0	3.5	56.0	5.7	8.0	6.7
2	2	Bee Brand Laying Mash	12.7	15.1	18.0	3.8	4.0	53.9	6.9	6.0	7.6
Borden Grain Co.											
2	2	Dairy Feed	10.4	21.4	22.0	5.0	4.0	48.1	7.0	10.0	8.1
2	2	Laying Mash	10.9	18.4	19.0	5.2	4.0	49.4	7.6	7.0	8.5
2	2	Starter and Growing Feed	10.6	17.7	17.0	4.9	4.0	50.2	7.3	7.0	9.3
Bridgewater Milling Co.											
1	1	18 Per Cent Growing Mash	11.2	19.0	18.0	4.1	4.0	49.0	6.7	7.0	10.0

3	Wirthmore Standard 16 Dairy Ration	11.7	16.7	16.0	4.2	3.0	53.3	7.8	10.0	6.3
4	Wirthmore Standard Horse Feed	13.4	11.5	10.0	4.0	3.25	58.6	8.5	9.0	4.0
4	Wirthmore Stock Feed	12.7	10.1	10.0	3.2	3.0	59.4	8.9	11.0	5.7
2	Wirthmore Turkey Breeder	12.3	24.3	24.0	3.7	3.0	45.1	5.1	7.0	6.5
2	Wirthmore Turkey Fattening Ration	11.3	18.8	16.0	3.6	3.0	55.1	4.7	7.0	6.7
3	Wirthmore Turkey Growing Ration	10.6	21.6	20.0	3.9	3.0	52.0	5.2	7.0	
Crawford Brothers, Inc.										
5	Broiler Mash	11.6	19.4	20.0	4.5	4.0	50.6	6.7	8.0	7.2
1	Duck Growing Pellets	10.3	19.4	19.0	3.4	5.0	49.7	6.4	9.0	10.8
1	Fitting Ration 11 ^{1/2} %	13.6	14.2	11.0	3.3	3.0	55.2	5.4	12.0	8.3
3	Growing Mash	10.8	19.2	18.0	4.0	4.0	52.2	6.1	8.0	7.5
2	Horse Feed	12.1	12.4	9.0	3.9	2.5	57.2	7.6	10.0	6.8
2	Laying Mash	9.5	18.6	18.0	4.0	4.0	53.6	6.4	8.0	7.6
1	Laying Mash	12.5	17.8	20.0	4.5	3.5	51.4	5.5	8.0	8.3
1	Laying-Breeding Mash	11.9	18.6	20.0	4.0	4.0	50.8	6.7	8.0	7.7
3	Pig and Hog Feed	11.9	21.9	18.0	3.5	4.0	49.7	6.9	9.0	8.1
1	Producer 20 ^{1/2} %	10.8	24.8	20.0	3.8	3.0	44.6	7.3	12.0	8.7
2	Range Grower	11.0	19.6	17.0	3.9	4.0	53.3	5.6	8.0	6.6
1	Special Test 18 ^{1/2} %	11.0	20.2	18.0	4.9	4.0	46.7	8.8	10.0	8.4
3	Starting Mash	10.3	20.0	18.0	5.2	4.0	51.1	7.2	8.0	6.2
1	Sweet Walkill 20 ^{1/2} %	10.4	20.7	20.0	3.7	4.0	48.4	8.7	8.0	8.1
2	Turkey Growing Mash	11.6	18.4	26.0	4.2	4.0	51.7	6.4	9.0	7.7
1	Turkey Starting Mash	11.8	20.3	26.0	4.4	4.0	51.0	5.8	9.0	6.7
Crookston Milling Co.										
1	Creomo Dairy Feed	12.0	19.1	20.0	4.6	3.5	51.6	6.4	9.0	6.3
1	Minnesota Maid Egg Mash	10.1	20.5	18.5	4.6	5.0	48.1	7.9	7.0	8.8
Curley Grain & Fuel Co.										
2	Crystal Complete Growing Mash	11.4	17.4	15.0	4.5	4.0	52.0	6.9	6.0	7.8
2	Crystal Complete Laying Mash	11.3	17.1	15.0	4.4	4.0	52.8	6.7	6.0	7.7
2	Crystal Dairy Ration 20 ^{1/2} %	11.2	22.5	20.0	4.2	4.0	44.6	7.7	13.0	9.8
1	Crystal Growing Mash	11.4	19.6	16.0	5.1	4.0	47.2	7.0	7.0	9.7
1	Crystal Laying Mash	10.4	20.4	18.0	4.9	3.5	47.1	6.8	6.0	10.4
2	Crystal Starter and Broiler	10.5	22.0	16.0	5.6	4.0	45.9	6.4	6.0	9.6
Dailey Mills, Inc.										
3	Double Diamond Egg Producer	10.9	20.7	20.0	4.5	3.5	47.5	7.5	7.0	8.9
1	Double Diamond Grower	9.6	20.0	20.0	4.1	3.5	47.1	8.4	7.0	10.8
2	Double Diamond Horse Feed	14.2	10.9	10.0	3.4	3.0	58.2	8.0	8.0	6.1
2	Double Diamond Layer	9.6	22.9	22.0	5.2	3.5	45.5	7.3	7.0	9.5
2	Double Diamond 20 ^{1/2} % Milk Producer	11.5	19.9	20.0	4.4	3.5	46.3	8.6	10.0	9.1
2	Double Diamond 18 ^{1/2} % Milk Producer	10.2	18.4	18.0	4.5	3.5	50.0	7.8	10.0	9.1
1	Double Diamond Pig & Hog Ration	10.5	14.1	13.0	3.7	3.0	51.4	11.3	10.0	9.0
1	Double Diamond Pork Producer	9.7	18.3	17.0	4.4	3.5	49.6	8.3	7.0	9.7
3	Double Diamond Starter Grower	11.0	19.6	18.0	4.4	3.5	48.4	8.0	7.0	8.6
1	Double Diamond Starter Broiler	10.9	21.4	20.0	5.1	3.5	48.7	7.0	7.0	6.9

1	Egg Mash	10.5	20.2	20.0	4.0	2.5	49.1	6.6	8.0	9.6
1	Fitting Ration	11.6	15.7	14.0	4.1	3.0	53.2	9.0	10.0	6.4
1	Flushing	10.8	19.6	18.5	2.3	1.5	54.9	3.6	5.0	8.8
1	Fulphail	10.9	19.9	18.0	4.4	3.5	50.6	7.2	9.0	7.0
2	Horse Feed	13.0	13.0	10.5	3.8	3.0	55.1	9.4	10.0	5.7
1	Pork Builder	11.3	13.5	15.0	3.3	2.5	59.6	4.5	6.5	5.8
1	Sixteen	11.9	17.0	16.0	4.6	3.5	54.5	7.1	9.0	4.9
1	Starting & Broiler	10.5	19.1	18.0	3.8	2.5	53.4	5.3	7.0	7.9
1	Turkey Grower	10.0	21.2	20.0	3.6	2.0	49.7	7.1	7.5	8.4
Elmore Milling Co., Inc.										
1	Chixsaver	12.8	17.3	20.0	3.8	4.0	52.8	6.5	7.0	6.8
2	Egg Mash	10.1	20.6	20.0	4.4	3.0	46.8	8.1	10.0	10.0
2	Horse Feed with Molasses	13.9	10.8	9.0	3.0	2.5	62.4	6.9	11.0	3.0
1	Milk Grains "Twenty"	11.6	20.0	20.0	4.4	4.0	46.4	9.0	10.0	8.6
1	Milk Grains Sixteen	13.3	15.9	16.0	4.2	4.0	51.8	9.3	10.0	5.5
2	Test Ration	12.1	19.1	18.0	4.8	4.0	48.3	9.3	10.0	6.4
1	Turkey Breeder Mash	10.1	20.1	20.0	4.6	4.0	49.7	7.7	8.0	7.8
1	Turkey Finisher (Fattener)	9.9	20.4	17.0	5.0	4.0	47.7	7.8	8.0	9.2
1	Turkey Growing Mash	9.9	21.8	20.0	4.6	4.0	48.1	7.2	8.0	8.4
1	Granger 20% Dairy Ration	10.0	22.2	20.0	5.1	3.5	43.3	12.5	11.0	6.9
John W. Eshelman & Sons										
1	Pennsy 16 Dairy Feed	12.0	16.0	16.0	4.7	3.0	51.2	9.6	11.0	6.5
1	Red Rose Calf Starter	10.8	21.0	22.0	4.6	4.0	51.5	4.3	5.0	7.8
1	Red Rose Chick Grains	12.0	10.2	10.0	2.1	2.5	70.6	2.7	3.0	2.4
1	Red Rose 18% Dairy Feed	11.2	17.9	18.0	4.2	4.0	53.6	8.1	9.0	5.0
1	Red Rose 16 Dairy Feed	11.6	17.1	16.0	4.4	4.0	54.2	7.9	11.0	4.8
1	Red Rose Fitting	12.9	12.0	12.0	3.2	4.0	60.5	6.6	7.0	4.8
1	Red Rose 85 Horse Feed	12.5	10.8	9.0	3.8	3.5	58.9	10.1	10.0	3.9
1	Red Rose Laying Mash	9.6	18.7	20.0	4.1	3.0	51.6	8.3	7.5	7.7
1	Red Rose Pig & Hog Meal	10.5	17.5	18.0	3.3	3.5	52.4	8.5	10.0	7.8
1	Red Rose Starter & Grower	10.4	16.5	16.0	3.6	3.5	56.6	6.5	7.0	6.4
1	Red Rose Turkey Grower	11.0	20.6	20.0	3.2	3.5	51.7	6.2	8.0	7.3
Essex County Co-Operative Farming Assn.										
2	S-X All-Mash Breeder	12.5	16.1	15.0	4.6	4.0	54.9	5.2	6.0	6.7
2	S-X All-Mash Egg	12.5	15.7	15.0	4.2	4.0	55.9	5.3	6.0	6.4
2	S-X Breeder Mash	11.9	20.9	20.0	4.9	4.0	49.3	5.7	7.0	7.3
1	S-X Starter & Broiler	12.7	19.1	20.0	4.1	4.0	52.4	5.1	6.5	6.6
1	S-X 20% Dairy	13.5	18.8	20.0	3.4	3.5	51.1	7.4	8.5	5.8
1	S-X 16% Dairy	12.5	17.8	16.0	4.3	3.0	54.6	6.3	10.0	4.5
2	S-X Egg Mash	12.9	20.3	20.0	4.2	4.0	48.1	5.8	7.0	8.7
1	S-X 14% Fitting	12.3	16.2	14.0	3.8	3.5	55.2	7.6	8.5	4.9

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num-ber of Analy-ses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
	Farm Bureau Association									
2	Complete Developer	11.2	19.5	15.0	4.9	3.0	50.1	6.8	7.5	7.5
1	Conditioner	16.0	16.0	18.0	3.5	4.5	54.8	5.7	6.5	7.9
1	Dairy 20% ^g	10.4	21.3	20.0	5.1	3.5	47.1	9.6	9.0	6.2
1	Dairy 18% ^g	11.4	22.0	18.0	4.6	4.0	47.9	8.4	9.0	5.7
2	16% Dairy Ration	11.6	20.2	16.0	4.9	4.0	48.5	9.2	9.0	8.0
1	Developer	10.2	17.5	19.0	3.4	3.5	48.0	12.9	8.0	5.8
1	Fitting Ration	11.5	17.4	14.0	4.7	4.0	52.1	8.5	9.0	5.1
1	Flushing Mash	11.4	17.7	12.5	5.0	3.0	58.1	2.7	5.0	3.7
1	Horse Feed	13.8	17.8	11.0	3.9	3.5	58.3	7.5	8.0	7.8
2	Market Egg Mash	8.7	24.6	20.0	6.0	6.0	44.7	8.2	7.0	8.7
2	Turkey Grower and Finisher	10.9	21.5	20.0	4.0	3.5	48.4	6.5	8.0	8.7
	E. H. Felton & Co.									
1	Blue Belt Egg Mash.	16.0	18.7	18.0	2.6	3.5	48.9	5.4	7.0	8.4
	Flambeau Milling Co.									
1	Big Elk Broiler Mash	10.3	19.9	18.0	4.6	4.0	49.6	8.3	7.0	7.3
1	Big Elk Chick Starter	10.8	19.2	18.0	4.1	4.5	50.3	7.4	7.0	8.2
1	Big Elk Laying and Breeder Mash	10.8	20.1	20.0	5.0	4.0	48.5	8.4	7.0	7.2
1	Big Elk Starter & Growing Mash	11.2	17.8	18.0	4.4	4.0	52.6	7.3	6.5	6.7
	Flory Milling Co., Inc.									
1	Floco (National) 20% Dairy Feed	11.4	16.9	20.0	3.8	3.5	48.8	11.9	11.0	7.2
1	Floco (National) 16% Dairy Feed	12.0	16.1	16.0	4.5	3.5	47.5	10.4	11.0	9.5
1	Floco All-Mash Laying Ration	11.0	17.2	15.5	3.7	4.0	53.2	6.2	7.0	8.7
1	Flory 20% Dairy Feed	11.7	16.7	20.0	4.2	4.0	52.0	7.4	10.0	7.3
2	Flory 16% Dairy Feed	12.4	16.7	16.0	3.7	3.0	50.6	8.1	10.0	8.5
1	Flory Fatener and Flesher	11.0	15.6	14.0	3.3	5.0	56.8	5.5	7.0	7.9
1	Flory Free Range Growing Mash	12.3	17.2	16.0	3.3	3.0	52.3	6.4	7.5	9.5
1	Flory 18% Growing Mash	10.0	17.0	18.0	3.2	4.0	55.5	6.1	7.5	8.2
1	Flory Hog Feed	11.9	15.3	16.0	3.5	3.5	52.1	7.7	7.5	9.5
2	Flory 85% ^g Horse Feed	12.9	10.2	9.0	3.5	2.5	58.7	8.0	10.0	7.2
1	Flory Laying Mash	10.4	17.4	19.0	3.9	4.0	53.8	5.8	7.5	9.6
1	Flory Laying Mash	12.4	16.5	18.0	4.1	4.0	52.3	5.1	7.5	9.6
1	Flory Turkey Grower	10.0	21.5	20.0	3.7	3.0	50.1	5.5	7.5	8.9
1	Flory Turkey Grower	12.0	18.0	18.0	3.7	3.0	51.3	6.1	7.5	8.9

Complete Average Analyses of Commercial Feeds Collected (Per Cent)--Continued

Num-ber of Anal-yses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Glidden Co., Feed Mill Division										
3	Capitol 16 $\frac{1}{2}$ % Dairy Feed	12.1	19.2	16.5	4.3	1.5	46.4	8.9	15.0	9.1
5	Glidden Broiler Ration	10.3	21.9	20.0	4.1	3.0	49.3	6.1	7.0	8.3
1	Glidden 16% Dairy Feed	12.7	19.7	16.0	3.3	3.0	50.7	6.6	8.0	7.0
6	Glidden Growing Mash	11.0	18.1	17.0	4.0	3.0	54.4	5.5	7.0	7.0
5	Glidden Laying Mash	10.3	21.2	20.0	3.8	3.0	49.6	5.5	8.0	9.6
3	Glidden 18% Pig Meal	11.6	19.5	18.0	3.7	3.0	53.9	4.6	7.0	6.7
2	Glidden Turkey Grower	10.6	23.6	22.0	3.7	2.5	48.2	5.2	7.0	8.7
D. H. Grandin Milling Co.										
1	All-Mash Layer	9.8	15.7	15.0	4.4	3.0	53.8	7.8	8.0	8.5
1	Horse Feed	13.3	11.4	9.5	3.0	3.5	58.8	7.4	11.0	5.2
2	Laying Mash	9.8	21.3	20.0	4.6	3.0	46.3	7.8	8.0	10.2
2	16 Milk Maker	11.5	18.1	16.0	5.5	3.5	50.2	8.3	10.0	6.4
3	Start-to-Finish Mash	9.6	19.0	18.0	4.4	3.0	49.8	7.9	8.0	9.3
2	Starter & Broiler Mash	10.2	17.6	18.0	4.0	3.0	51.4	7.2	8.0	9.6
1	Stock Feed	10.6	10.7	9.0	4.8	4.0	58.6	8.5	12.0	6.8
1	Test Ration	13.4	17.0	16.0	5.2	3.5	50.3	8.1	10.0	6.0
1	Turkey Grower	11.2	20.8	20.0	3.4	3.0	47.5	7.9	8.0	9.2
1	Turkey Starter	10.8	25.7	24.0	4.1	3.0	43.1	6.8	8.0	9.5
Great Atlantic & Pacific Tea Co.										
1	Daily-Egg Laying Mash	10.6	20.5	20.0	3.9	3.0	51.2	4.1	7.5	9.7
1	Daily-Growth Growing Mash	10.4	17.9	17.5	4.1	3.0	55.1	4.5	7.5	8.0
Hales & Hunter Co.										
2	Red Comb Chick Starter	11.4	22.3	20.0	3.4	3.0	49.2	5.8	6.0	7.9
2	Red Comb Egg Mash	11.0	21.4	20.0	3.8	3.0	48.9	6.4	7.0	8.5
D. Harbeck & Sons										
2	Crusader All Purpose Mash	12.1	16.7	18.0	4.2	3.5	53.3	5.0	7.0	8.7
2	Welcome Dairy Feed	10.3	19.5	20.0	4.6	4.0	50.3	8.6	10.0	6.7
2	Welcome Egg Mash	12.2	16.9	20.0	4.1	4.0	54.4	4.4	7.0	8.0
2	Welcome Growing Mash	11.8	15.3	18.0	4.1	4.0	56.4	4.6	7.0	7.8
2	Welcome Starter and Broiler Mash	12.2	16.5	18.0	4.0	4.0	55.3	4.5	7.0	7.5
Harper Feed Mills, Inc.										
1	Harco 18% Broiler Mash	12.3	17.9	18.0	3.3	3.0	53.3	6.2	7.0	7.0
1	Harco Growing Mash	11.9	20.2	18.0	3.9	3.0	49.5	6.6	8.0	7.9

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Num-ber of Anal-yses	Manufacturer and Brand	Water	Protein		Fat		Nitro-gen Free Ex-tract	Fiber		Ash
			Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
1	F. R. Miller Feed Mills 18% Broiler Ration	11.2	18.4	18.0	3.6	5.0	55.9	5.0	5.5	5.9
3	Geo. Q. Moon & Co., Inc. Complete Growing Mash	11.4	16.6	16.0	3.5	3.0	52.7	7.3	7.0	8.5
4	Complete Laying Mash	11.5	17.8	17.0	3.5	3.0	51.7	7.1	7.0	8.4
2	Complete Starter & Broiler	11.6	16.7	18.5	3.5	3.5	53.2	6.7	6.0	8.3
1	Duxiat Pellets	12.4	14.0	13.0	3.0	4.0	60.1	5.4	6.0	5.1
2	Fitting Ration	12.7	14.6	13.0	3.8	3.0	54.1	7.4	9.0	7.4
3	Hog Feed	11.9	15.3	13.0	3.7	3.0	53.6	8.5	8.0	7.0
1	90 Horse Feed	13.3	14.1	9.0	3.6	3.0	57.4	7.8	10.0	3.8
1	Special A Dairy 20% Feed	11.8	20.0	20.0	5.1	3.0	45.4	9.6	10.0	8.1
4	Special A Dairy 16% Ration	12.1	16.5	16.0	3.6	3.0	53.5	7.9	10.0	7.4
1	Stock Feed	10.7	12.4	9.0	2.9	3.0	55.6	11.3	12.0	7.1
2	Test Ration	11.9	17.2	16.0	3.3	4.0	53.8	7.4	8.0	6.4
1	New Bedford Grain Co. Special Growing	11.0	18.8	17.5	4.3	3.0	51.0	5.7	7.0	9.2
1	New England Grain Co. Starter & Broiler	11.4	16.5	15.0	4.0	5.0	55.5	6.8	6.0	5.8
1	Sterling 16% Dairy Feed	10.4	20.0	16.0	4.9	3.5	46.9	12.1	11.0	5.7
3	Sterling Laying Mash	11.5	17.8	18.0	4.4	4.0	52.1	6.2	8.0	8.0
3	Sterling Starter and Growing Feed	11.4	17.5	17.0	4.4	4.0	51.8	6.4	8.0	8.5
1	16% Test Ration	12.8	15.2	16.0	4.7	4.0	52.8	10.1	9.0	4.4
1	North Dakota Mill & Elevator Dakota Maid All Mash Chick Starter & Grower	12.3	14.6	16.0	4.9	4.0	57.0	6.0	7.0	5.2
1	Dakota All Mash Laying Ration	12.1	14.8	16.0	5.2	3.0	55.4	6.6	8.0	5.9
1	Northwest Distributing Co. Nodco 16% Dairy Ration	12.9	14.4	16.0	3.7	3.0	48.7	11.1	12.0	9.2
2	Northwest's 18% Broiler	9.8	19.1	18.0	4.6	4.0	49.1	8.6	8.0	8.8
1	Ogden Grain Co. "Biddy" Laying Mash	11.0	18.7	20.0	5.0	4.0	49.7	8.2	7.0	7.4
1	Cloverbloom 20% Dairy Feed	10.4	17.4	20.0	4.8	3.5	51.1	9.7	12.0	6.6

2	Pilgrim Fitting Ration	12.4	14.1	14.0	3.7	4.0	55.5	3	7.0	6.0
1	Pilgrim Layer & Breeder	11.4	18.8	20.0	5.1	4.0	49.6	7.8	7.0	7.3
2	Pilgrim Starter-Grower-Layer	10.9	17.2	18.0	5.0	4.0	50.2	9.2	8.0	7.5
1	Pilgrim Turkey Grower	11.3	21.8	20.0	5.2	4.0	46.3	7.0	5.0	8.4
Park & Pollard Co.										
1	Bulky Sweet Dairy Feed	12.3	15.5	12.0	3.3	2.5	50.1	12.6	12.0	6.2
1	Doublex 18% Dairy Ration	11.1	20.2	18.0	3.7	3.5	48.5	10.9	12.0	5.6
3	Lay or Bust Dry Mash	11.7	18.8	18.0	3.8	3.0	51.5	6.2	7.0	8.0
1	Milkade Calf Starter Pellets	14.4	24.0	22.0	3.0	4.0	46.4	5.2	5.0	7.0
3	Milk-Maid 18% Dairy Ration	12.4	17.8	18.0	3.0	3.5	53.2	7.4	10.0	5.4
1	Milk-Maid 16% Dairy Ration	11.2	16.5	16.0	3.9	3.5	53.9	8.6	10.0	5.9
1	Milk-Maid Test Cow Ration	10.7	18.0	16.0	3.0	4.0	55.5	6.5	9.0	5.8
2	Park & Pollard All-Mash Growing Feed	12.0	15.1	14.5	3.2	3.0	55.8	6.2	7.0	7.7
1	Park & Pollard All-Mash Laying Ration	11.2	18.9	16.0	3.2	3.0	54.7	5.3	7.0	6.7
1	Park & Pollard All-Mash Laying Ration	12.9	15.2	15.0	3.2	2.5	54.4	6.3	7.0	8.0
1	Park & Pollard Breeder Mash	10.1	18.9	20.0	4.4	3.0	49.5	6.2	7.0	10.9
2	Park & Pollard Breeder Mash	11.4	18.8	18.0	4.1	3.0	49.6	6.2	7.0	9.9
1	Park & Pollard Broiler Mash	11.1	16.8	16.0	3.2	3.0	55.8	5.1	7.0	8.0
1	Park & Pollard Chick Scratch	14.0	11.0	10.0	2.7	2.0	67.8	1.8	3.5	2.7
1	Park & Pollard Chick Starter	11.9	19.2	18.0	4.0	3.0	51.1	5.7	7.0	8.1
4	Park & Pollard Fitting Ration	13.5	13.7	12.0	4.2	3.0	56.5	7.5	9.0	4.6
1	Park & Pollard Fleshing Pellets	11.3	15.5	14.0	3.6	3.0	53.8	7.3	7.0	8.4
2	Park & Pollard Growing Pellets	10.5	17.4	16.0	3.9	3.0	53.3	5.8	7.0	9.1
2	Park & Pollard Growing Pellets	11.4	16.4	16.0	3.1	3.0	53.0	7.4	7.0	8.7
1	Park & Pollard Laying Pellets	9.1	22.0	20.0	4.7	3.0	44.9	7.8	7.0	11.5
1	Park & Pollard Turkey Grower Pellets	12.8	22.5	20.0	4.7	3.0	59.4	7.5	9.0	4.2
George H. Parker Grain Co.										
2	Egg Mash	11.2	17.4	18.0	4.2	5.0	52.8	5.7	7.0	8.7
1	Growing Mash	12.3	17.8	17.0	4.5	4.5	50.8	6.1	6.0	8.5
1	Starter and Broiler Mash	12.9	18.5	17.5	4.6	4.0	50.9	5.7	7.0	8.3
Pierce Grain Corp.										
1	Reliance Starting & Growing Feed	10.8	19.1	17.0	6.3	4.0	50.4	8.3	6.0	5.1
Quaker Oats Co.										
1	Full-O-Pep Calf Starter	9.9	19.1	20.0	5.8	4.5	52.6	5.9	8.0	6.7
2	Full-O-Pep Egg Breeder Mash	9.9	19.2	20.0	4.8	4.0	51.2	7.7	8.0	7.2
1	Full-O-Pep Chick Starter	10.6	17.1	17.0	4.6	4.0	55.3	5.7	8.0	6.7
2	Full-O-Pep Horse Feed	11.0	11.0	12.0	4.5	3.0	57.9	9.0	10.0	5.6
3	Full-O-Pep Laying Mash	10.4	20.2	20.0	4.2	3.5	51.0	6.9	8.0	7.3
4	Quaker Sugared Schumacher Feed	10.0	11.0	10.0	2.9	3.0	61.8	9.6	12.0	4.7

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Number of Analyses	Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
			Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
Ralston Purina Co.										
2	B & M Cow Chow	11.7	17.3	16.0	4.4	3.5	52.0	7.9	10.0	6.7
2	Broiler Chow	11.8	18.8	18.0	4.4	3.5	52.7	5.9	7.0	6.4
3	Call Startena	12.1	22.1	19.5	3.3	2.5	48.5	7.6	9.5	6.4
1	Chick Growena	11.9	18.6	17.0	3.7	3.0	52.8	6.0	7.0	7.0
1	Chick Growing Chow	10.4	24.9	23.0	4.6	3.5	43.2	6.6	7.0	10.3
2	Chick Startena	12.0	19.1	18.0	4.5	3.5	53.6	3.6	7.0	7.2
2	Dry and Freshening Chow	13.4	13.6	12.5	3.9	2.0	51.6	8.7	14.0	8.8
1	Eastern Cow Chow	11.4	21.9	20.0	4.2	3.0	45.3	9.1	12.0	8.1
1	Hog Fatena	13.3	15.6	14.0	3.4	3.0	56.9	5.9	7.0	5.0
3	Layena	12.4	15.5	15.5	3.5	3.0	53.8	5.5	8.0	9.2
1	Omolene	13.9	12.2	10.0	3.5	3.0	56.7	2.5	1.0	4.2
2	Turkey Fatena	12.1	15.7	14.0	3.3	3.5	58.1	5.4	7.0	5.4
3	Turkey Growena	10.8	20.6	18.0	4.3	3.5	49.9	6.2	7.0	8.2
1	Turkey Layena	13.3	17.9	16.5	3.6	3.5	51.4	5.7	8.0	8.1
1	Turkey Startena	11.3	25.3	24.0	4.6	4.0	45.7	4.7	7.0	8.4
Ryher & Warren Co.										
1	Blue Tag Dairy Ration	10.8	18.3	18.0	4.1	4.0	53.2	8.5	10.0	5.1
1	Minot Chick Mash	11.6	17.5	18.0	3.9	4.0	55.4	5.6	6.0	6.0
1	Minot Growing Mash	11.5	17.5	18.0	4.1	4.0	54.6	4.9	7.0	7.4
1	Minot Milk Egg Mash	11.5	16.7	17.0	3.8	4.0	55.6	5.9	8.0	6.5
Schuyler Milling Co.										
1	Farm Service 18% Broiler Ration	10.8	15.9	18.0	3.2	5.0	54.4	3.9	8.0	11.8
1	Puritan Laying Mash	14.3	12.5	18.0	3.2	3.5	56.7	3.4	7.0	9.9
Sioux Soya Co.										
1	18% Egg Mash	13.2	16.7	18.0	3.6	4.0	52.8	5.6	7.0	8.1
3	18% Growing Mash	10.7	17.8	18.0	3.4	4.0	52.8	6.4	7.0	8.9
Staley Milling Co.										
1	Four Bells Growing Mash	10.2	19.1	17.0	3.2	3.0	54.9	5.5	7.0	7.1
Stratton & Co.										
4	"24" Stock Feed	11.4	7.5	7.5	2.5	2.8	61.5	13.7	14.4	3.4

1	Tioga Mills, Inc. Ti-O-Ga Calf Food	11.5	25.1	24.0	3.0	3.0	48.6	3.5	5.0	8.3
1	Jacob Trinley & Sons, Inc. Supreme 85% Horse Feed	12.7	9.6	9.0	4.7	2.5	59.7	9.5	11.0	3.8
1	United Cooperative Farmers, Inc. United Farmers Breeder Mash	10.9	21.9	19.0	4.7	3.0	45.2	7.2	8.0	10.1
1	United Farmers Fitting Ration	10.4	15.7	12.0	4.2	3.0	56.6	7.1	9.0	6.0
1	United Farmers Grower	10.9	18.4	17.0	4.0	3.0	53.2	6.3	8.0	7.2
1	United Farmers Layer	11.2	18.2	18.0	3.8	3.0	54.2	5.8	8.0	6.8
1	United Farmers Milkmaid	10.0	20.9	18.0	4.5	4.5	49.8	7.9	8.0	6.7
1	United Farmers Starter	10.6	20.1	19.0	5.1	3.0	50.9	6.4	7.0	6.9
1	Unity Feeds, Inc. Life Saver 16% Dairy Ration	11.5	15.0	16.0	4.3	3.0	55.0	7.4	10.0	6.8
3	Paycheck 20% Dairy Ration	9.6	22.6	20.0	5.2	4.0	46.0	8.8	11.0	7.8
2	Unity Complete Broiler Mash	11.6	15.5	18.0	4.0	3.5	54.5	6.8	7.0	7.6
2	Unity Growing Mash	11.3	16.7	16.0	4.0	3.0	54.1	5.8	7.0	7.3
2	Unity Laying Mash	11.3	15.4	18.0	4.4	3.0	53.8	7.3	7.0	7.8
1	Unity Market Egg Mash	11.4	19.1	20.0	3.9	3.0	51.2	5.2	8.0	8.9
2	Unity Pig & Hog Ration	11.2	20.0	17.0	4.1	4.0	49.8	6.7	8.0	8.2
3	Unity Tri-Way Mash	11.1	17.2	18.0	4.4	3.0	54.0	6.3	7.0	7.0
1	Unity Turkey Starting and Growing Mash	10.8	16.1	22.0	4.8	4.0	54.0	7.8	7.0	6.5
2	Arthur Ventura Grain Co. Every-Day Dairy	10.2	20.1	22.0	4.1	4.5	48.5	9.9	7.0	7.2
1	Grower	10.4	19.8	16.0	4.4	4.0	50.5	6.7	6.0	8.2
1	Laying Mash	10.6	19.5	19.0	4.4	5.0	49.8	7.0	7.0	8.7
1	Starter	10.5	19.6	19.0	4.9	5.0	48.4	7.7	6.0	8.9
2	Vita-Vim Millers Speedy Egg Mash	11.9	18.9	20.0	4.7	3.5	49.3	6.6	8.9	8.6
2	Speedy Grower	11.5	19.1	18.0	4.5	3.0	50.5	6.0	8.8	8.4
2	Vita-Vim All Mash Breeder Mash	11.5	18.1	15.2	4.8	4.0	52.0	6.0	8.0	7.6
3	Vita-Vim All Mash Growing Mash	11.4	17.1	15.0	4.1	4.0	54.2	5.2	8.7	8.0
1	Vita-Vim All Mash Laying Mash	12.0	16.8	15.2	4.0	4.0	53.9	6.0	8.6	7.1
1	Vita-Vim Breeder 90	11.4	23.2	20.0	4.6	4.0	44.9	4.9	8.7	10.7
2	Vita-Vim Broiler Mash	11.3	19.9	18.0	4.6	4.0	50.0	5.2	7.8	9.0
1	Vita-Vim Calf Meal	11.4	19.4	16.0	3.3	4.0	54.1	5.0	6.2	6.9
1	Vita-Vim Cream-O-Fat 20% Dairy Ration	11.4	20.7	20.0	3.5	4.0	49.3	8.8	9.5	6.3
2	Vita-Vim Cream-O-Fat 18% Dairy Ration	11.8	17.5	18.0	4.3	4.0	50.6	9.2	9.5	6.6
2	Vita-Vim Cream-O-Fat 12% Fitting Ration	12.5	13.6	12.0	3.4	4.0	56.6	7.8	9.5	6.1
1	Vita-Vim Original Egg Control Laying Mash	11.6	19.1	20.0	5.0	4.0	48.9	5.6	8.7	9.8
1	Vita-Vim Original Starling and Growing Mash	11.4	20.9	20.0	5.6	3.5	46.7	6.4	7.0	9.0
1	Vita-Vim Pep-O-Flush Mash	11.6	18.3	15.0	4.0	3.5	52.4	6.3	8.0	7.4
1	Vita-Vim Pig & Hog Ration	11.6	15.9	15.0	3.3	3.0	62.7	4.5	8.5	2.3
1	Vita-Vim Pullet Control Mash	11.3	18.9	18.0	4.7	4.0	51.5	6.3	8.7	7.3
1	Vita-Vim Turkey Growing Mash	11.4	22.1	23.0	4.1	3.7	47.6	5.9	8.7	8.5
2	Vita-Vim V-10 (Original) Mash	11.3	22.2	20.0	4.1	3.7	48.5	5.3	8.7	8.6

Complete Average Analyses of Commercial Feeds Collected (Per Cent)—Continued

Number of Analyses	Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
			Found	Guaranteed	Found	Guaranteed		Found	Guaranteed	
1	O. B. Vunck & Co.									
1	Cortland Dairy Ration	11.6	19.8	20.0	4.4	3.5	47.1	10.1	12.0	7.0
	Cortland Growing Mash	11.2	18.7	16.0	4.6	4.0	49.8	7.1	6.5	8.6
3	Wapsie Valley Feed Co.									
	18% Egg Mash	10.6	18.3	18.0	3.9	4.0	52.6	6.0	7.0	8.6
1	C. P. Washburn Co.									
2	Made-Right Breeder Mash	13.8	15.0	18.0	3.4	3.5	56.5	5.5	7.0	5.8
1	Made-Right Complete Broiler Ration	12.2	15.7	18.0	4.2	3.5	57.2	5.0	7.0	5.7
1	Made-Right Laying Mash	11.6	16.3	20.0	3.8	3.5	56.0	5.6	7.0	6.7
1	Made-Right Laying Mash	13.6	14.2	18.0	3.5	3.5	56.8	5.0	7.0	6.9
1	Made-Right Starting & Growing Feed	11.3	17.7	20.0	4.4	3.0	53.1	5.9	7.0	7.6
1	Wayne County Grangers Feed Corp.									
	Superior Fitting Ration	13.5	15.0	14.0	4.3	3.5	50.6	10.3	9.0	6.3
3	H. K. Webster Co.									
3	Blue Seal All Mash Breeder's Ration	11.7	15.1	15.0	3.7	3.5	57.9	5.3	5.5	6.3
1	Blue Seal All-Mash Egg Ration	12.7	13.7	15.0	3.4	3.5	58.1	6.1	5.5	6.0
2	Blue Seal All-Mash Growing Ration	11.3	14.2	14.5	4.1	3.5	58.5	5.4	6.0	6.5
4	Blue Seal Calf Grower	10.4	17.6	20.0	4.7	3.5	50.9	7.0	7.0	11.2
2	Blue Seal Calf Starter	12.4	13.4	12.0	3.5	3.0	55.9	8.2	8.2	6.6
1	Blue Seal Chick Feed	13.7	18.8	18.0	3.9	4.0	54.2	5.0	5.0	6.4
4	Blue Seal Chick Starter	11.7	10.5	10.0	2.4	2.5	69.7	1.9	4.0	1.8
1	Blue Seal "20" Dairy Ration	10.6	19.3	19.0	4.7	3.5	50.6	5.7	6.5	8.0
3	Blue Seal "16" Dairy Ration	11.7	18.8	20.0	5.0	4.0	52.2	7.2	9.0	6.2
4	Blue Seal Egg Mash	11.5	15.9	16.0	4.3	4.0	54.9	7.5	9.0	5.7
1	Blue Seal Fattening Pellets	11.2	17.0	18.0	3.9	3.5	52.6	6.1	6.5	9.3
3	Blue Seal Fitting Ration	11.4	15.6	14.0	3.9	3.5	57.2	6.3	6.5	5.7
5	Blue Seal Growing Mash	11.4	14.4	13.0	4.6	4.0	56.0	8.1	9.0	5.7
2	Blue Seal Horse Feed	12.8	17.4	18.0	3.7	3.5	51.9	7.0	7.0	9.3
1	Blue Seal Pig Feed	12.1	14.8	10.0	3.9	3.0	58.0	7.5	9.0	5.8
1	Blue Seal Rabbit Pellets	12.4	15.3	14.0	4.0	4.0	56.0	7.4	6.0	4.9
1	Blue Seal Richford 20 Dairy Ration	10.7	19.7	20.0	4.9	4.0	49.6	7.9	10.0	7.2
3	Blue Seal Richford 16 Dairy Ration	11.5	15.1	16.0	4.1	4.0	55.6	8.2	10.0	5.5

3	Blue Seal Stock Feed	11.7	11.7	8.5	3.5	3.0	59.1	8.1	17.0	5.9
2	Blue Seal Succulent Feed	11.8	11.4	10.0	3.5	1.5	55.2	11.3	18.0	6.8
2	Blue Seal Tonic Mash	12.1	13.4	15.0	4.6	3.5	57.2	6.0	6.0	6.7
1	Blue Seal Turkey Starter	10.4	26.7	24.0	4.2	4.0	41.8	6.4	7.0	10.5
1	Blue Seal Turkey Growing	10.8	19.0	20.0	4.2	3.5	50.1	6.2	7.0	9.7
2	Welco Feed Manufacturing Co.									
	Growing Mash	11.1	18.2	18.0	3.2	4.0	52.3	5.6	6.5	9.6
	West-Nesbitt, Inc.									
1	All Pure Milk Ration	11.8	19.5	20.0	4.3	3.5	48.5	8.8	10.0	7.1
2	Pure Feed Dairy Ration	11.5	18.5	20.0	3.8	4.0	51.9	7.2	10.0	7.1
1	Pure Feed Egg Maker	10.6	17.2	18.0	4.0	3.5	53.5	6.6	8.0	8.1
	Est. M. G. Williams									
2	Balanced Ration	11.4	19.3	18.0	4.1	4.0	49.4	6.5	10.0	9.3
2	Chick-Starter	11.0	19.7	20.0	4.3	4.0	49.0	5.8	7.0	10.2
2	Growing Mash	10.8	18.5	18.0	4.3	4.0	51.3	6.1	7.0	9.0
1	Laying Mash	11.0	18.1	18.0	4.1	4.0	50.2	5.7	7.0	10.9
	Stanley Wood Grain Co.									
2	Bliss Dairy Ration	10.9	19.8	18.0	4.6	4.0	51.4	6.9	10.0	6.4
1	Preferred Complete Growing Feed	11.2	16.8	15.0	3.8	4.0	50.7	6.3	5.0	5.2
1	Preferred Complete Laying Ration	11.3	16.1	15.0	3.8	4.0	50.1	6.2	5.0	6.5
1	Preferred Growing Feed	11.4	17.6	17.5	4.0	4.5	53.4	6.9	6.0	6.7
1	Preferred Laying Mash	11.8	18.6	18.0	4.7	4.0	49.8	6.8	7.0	8.3
2	Preferred Starting Feed	12.2	19.6	18.5	4.5	4.0	48.1	6.0	5.0	9.6
2	Wood's Dairy Ration	11.0	18.8	20.0	4.3	4.0	53.0	7.7	10.0	5.2
	Yaggle Mills									
1	18% Growing Mash	10.8	18.2	18.0	3.8	4.0	53.7	5.3	7.0	8.2

Alfalfa Meals

Alfalfa meal samples analyzed conformed more closely to guarantees than has been noted in the past. Any improvement in carotene content was not marked. It is to be regretted that, do what the processor will to improve his product in this respect, subsequent unsatisfactory handling will cause a rapid loss of carotene. For this there can be no remedy except that which can be attained through the exercise of greater care in holding the material under proper temperature and moisture conditions or the avoidance of holding it over a long period of time.

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash	Carotene Milligrams per Pound
		Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed		
Buckeye Sugar Co.										
Ottawa Dehydrated Alfalfa Meal	6.4	17.0	17	2.9	1.3	41.6	24.2	28	7.9	46
A. B. Caple Co.										
Capex 15% Dehydrated Alfalfa Meal	8.3	16.9	15	2.3	1.5	34.1	28.5	31	9.9	26
Capex 15% Dehydrated Alfalfa Meal	5.5	16.7	15	3.2	1.5	41.2	24.3	31	9.1	39
Caro-Green Laboratories										
Dehydrated Alfalfa Meal	7.3	19.2	17	2.7	1.5	35.3	25.8	28	9.7	32
Central Alfalfa										
Suncured Alfalfa Meal	12.2	15.0	17	1.6	1.5	35.2	26.6	28	9.4	12
Suncured Alfalfa Meal	13.0	16.4	17	1.7	1.6	35.4	24.1	28	9.4	14
Denver Alfalfa Milling and Products Co.										
Jack Rabbit 17% Dehydrated Alfalfa Meal	4.2	18.0	17	2.6	1.5	37.9	27.9	27	9.4	39
Jack Rabbit 17% Dehydrated Alfalfa Meal	6.7	15.4	17	2.1	1.5	32.6	34.0	27	9.2	15
Jack Rabbit 17% Dehydrated Alfalfa Meal	6.7	16.6	17	2.2	1.5	34.6	30.4	27	9.5	17
Farm Industries, Inc.										
Alfalfa Meal 17	4.5	17.7	17	2.4	1.5	40.6	26.2	30	8.6	50
Alfalfa Meal 17	5.1	17.5	17	2.6	1.5	41.4	22.0	30	11.4	45
Alfalfa Meal 15	10.2	15.4	15	1.8	1.5	37.2	27.8	32	7.6	6
Glendale Alfalfa Mills										
15% Alfalfa Meal	6.9	16.3	15	1.8	1.5	36.9	28.2	36	9.9	14

Keystone Dehydrators												
Super Green Dehydrated Alfalfa Meal	8.5	19.7	17	2.4	2.0	36.0	22.3	30	11.1	27	31	7
Super Green Dehydrated Alfalfa Meal	4.5	18.2	17	2.1	2.0	36.6	28.6	30	10.0	30	31	7
Super Green Dehydrated Alfalfa Meal	6.7	15.9	17	2.5	2.0	38.7	28.5	30	7.7	30	31	9
Meadow Brook Farms												
Superior Brand Dehydrated Alfalfa Meal	4.7	15.8	15	2.5	2.0	37.3	30.2	30	9.5	30	44	44
Mississippi Valley Dehydrating Assn., Inc.												
Alfalfa Meal 17	4.0	14.7	17	2.6	1.5	41.2	27.6	30	9.9	30	27	27
Nebraska Farm Products												
Emerald 17% Dehydrated Alfalfa Meal	7.9	17.9	17	2.1	1.5	32.5	29.3	28	10.3	28	28	28
Pacific Milling Co.												
Poultry Alfalfa Meal	7.5	18.1	16	2.0	2.0	37.0	24.2	30	11.2	30	19	19
Pecos Valley Alfalfa Mill Co.												
Velvet Brand Alfalfa Meal	6.6	16.6	17	1.9	1.5	37.4	27.2	27	10.3	27	14	14
Poppe Alfalfa Co.												
Superb Alfalfa Meal	10.0	19.4	20	2.0	2.0	36.2	22.6	18	9.8	18	20	20
Robinson Farms												
Alfalfa Leaf Meal	10.0	23.1	20	1.7	1.5	37.1	15.6	18	12.5	18	7	7
Alfalfa Leaf Meal	11.3	22.6	20	1.7	1.5	38.2	15.2	18	11.0	18	7	7
Schoenck Farms, Inc.												
Super-Green Dehydrated Alfalfa Meal	4.8	19.1	17	3.3	2.0	37.6	24.4	25	10.8	25	46	46
Super-Green Dehydrated Alfalfa Meal	6.7	20.1	17	2.4	2.0	36.3	24.7	25	9.8	25	22	22
Super-Green Dehydrated Alfalfa Meal	5.5	15.7	17	2.9	2.0	39.4	26.5	27	10.0	27	48	48
Super-Green Dehydrated Alfalfa Meal	7.0	18.7	17	2.4	2.0	34.4	28.3	25	9.2	25	41	41
Sence Alfalfa Milling Co.												
Alfalfa Meal	8.8	15.7	17	1.8	2.0	36.0	27.2	25	10.5	25	21	21

Riboflavin Supplements

For much of the material other vitamins and food values are present and claimed. Assays have been confined to those where chemical methods are available without the use of laboratory animals or chicks.

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash	Riboflavin Milligrams per Pound	Carotene Milligrams per Pound
		Found	Guaranteed	Found	Guaranteed		Found	Guaranteed			
Armour Creameries Dried Buttermilk	12.0	31.8	32	7.0	5	—	—	—	10.5	15	—
Atlantic Supply Co. Di-gra-sol	6.7	34.3	25	8.2	4	35.6	12.1	13	3.1	9	—
Commercial Solvents Corp. B-43 Riboflavin Supplement	4.5	15.7	15	5.2	5	63.5	6.3	6	4.8	114	—
Dawe's Manufacturing Co. Vitamelk Base, Poultry Type	10.6	34.7	34	1.6	3	45.0	2.3	6	5.8	28	—
Deerfield Creamery, Wisconsin Dried Skim Milk	5.9	35.1	32	1.5	1	49.5*	—	—	8.0	9	—
Getek Industrial & Agricultural Supplies Corp. Dried Distillers Solubles "M"	7.2	24.0	25	3.1	2	55.8	3.1	2.5	6.8	5	—
Dried Distillers Solubles "M"	8.3	23.0	25	5.0	2	49.8	5.5	2.5	8.4	6	—
Dried Distillers Solubles "M"	8.5	25.0	25	4.2	2	51.2	4.0	2.5	7.1	6	—
Dried Distillers Solubles "M"	9.6	30.4	25	1.5	2	48.4	3.3	2.5	6.8	8	—
Gorton-Pew Fisheries Co., Ltd. Al-Fish Blend	6.9	41.0	40	8.9	7	20.3	6.1	9	16.8	20	10
Hercules Powder Co., Dairy Products Division Dried Whey	6.2	12.6	11.5	1.3	0.2	70.7*	—	—	9.2	12	—
Kraft Foods Co. D-M-L Dried Whey-Product (Feeding)	7.2	13.7	13	1.3	2	63.2*	—	—	14.6	12	—
National Distillers Products Corp. Produlac Wheat Distillers Grains with Solubles	9.5	25.6	27	9.2	5	45.4	6.5	10.5	3.8	7	—
Produlac Wheat Distillers Grains with Solubles	7.9	28.4	27	5.6	5	45.4	8.4	10.5	4.3	7	—
Nadrisol Distillers Dried Solubles	6.3	34.8	25	1.0	1.5	52.4	2.1	4.0	3.4	7	—

Sherwood Feed Mills																			
Multi-Vita Brewers Yeast	9.2	45.1	45	2.3	-	36.1	0.2	-	7.1	18	-								
Valley Dehydration Plant																			
Bee-Gee Balanced B-G Complex Fish-Triate	9.2	42.6	40	5.9	3	17.4	11.2	13	13.7	23	11								
Bee-Gee Balanced B-G Complex Fish-Triate	7.4	42.9	40	5.5	3	20.1	11.5	13	12.6	26	18								
Western Condensing Co.																			
Peebles Lacto G Dried Whey	9.1	12.3	12	1.6	0.5	67.6*	-	-	9.4	9	-								
Peebles Lacto G Dried Whey	10.8	15.7	12	1.0	0.5	61.6*	-	-	10.9	11	-								
Peebles Fortified Whey Solids	10.1	14.7	12	0.6	0.5	64.5*	-	-	10.1	31	-								
Whitmoyer Laboratories, Inc.																			
Clo-Meal Vitamin Concentrate	7.5	39.8	38	10.5	5	25.7	3.0	6	13.5	78	-								
Clo-Meal Vitamin Concentrate	7.7	40.0	38	10.3	5	26.0	2.8	6	13.2	80	-								
Clo-Meal Vitamin Concentrate	5.9	44.9	38	7.2	5	27.2	3.0	6	11.8	80	-								
Gro-Tein (B Complex)	9.1	46.9	45	11.0	4	9.5	1.2	5.5	22.3	20	-								

*Lactose

Poultry Feeds with an Ash Content in Excess of 10 Per Cent

In addition to the regular analysis of such products, determinations of calcium, phosphorus, salt, and in some instances acid insoluble ash (silica) were made. In no case was salt found in excessive amount. A high acid insoluble ash content indicates the addition of mineral grit. One manufacturer states that this has been desired by certain feeders. The fact remains that the addition of such material to a feed materially reduces its cost. In most instances the high ash content was due to the addition of calcium and phosphorus salts. Whether or not the calcium-phosphorus ratio was disturbed to the extent that it did not conform to commonly accepted good feeding practice is debatable.

Manufacturer and Brand	Water		Protein		Fat		Nitrogen-Free Extract		Fiber		Ash	Calcium	Phosphorus	Salt	Acid Insoluble Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed					
Acme Milling Co. Golden Mash for Laying Hens	13.8	20.0	3.5	3.0	52.7	8.0	7.6	8.0	9.9	2.2	0.7	0.8	—	—	
Beacon Milling Co., Inc. Breeders Mash	22.3	22.0	4.9	3.5	43.7	7.5	6.1	7.5	12.0	2.5	1.2	0.9	2.8		
Turkey Growing Mash Pellets	10.3	20.0	4.9	3.5	43.5	7.5	6.6	7.5	13.0	3.0	1.3	1.1	2.7		
"22" Egg Mash	11.1	22.0	4.8	3.5	42.9	7.5	6.9	7.5	11.2	2.2	1.2	1.2	2.5		
Community Service, Inc. Laying Mash	21.6	18.0	4.0	4.0	46.7	6.5	5.5	6.5	10.5	1.7	1.0	1.1	—	—	
O. A. Cooper Co. Best 18% Egg Mash	18.3	18.0	3.3	3.3	46.2	8.0	7.9	8.0	12.9	2.8	1.0	1.2	0.5	—	
Courcy Grain Co. Eastern Laying Mash	17.5	17.0	4.1	4.0	49.5	6.0	5.9	6.0	11.5	3.4	1.1	0.9	1.3	—	
Curley Grain and Fuel Co. Crystal Complete Laying Mash	20.0	15.0	4.7	4.0	46.8	7.3	7.3	6.0	10.5	2.5	1.0	1.2	—	—	
Dailey Mills, Inc. Double Diamond Egg Producer	17.5	18.0	3.7	3.5	49.5	6.8	6.8	7.0	10.3	2.8	0.6	0.5	—	—	
Double Diamond Layer	18.3	20.0	4.9	3.5	47.8	8.3	8.3	7.0	10.5	2.7	0.7	0.5	—	—	
Eastern States Farmers' Exchange Egg Mash	19.8	20.0	3.7	2.5	47.7	8.0	6.6	8.0	12.1	2.5	1.4	1.1	0.6	—	
Elmore Milling Co., Inc. Egg Mash	16.9	20.0	4.5	3.5	52.7	8.0	5.7	8.0	10.0	2.3	1.0	1.2	—	—	
Flory Milling Co., Inc. 18% Growing Mash	17.0	18.0	3.1	4.0	50.6	7.5	6.2	7.5	11.4	2.2	0.8	1.4	—	—	

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FEEDINGSTUFFS FOR SALE
IN MASSACHUSETTS IN 1946**

- Ward G. Ackerman, Altamont, N. Y.
 Acme Milling Co., Olean, N. Y.
 Acme-Evans Co., Inc., Indianapolis, Ind.
 Albers Milling Co., Seattle 4, Wash.
 Allied Mills, Inc., Chicago, Ill.
 American Flours, Inc., Newton, Kan.
 American Maize-Products Co., 100 East 42nd St., New York 17, N. Y.
 Anchor Mills, Hagerstown, Md.
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.
 Archer-Daniels-Midland Co., Minneapolis 2, Minn.
 Armour & Co., U. S. Yards, Chicago, Ill.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
- E. W. Bailey & Co., Montpelier, Vt.
 Barber & Bennett, Inc., Albany, N. Y.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga N. Y.
 Best Foods, Inc., 237 Main St., Buffalo 3, N. Y.
 Black Brothers Flour Mills, Wymore, Neb.
 Blatchford Calf Meal Co., Waukegan, Ill.
 Blatchley & Ballard, Inc., Middletown, Conn.
 Bluepoints Co., Inc., Aberjona Packing Division, Woburn, Mass.
 Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
 Borden Grain Co., West Water St., Taunton, Mass.
 A. H. Brown & Bros., Boston, Mass. (Registered by Mellin's Food Co. of North America)
 Buckeye B. Brown Corp., Ipswich, Mass.
 Buckeye Cotton Oil Co., Cincinnati, Ohio
 Buckeye Feed Mills, Dalton, Ohio
- A. B. Caple Co., Toledo 5, Ohio
 Central Soya Co., Inc., Fort Wayne 2, Ind.
 Checkerboard Feed Stores, Ralston Purina Co., Prop., St. Louis 2, Mo.
 Clinton Industries, Inc., Clinton, Iowa
 Coatsworth and Cooper Ltd., 67 Yonge St., Toronto, Ont., Canada
 Colonial Feed Dealers Cooperative Assn., Inc., LaRose, Ill.
 Commander-Larabee Milling Co., Minneapolis, Minn.
 Consolidated Distilleries, Inc., East Taunton, Mass.
 Consolidated Products Co., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Continental Distilling Corp., 1429 Walnut St., Philadelphia 2, Penn.
 O. A. Cooper Co., Humboldt, Neb.
 Cooperative Alfalfa Mills, Inc., Box 1525 Central Station, Toledo, Ohio
 Corn Products Sales Co., 17 Battery Place, New York 4, N. Y.
 Courcy & Sons Grain Co., 12 Waverly St., Taunton, Mass.
 Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston 9, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
 Crookston Milling Co., Crookston, Minn.
- Dailey Mills, Inc., Olean, N. Y.
 Dairymen's League Co-operative Association, Inc., 11 West 42nd St., New York 18, N. Y.
 Dawe's Manufacturing Co., 4800 S. Richmond St., Chicago 32, Ill.
 Decatur Milling Co., Inc., Decatur, Ill.
 Dehydrating Process Co., 60 Mt. Washington Ave., Boston, Mass.
 Delaware Mills, Inc., 88 Front St., Deposit, N. Y.
 Denver Alfalfa Milling & Products Co., Lamar, Col.
 Frank Diauto, 87 Warren St., Randolph, Mass.
 F. Diehl & Son, Inc., Wellesley 81, Mass.
 Dietrich & Gambrell, Inc., Frederick, Md.
 Drackett Products Co., Cincinnati, Ohio
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.
- Eagle Roller Mill Co., New Ulm, Minn.
 East Bridgewater Farmers' Exchange, East Bridgewater, Mass.
 Eastern States Farmers' Exchange, West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 Economy Grocery Stores Corp., 393 D St., Boston, Mass.
 M. W. Ellis Estate, 19 Walnut St., Peabody, Mass.
 Elnore Milling Co., Inc., Oneonta, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Assn., Topsfield, Mass.
 Excelsior Milling Co., Minneapolis 15, Minn.
- Faesy & Besthoff, Inc., 220 East 42nd St., New York, N. Y.
 Farm Bureau Assn., 155 Lexington St., Waltham, Mass.
 Farmers Feed Co., 532 East 76th St., New York, N. Y.
 Federal Mill, Inc., Lockport, N. Y.
 E. H. Felton & Co., Indianola, Iowa
 Fernando Alfalfa Milling Co., 6104 Van Nuys Blvd., Van Nuys, Cal.
 Finger Lakes and Hudson Flour Mills, Inc., Geneva, N. Y.
 Fingerlakes & Hudson Flour Mills, Inc., 7 Madison St., Troy, N. Y.
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Flambeau Milling Co., Phillips, Wis.
 Flory Milling Co., Inc., Bangor, Penn.
 Fred A. Fountain, Taunton, Mass.
 Fremont Molasses Feed Co., Fremont, Neb.

J. B. Garland & Son, Inc., 15 Grafton St., Worcester, Mass.
 Gateway Milling Assn., Inc., Buffalo 13, N. Y.
 General Foods Corp., Battle Creek, Mich.
 General Foods Corp., Corn Mill Division, Kankakee, Ill.
 General Mills, Inc., Minneapolis 15, Minn.
 General Mills, Inc., Farm Service Division, Buffalo 3, N. Y.
 General Mills, Inc., Larrowe Division, Detroit 2, Mich.
 Gerard Co., Baltimore 5, Md.
 Getek Industrial & Agricultural Supplies Corp., 1270 Sixth Ave., New York 20, N. Y.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis, Ind.
 Glidden Co., Soya Products Division, 2165 W. Moffat St., Chicago 39, Ill.
 Gloucester Dehydrating Process Co., Gloucester, Mass.
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., New York, N. Y.
 Gwinn Milling Co., Columbus 9, Ohio.

Hales & Hunter Co., 166 West Jackson Blvd., Chicago 4, Ill.
 D. Harbeck & Sons, New Bedford, Mass.
 Harper Feed Mills, Inc., Washington, Penn.
 Henkel Flour Mills, Division of International Milling Co., Minneapolis 1, Minn.
 Hercules Powder Co., Dairy Products Division, 332 S. Michigan Ave., Chicago, Ill.
 D. B. Hodekins' Sons, 30 Pearl St., Gloucester, Mass.
 H. P. Hood & Sons, Inc., 500 Rutherford Ave., Boston 29, Mass.
 Hood Mills Co., Baltimore 5, Md.
 E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
 Hubinger Co., Keokuk, Iowa

Illinois Cereal Mills, Inc., Paris, Ill.
 Illinois Yeast Co., Princeton, Ill.
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.
 International Milling Co., 800 McKnight Bldg., Minneapolis 1, Minn.

Jaquith & Co., Woburn, Mass.

Kasco Mills, Inc., Waverly, N. Y.
 Kellogg Co., Battle Creek, Mich.
 Kellogg Co., Omaha, Neb.
 Kellogg Milling Co., 280 New Chamber of Commerce, Minneapolis 15, Minn.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 Keystone Dehydrators, Box 204, Nazareth, Penn.
 Chas. J. Koelsch Grain Co., 177 Milk St., Boston, Mass.
 Krait Foods Co., 500 Peshtigo Court, Chicago 90, Ill.
 Chas. A. Krause Milling Co., Milwaukee 1, Wis.

Larabee Flour Mills Co., Kansas City, Mo.

Mackenzie & Winslow, Inc., Fall River, Mass.
 Maine Fish Meal Co., Union Wharf, Portland, Maine
 Mansfield Milling Co., Mansfield, Mass.
 Maritime Milling Co., Inc., 1009 Chamber of Commerce, Buffalo 2, N. Y.
 May Way Mills, Inc., Kansas City 6, Mo.
 Meech & Stoddard, Inc., Middletown, Conn.
 Mellin's Food Co. of North America, Boston, Mass. (Registered for A. H. Brown & Bros.)
 Merrimack Farmers' Exchange, Inc., Concord, N. H.
 Methuen Grain Co., Methuen, Mass.
 F. R. Miller Feed Mills, 6016 South 30th St., Omaha 7, Neb.
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.
 Geo. O. Moon & Co., Inc., Binghamton, N. Y.
 Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.

National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.
 National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
 National Lead Co., 111 Broadway, New York 6, N. Y.
 National Milling Branch of National Biscuit Co., 2221 Front St., Toledo, Ohio
 Nebraska Farm Products, Cozad, Neb.
 Neamond Co., 300 Merchants Exchange Bldg., St. Louis, Mo.
 New Bedford Grain Co., New Bedford, Mass.
 New England Grain Co., 390 Commercial St., Portland, Maine.
 North Dakota Mill & Elevator, Grand Forks, N. Dak.
 Northwest Distributing Co., Colby, Wis.
 Northwestern Yeast Co., 1750 North Ashland Ave., Chicago 22, Ill.

P. Fried'k Obrecht & Son, Baltimore 5, Md.
 Ogden Grain Co., Utica, N. Y.
 Oswego Soy Products Corp., Oswego, N. Y.

Palm Grain Co., 1081 Gorham St., Lowell, Mass.
 Philip R. Park, Inc., Outer Harbor, San Pedro, Cal.
 Park & Pollard Co., 356 Hertel Ave., Buffalo 7, N. Y.
 George H. Parker Grain Co., 56 Water St., Danvers, Mass.
 Pasco Packing Co., Dade City, Florida
 Patent Cereals Co., Geneva, N. Y.
 Pierce Grain Corp., 1035 Seneca St., Buffalo 10, N. Y.
 Pillsbury Mills, Inc., Minneapolis 2, Minn.
 Pittsburgh Plate Glass Co., Linseed Oil Division, 2-10 Chester Ave., Newark, N. J.
 W. N. Potter Grain Stores, Inc., Greenfield, Mass.
 Procter & Gamble Distributing Co., Cincinnati 1, Ohio.
 Publicker Industries, Inc., 1429 Walnut St., Philadelphia, Penn.

Quaker Oats Co., 141 W. Jackson Blvd., Chicago 4, Ill.

Ralston Purina Co., St. Louis 2, Mo.
 John Reardon & Sons Division of Wilson & Co., Inc., Cambridge, Mass.
 D. F. Riley, North Hatfield, Mass.
 Rodney Milling Co., Kansas City 8, Mo.
 Russell-Miller Milling Co., Minneapolis 1, Minn.
 Ryther & Warren Co., Belchertown, Mass.

Saunders Mills, Inc., Toledo, Ohio
 Schenley Distilleries, Inc., 350 Fifth Ave., New York 1, N. Y.
 Schooneck Farms, Inc., Nazareth, Penn.
 Joseph E. Seagram & Sons, Inc., Louisville, Ky.
 Shearer's Dried Milk Products Corp., 1046 Public Ledger Bldg., Philadelphia, Penn.
 Sherwin-Williams Co., 101 Prospect Ave., N. W., Cleveland 1, Ohio
 Sioux Soya Co., Sioux City, Iowa
 W. J. Small Co., Inc., Kansas City, Kan.
 Southwestern Sugar & Molasses Co., P. O. Box 10, McAllen, Texas
 A. E. Staley Manufacturing Co., Decatur, Ill.
 Staley Milling Co., North Kansas City 16, Mo.
 Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
 D. A. Stickell & Sons, Inc., Hagerstown, Md.
 Stratton & Co., Concord, N. H.
 Sunny Slope Farms, Nazareth, Penn.
 Sunshine Stores, Inc., Fort Wayne, Ind.
 Swift & Co., Union Stock Yards, Chicago 9, Ill.
 Swift & Co., Soybean Mills, Champaign, Ill.

Taunton Grain Co., Taunton, Mass. (Successors to Est. M. G. Williams)
 Texsun Citrus Exchange, Weslaco, Texas
 Tioga Mills, Inc., Waverly, N. Y.
 Toledo Soybean Products Co., Toledo, Ohio
 Jacob Trinley & Sons, Inc., Linfield, Penn.

Union Sales Corp., Columbus, Ind. (Distributors for Union Starch & Refining Co.)
 United Cooperative Farmers, Inc., Fitchburg, Mass.
 United Farmers Cooperative Creamery Assn., Inc., Charlestown, Mass.
 United Mills Co., Inc., Grafton, Ohio
 Unity Feeds, Inc., 177 Milk St., Boston
 George Urban Milling Co., 332 North Oak St., Buffalo 3, N. Y.

Valley Dehydration Plant, McAllen, Texas
 Van Vex Mills, Inc., 196 Smith St., Rochester, N. Y.
 Arthur Ventura Grain Co., Taunton, Mass.
 Vita-Vim Millers, 135 Scott St., Buffalo 4, N. Y.
 O. B. Vunck & Co., Voorheesville, N. Y.

Wakefield Sawdust & Shavings Co., Wakefield, Mass.
 Hiram Walker & Sons, Inc., Peoria 1, Ill.
 Wapsie Valley Feed Co., Independence, Iowa
 C. P. Washburn Co., Middleboro, Mass.
 Wayne County Grangers Feed Corp., Clyde, N. Y.
 H. K. Webster Co., Lawrence, Mass.
 Welco Feed Manufacturing Co., Spencer, Iowa
 West-Nesbitt, Inc., Oneonta, N. Y.
 Western Condensing Co., Petaluma, Cal.
 Whitmoyer Laboratories, Inc., Myerstown, Penn.
 Williams Bros. Co., Kent, Ohio
 Est. M. G. Williams, Taunton, Mass. (Taunton Grain Co., Successors)
 Stanley Wood Grain Co., Taunton, Mass.
 Worcester Grain & Coal Co., Worcester, Mass.

Yaggie Mills, Yankton, S. D.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 130

JULY 1946

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventy-third report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

MASSACHUSETTS STATE COLLEGE
AMHERST, MASS.

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INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1946

By Fertilizer Control Service Staff:

Philip H. Smith,¹ *Official Chemist in Charge*
John W. Kuzmeski, *Senior Chemist*
Albert F. Spelman, *Assistant Chemist*
C. Tyson Smith, *Assistant Chemist*
Henry B. Rodman, *Junior Chemist*
¹Retired

James T. Howard, *Inspector*
Joseph Conklin, *Inspector*
Harvey E. Barké, *Inspector*
Joseph A. Martell, *Technical Assistant*
Cora B. Grover, *Senior Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesia.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1.

Tonnage fee: 6 cents per ton of 2,000 pounds.

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

Manufacturers and Brands

Registrations have been perfected in Massachusetts during 1946 by 65 firms, covering 238 brands of mixed fertilizer and unmixed fertilizing materials.

The following brands were not found on display by the sampling agent at any point in the state and therefore do not appear in the tables of analyses.

Brands of Fertilizer Registered but Not Sampled

Allied Chemical & Dye Corp., The Barrett Division Sulphate of Ammonia (20.6-0-0)	Davey Tree Expert Co. Davey Shredded Manure (2-1-1)
American Cyanamid Co. 21% Aero Cyanamid Pulverized (21-0-0)	E. I. du Pont de Nemours & Co. Du Pont Uramon Fertilizer Compound (42-0-0)
American Potash & Chemical Corp. Trona Muriate of Potash (0-0-60)	Eastern States Farmers' Exchange Cottonhull Ash (0-0-30) Triple Superphosphate 47% (0-47-0)
Apothecaries Hall Co. Liberty Home Garden Fertilizer 5-10-5 Liberty Fertilizer (with Sulphate Potash) 5-10-10 Bone Meal (2.25-22-0) Castor Pomace (4.5-0-0) Sulphate Ammonia (20.5-0-0)	Grasalo Co. Grasalo Chemical Fertilizer 5-8-7
Armour Fertilizer Works Armour's Big Crop Fertilizer 0-14-14 Armour's Garden Fertilizer 5-10-5 Muriate of Potash 60% (0-0-60)	Olds & Whipple, Inc. O & W 5-3-5 Complete Tobacco O & W 5-10-10 Potato
Chilean Nitrate Sales Corp. Chilean Nitrate of Soda—Original Old Style (16-0-0)	Plantspur Products Co. Plantspur 4-4-2
Consolidated Chemical Industries, Inc. C.C.I. Brand Raw Bone Meal (3.6-20-0)	Ra-Pid-Gro Corporation Ra-Pid-Gro 23-21-17
Consolidated Rendering Co. Corenco 6-3-6 Special Tobacco Grower Corenco 8-16-16 Two-in-One	Rogers & Hubbard Co. Red H 8-16-16
	William H. Rorer, Inc. Plant Dinner 5-7-5
	O. M. Scott & Sons Co. Scotts Turf Builder 8-7-3
	Swift & Co., Plant Food Division Swift's Red Steer 5-10-5

FERTILIZER TONNAGE
Tonnage of Fertilizers Sold in Massachusetts

	Jan. 1, 1944, to Jan. 1, 1945	1945	
		Jan. 1 to July 1	July 1 to Jan. 1
Mixed fertilizers	61,824	60,040	5,112
Fertilizer chemicals and materials unmixed	12,466	9,857	2,567
Pulverized animal manures	1,573	1,488	354
Totals	75,863 <i>a</i>	71,385 <i>a</i>	8,033 <i>a</i>

a Does not include tonnage distributed by A.A.A.

Tonnage of Mixed Fertilizers, January 1, 1945, to January 1, 1946

Grade*	Tonnage		Brands	Grade*	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31			Jan. 1 to July 1	July 1 to Dec. 31	
5-8-7	17,600	1,305	21	8-4-8	178	—	—
5-10-10	15,572	662	21	5-10-4	137	17	—
6-3-6	6,709	223	12	6-5-5	85	—	—
7-7-7	4,905	1,008	10	6-12-4	63	13	—
5-10-5	4,854	238	26	0-10-20	62	5	—
4-12-4	3,153	471	10	8-9-3	60	60	—
8-16-16	2,014	235	6	5-15-20	50	23	—
4-12-8	1,728	16	6	4-8-4	43	2	—
8-24-8	678	17	—	5-8-5	15	—	—
10-10-10	501	339	—	5-5-15	11	—	—
6-10-4	425	87	—	3-12-6	10	—	—
0-14-14	396	123	6	5-7-4	10	—	—
6-8-2	302	93	—	6-6-4	10	5	—
4-12-16	253	126	—	Miscellaneous	29	25	12
5-3-5	187	19	—	Totals	60,040	5,112	151

*The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1, 1945, to January 1, 1946

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Nitrate of soda	3,334	264	—
Superphosphate 20%	1,624	581	9
Pulverized animal manures	1,488	354	21
Superphosphate 18%	1,083	290	—
Muriate of potash	807	80	9
Milorganite	795	585	—
Bone meal	650	91	10
Ammonium nitrate	497	122	—
Cottonseed meal	236	307	—
Sulphate of ammonia	232	138	5
Castor pomace	218	36	—
Cyanamid	184	21	—
Fish	100	—	—
Superphosphate 47%	41	21	—
Bone and tankage	22	22	—
Uramon	22	5	—
Tankage	10	—	—
Miscellaneous	2	4	—
Totals	11,345	2,921	79

MIXED FERTILIZERS
Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
Acme Guano Co.	3	3	9	0	0	0	0
Agricultural Laboratories, Inc.	3	1	0	0	0	0	4
American Agricultural Chemical Co.	43	30	127	12	4	0	1
American Liquid Fertilizer Co., Inc.	1	0	3	2	0	0	0
Apothecaries Hall Co.	16	16	47	0	0	0	0
Armour Fertilizer Works.	16	13	48	2	2	0	0
F. A. Bartlett Tree Expert Co.	1	0	3	1	0	0	0
Berkshire Chemical Co.	15	12	45	4	0	0	0
Joseph Breck & Sons Corporation.	5	5	15	0	0	0	0
Consolidated Rendering Co.	21	17	62	3	0	0	1
Davey Tree Expert Co.	1	0	3	0	0	1	1
Doggett Pfeil Co.	1	1	3	0	0	0	0
Eastern States Farmers' Exchange.	32	20	114	6	1	2	5
Essex County Co-operative Farming Association.	3	3	10	0	0	0	0
Excell Laboratories.	2	2	6	0	0	0	0
Frost & Higgins Co.	1	0	3	1	0	0	0
Goulard & Olena, Inc.	3	1	9	1	1	1	0
Hydroponic Chemical Co., Inc.	4	3	12	0	0	0	2
Hy-Trous Corporation.	2	1	6	1	0	0	0
International Minerals & Chemical Corporation.	27	17	84	4	3	2	2
McCormick & Co., Inc.	1	1	3	0	0	0	0
Miller Chemical & Fertilizer Corp.	1	1	3	0	0	0	0
Mr. O's Products.	1	0	1	1	0	0	0
Old Deerfield Fertilizer Co., Inc.	26	15	79	2	5	4	3
Olds & Whipple, Inc.	10	10	30	0	0	0	0
F. G. Phillips Co.	2	2	6	0	0	0	0
Plantabbs Co.	2	2	6	0	0	0	0
Ralston Purina Co.	2	2	6	0	0	0	0
Rogers & Hubbard Co.	29	28	85	1	0	0	0
O. M. Scott & Sons Co.	2	0	6	1	1	1	1
Sears, Roebuck & Co.	2	1	6	1	0	0	0
M. L. Shoemaker Div. of Wilson & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	2	2	6	0	0	0	0
Standard Wholesale Phosphate & Acid Works, Inc.	2	2	6	0	0	0	0
Swift & Co., Plant Food Division.	6	4	18	1	1	0	0
Tennessee Corporation.	3	3	9	0	0	0	0
Universal Chemical Co.	2	1	6	0	1	0	0
C. P. Washburn Co.	4	3	12	1	0	0	0
Woodruff Fertilizer Works, Inc.	2	1	6	1	0	0	0
	300	224	914	46	19	11	20

Average Variation from Guaranteed Analysis

Fourteen firms have registered three or more brands of mixed fertilizers. On the basis of composition found by analysis as well as of tonnage sold, each manufacturer was successful in maintaining the average plant food guarantees in his mixtures.

The following table shows that fertilizer manufacturers were more successful in maintaining plant food guarantees in 1946 than in any one of the past ten years. This decided improvement reflects the apparently general practice of the manufacturers to allow a more generous average overrun in formulating their 1946 mixtures.

Year	Number of Tests Made	Percentage of Tests Meeting Guarantee
1937	910	87
1938	1,026	87
1939	1,003	79
1940	895	75
1941	917	85
1942	770	80
1943	1,205	79
1944	1,250	75
1945	920	79
1946	914	90

Calculation of Shortages

For calculating the approximate commercial shortages per ton the following figures were used:

	Retail Cost Per Unit
Nitrogen:	
Water-soluble and synthetic organic.....	\$2.00
Water-insoluble of good quality and	
Water-soluble amounting to one-eighth of the percentage of	
water-insoluble nitrogen found when the percentage of	
water-insoluble nitrogen exceeds .50.....	8.00
Available phosphoric acid.....	1.40
Potash:	
Muriate.....	.80
Sulfate.....	1.10
From cotton hull and boll ashes and wood ashes.....	1.25

These values represent the average retail cost to the consumer of the plant food elements in *unmixed* materials. This does not include mixing and overhead costs which increase the retail cost of these elements in mixed goods.

To compensate for the increased unit cost in mixed goods the commercial shortage as found by using our values is multiplied by the factor: Actual retail selling price divided by our calculated guaranteed value.

Example: A 5-8-7 fertilizer selling for \$39.00 a ton analyzes:

Total nitrogen.....	4.67
Water-insoluble nitrogen.....	.88
Available phosphoric acid.....	7.43
Potash.....	7.13

Shortage: Nitrogen	$.33 \times \$2.00 = \0.66
Available phosphoric acid.....	$.57 \times 1.40 = .80$
Total.....	<u>\$1.46</u>

Our calculated guaranteed value:

Water-insoluble nitrogen.....	$= .88 + .11 = .99 \times \$8.00 = \$7.92$
Water-soluble nitrogen	$= 5.00 - .99 = 4.01 \times \$2.00 = 8.02$
Available phosphoric acid.....	$= 8.00 \times \$1.40 = 11.20$
Potash	$= 7.00 \times \$0.80 = 5.60$
Total.....	<u>\$32.74</u>

Approximate commercial shortage = $(39.00 \div 32.74) \times 1.46 = \1.74 per ton.

Explanation of Table of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

This table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton

Name of Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash Found	Where Sampled	Approximate Commercial Shortage Per Ton
	Water Insoluble	Total				
Agricultural Laboratories, Inc.						
Stimulant 11-12-15	4.39	4.43	10.65	10.64	Sanborn & Damon, Quincy	a
Stimulant 11-12-15 . . . . .	.31	10.18	14.52	17.99	Seaverns Store, North Scituate	a
American Agricultural Chemical Co.						
Agrico for Seeding Down 4-12-16 (b) . . . . .	.13	4.03	12.33	14.46	American Agricultural Chemical Co., N. Weymouth	\$1.50
Davey Tree Expert Co.						
Davey Tree Food 12-4-4 . . . . .	.76	11.23	5.52	3.49	B. L. Brittain, Newton Center	6.09
Eastern States Farmers' Exchange						
Eastern States 0-19-19 with Borax, 2% magnesium oxide	—	—	19.28	17.37	Eastern States Farmers' Exchange, N. Cambridge	1.53
Eastern States 0-20-20, 2% magnesium oxide (c)	—	—	22.44	17.67	Eastern States Farmers' Exchange, Taunton	2.12
Eastern States 0-20-20, 2% magnesium oxide (c)	—	—	18.24	20.19	Eastern States Farmers' Exchange, N. Cambridge	1.83
Eastern States 8-16-16, 1% magnesium oxide (b) . . . . .	.46	7.57	20.92	14.42	Edward F. Brooks, Middleboro	2.10
Eastern States 8-16-16, 1% magnesium oxide (d) . . . . .	.36	8.43	15.19	18.09	E. B. Parmenter, Franklin	1.12
Goulard & Oleno, Inc.						
G & O Rose Food 7-8-5	1.83	6.55	10.37	4.81	Quincy Motor Co., Inc., Quincy	a
G & O Rose Food 7-8-5	1.50	6.37	8.47	5.47	Clapper Co., West Newton	a
Hydroponic Chemical Co., Inc.						
Hyponex 7-6-19 (b) . . . . .	.20	6.09	7.96	15.82	W. T. Grant Co., Brockton	a
International Minerals & Chemical Corporation						
International 4-12-4 (b) . . . . .	.32	4.07	10.74	4.46	H. L. Deschamps, Acushnet	2.47
Old Deerfield Fertilizer Co., Inc.						
Old Deerfield 5-10-10 Potato Fertilizer (b) . . . . .	.93	5.93	8.79	9.94	Anthony Kuzneskus, Greenfield	2.03
Old Deerfield 5-10-10 Potato Fertilizer . . . . .	.59	5.77	9.20	10.35	John Savage, West Deerfield	1.33
Old Deerfield 5-10-10 Potato Fertilizer . . . . .	.66	5.75	9.10	10.19	D. M. Peckham, Rehoboth	1.55
O. M. Scott & Sons Co.						
Scotts Turf Builder 8-8-4	2.07	7.84	7.32	4.92	Moriarty Hardware Co., New Bedford	3.82
Scotts Turf Builder 8-8-4	1.32	7.00	7.52	4.96	Garden Tool House, Wellsley	7.22

a Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with other seriously deficient mixtures.

b See also table of "Mixtures substantially complying with guarantees."

c Magnesium oxide found: 3.29%, 3.47%.

d Magnesium oxide found: 1.77%.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Acme Guano Co.		
Acme 5-8-7	1	.57
Acme 5-10-5	1	.36
Acme 7-7-7	1	.29
American Agricultural Chemical Co.		
AA Quality Fertilizer 5-8-7	10	.36
AA Quality Fertilizer 5-10-10	14	.27
Agrico Phosphate & Potash 0-14-14	2	—
Agrico for Corn 3-12-6	2	.22
Agrico for New England 4-10-10	2	.18
Agrico for Gardens 4-12-4	2	.44
Agrico for Lawns, Trees & Shrubs 4-12-4	3	.33
Agrico for Corn 4-12-8	4	.24
Agrico for Seeding Down 4-12-16	1 a	.43
Agrico for Cranberries 5-8-7	2	.44
Agrico for New England 5-8-7	5	.32
Agrico for Onions 5-10-5	2	.27
Agrico for Potatoes 5-10-10	5	.22
Agrico for Tobacco 6-3-6	2 b	2.63
Agrico Country Club Fertilizer 6-10-4	2	.25
Agrico for Top Dressing 7-7-7	4	.15
American Liquid Fertilizer Co., Inc.		
Liqua-Vita 6-9-7	1	—
Apothecaries Hall Co.		
Liberty Fertilizer (with borax) 0-14-14	1	—
Liberty Fertilizer 4-12-4	2	.55
Liberty High Grade Market Gardeners 5-8-7	2	.70
Liberty Fertilizer 5-10-5	2	.75
Liberty Fertilizer 5-10-10	2	.73
Liberty Tobacco Mixture 6-3-6	1 b	2.59
Liberty Tobacco Mixture with Cotton Hull Ashes 6-3-6	2 b	3.53
Liberty Green Gro 6-7-4	2	.97
Liberty Special for Fruit & Grass 7-7-7	2	.65
Armour Fertilizer Works		
Armour's Big Crop Fertilizer 4-12-4	1	.53
Armour's Big Crop Fertilizer 4-12-8	1	.20
Armour's Big Crop Fertilizer 5-8-7	3	.31
Armour's Big Crop Fertilizer 5-10-5	3	.38
Armour's Big Crop Fertilizer 5-10-10	2	.36
Armour's Big Crop Tobacco Special 6-3-6	*1 b	3.50
Armour's Special Ornamental Fertilizer 6-12-4	3	.33
Armour's Big Crop Fertilizer 7-7-7	1	.33
Armour's Big Crop Fertilizer 8-16-16	1	.47
F. A. Bartlett Tree Expert Co.		
Bartlett Green Tree Food 6-8-6	1	.32
Berkshire Chemical Co.		
Berkshire Fertilizer 4-12-4	1	.25
Berkshire Fertilizer 5-8-7	3	.16
Berkshire Fertilizer 5-10-5	3	.24
Berkshire Fertilizer 5-10-10	2	.22
Berkshire Tobacco Fertilizer 6-3-6	2 b	3.16
Berkshire Specialty Fertilizer 6-6-4	1	.18
Berkshire Fertilizer 7-7-7	3	.17
Joseph Breck & Sons Corporation		
Breck's Country Club Fertilizer 8-6-2	2	.51
Brexone Garden-Gro 5-10-10, with 2% magnesium oxide	1	.22
Brexone Turf-Gro 8-6-2	2	.48
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser	1	—
Corenco 4-12-4 Complete Manure	2	.34
Corenco 5-8-7 Potato & General Crop	5	.17
Corenco 5-10-5 Home Garden Fertilizer	2	.27
Corenco Super Truck 5-10-5	1	.23
Corenco 5-10-10 Peerless Potato	4	.21
Corenco 7-7-7 Complete Fruit & Top Dressing	3	.16
Corenco 8-6-4 Landscape Fertilizer	3	.72
Doggett-Pfeil Co.		
D & P Rose Food 4-8-2	1	3.33
Eastern States Farmers' Exchange		
Eastern States 5-10-5 Victory Garden, 2% magnesium oxide	3	.28
Eastern States 5-10-10, 1% magnesium oxide	5	.27
Eastern States 5-15-5	1	.32
Eastern States 5-15-20	1	.38
Eastern States 8-4-8 Tobacco	2 b	2.96
Eastern States 8-16-16, 1% magnesium oxide	8 a	.47
Eastern States 8-16-16 Low Chlorine Special, 1% magnesium oxide	1 b	.43
Eastern States 8-24-8	2	.46
Eastern States 10-10-10, 1% magnesium oxide	4	.44

a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b Potash in forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Essex County Co-operative Farming Association		
S-X Brand 5-8-7	1	.22
S-X Brand 5-10-10, 2% magnesium oxide	1	.17
S-X Brand 7-7-7	1	.18
Excell Laboratories		
New Plant Life 2-1-2	2	.04
Frost & Higgins Co.		
Frost & Higgins Special Tree and Shrub Food 8-6-4	1	.60
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19	3 a	.08
Hy-Trons Corporation		
Hy-Trons 4-8-4	2	—
International Minerals & Chemical Corporation		
International 0-14-14	8	—
International 4-12-4	3 a	.31
International 4-12-8	1	.20
International 5-8-7	5	.23
International 5-10-5	2	.26
International 5-10-10	2	.17
International Caribee 5-10-10, 2% magnesium oxide	1	.45
International Potato 5-10-10, 2% magnesium oxide	2	.23
International Tobacco 6-3-6	2 b	2.08
International 7-7-7	2	.24
International Fruit 7-7-7, 3% magnesium oxide	1	.27
International 8-6-2	4	.49
International 8-16-16 1½% magnesium oxide	1	.37
McCormick & Co., Inc.		
Hy-Gro 13-26-13	1	.58
Miller Chemical & Fertilizer Corporation		
VHPF 5-25-15	1	.31
Mr. O's Products		
Mr. O's Liquid Fertilizer 10-6-3	1	—
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 4-12-8	3	.20
Old Deerfield 5-8-7 All Crop Fertilizer	5 c	.34
Old Deerfield 5-8-7 (2% magnesium oxide) Set Onion and Potato Fertilizer, Potash other than Muriate	1 b	.25
Old Deerfield 5-10-5 Trucker's Special	1	.46
Old Deerfield 5-10-10 Potato Fertilizer	5 a	.59
Old Deerfield 6-3-6 Complete Tobacco Fertilizer	5 b	3.76
Old Deerfield Lawnshrub 6-5-5	1	2.19
Old Deerfield 7-7-7 Grass Top Dressing	2	.21
Olds & Whipple, Inc.		
O & W 4-12-4 Market Garden Fertilizer	1	.49
O & W 5-8-7 Potato & General Purpose Fertilizer	3	.67
O & W 5-10-5 Fertilizer	1	.47
O & W 6-3-6 Blue Label Tobacco Fertilizer	2 b	2.78
O & W 6-3-6 Blue Label Tobacco Fertilizer, Potash derived from Cotton Hull Ash	2 b	2.85
O & W 7-7-7 Top Dressing & Grass Fertilizer	1	.41
Fred G. Phillips Co.		
Ferti-Flora 3-3-3	2	—
Plantabbs Co.		
Fulton's Plantabbs 11-15-20	2	.06
Ralston Purina Co.		
Purina Plant Food 5-10-5	2	.20
Rogers & Hubbard Co.		
Gro-Fast Plant Food 5-8-5	2	1.27
Hubbard Potato Fertilizer 5-8-7	2	1.25
Hubbard 5-8-7 Fertilizer with Borax	2	.50
Hubbard High Potash Fertilizer 5-10-10	2	1.36
Hubbard Tobacco Grower 6-3-6	3 b	2.83
Red H 0-14-14	1	—
Red H 4-12-4	2	.53
Red H 4-12-8	1	.51
Red H 5-8-7	5	.66
Red H 5-10-5	1	.55
Red H 5-10-10	4	.49
Red H 7-7-7	3	.43
Red H 7-7-7 Special	1	.90
Sears, Roebuck & Co.		
Garden Master Plant Food 5-10-5	2	.32
M. L. Shoemaker Division of Wilson & Co., Inc.		
Shoemaker's Swift-Sure Tobacco Starter 4-10-0	1	.96
Smith Agricultural Chemical Co.		
Sacco 4-12-4	2	.48

a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

b Potash in forms other than muriate.

c In one sample the potash was in form other than muriate.

Mixtures Substantially Complying with Guarantees—Concluded

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Standard Wholesale Phosphate and Acid Works, Inc.		
Standard 4-12-4	1	.24
Standard 5-10-5	1	.31
Swift & Co., Plant Food Division		
Swift's Red Steer 5-8-7	2	.33
Swift's Red Steer 5-10-10	1	.29
Vigoro 4-12-4	3	.31
Tennessee Corporation		
5-10-5 All-Purpose Loma	3	31
Universal Chemical Co.		
Electra Plant Food 5-10-3	2	2.22
C. P. Washburn Co.		
Market Garden 5-8-7	2	.32
Special Potato 5-10-10	2	.23
Woodruff Fertilizer Works, Inc.		
Woodruff's 5-8-7 Fertilizer	1	.69
Woodruff's Tobacco Fertilizer 6-3-6	1 <i>b</i>	2.54

b Potash in forms other than muriate.

NITROGEN COMPOUNDS

Ammonium Nitrate, Dried Blood, Calcium Cyanamid, Castor Pomace,
Nitrate of Soda, Sulphate of Ammonia

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
Allied Chemical & Dye Corp., The Barrett Division		
Arcadian the American Nitrate of Soda	16.24	16.00
Arcadian Nitrate of Soda	16.03	16.00
Arcadian Sulphate of Ammonia	21.18	20.60
Arcadian Sulphate of Ammonia	21.13	20.60
American Cyanamid Co.		
20.6% Aero Cyanamid Granular	20.20	20.60
Ashcraft-Wilkinson Co.		
Nitraprills Fertilizer Compound	33.66	33.50
Nitraprills Fertilizer Compound	33.41	33.50
Nitraprills Fertilizer Compound	33.89	33.50
Chilean Nitrate Sales Corporation		
Chilean Nitrate of Soda—Champion Brand	16.28	16.00
Chilean Nitrate of Soda—Champion Brand	16.07	16.00
Chilean Nitrate of Soda—Champion Brand	16.01	16.00
Chilean Nitrate of Soda—Champion Brand	16.09	15.00
Consolidated Rendering Co.		
Corenco Dried Blood	13.01	12.00
Ford Motor Co.		
Ford Ammonium Sulphate	21.04	20.80
Ford Ammonium Sulphate	21.18	20.80
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield Castor Pomace	6.08	5.50
Old Deerfield Sulphate of Ammonia	20.50	20.50
Olds & Whipple, Inc.		
O & W Castor Pomace	5.88	4.50
O & W Sulphate of Ammonia	20.66	20.50

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Dry Ground Fish, Animal Tankage, Milorganite

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid		Available Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed
Apothecaries Hall Co.						
Dry Ground Fish	9.98	9.00	7.07	5.00	—	—
Dry Ground Fish	10.24	9.00	6.41	5.00	—	—
Old Deerfield Fertilizer Co., Inc.						
Dry Ground Fish	9.72	9.46	7.50	5.00	—	—
Olds & Whipple, Inc.						
Menhaden Dry Ground Fish	10.19	9.00	6.51	5.00	—	—
N. Roy & Son						
Animal Tankage	7.51	7.00	12.11	8.00	—	—
Sewerage Commission of the City of Milwaukee						
Milorganite	5.78	6.00	3.11	—	2.69	2.00
Milorganite	6.21	6.00	2.93	—	2.67	2.00
Milorganite	6.00	6.00	3.08	—	2.66	2.00
Milorganite	6.01	6.00	2.86	—	2.54	2.00
Milorganite	6.26	6.00	2.96	—	2.52	2.00
Milorganite	5.84	6.00	3.08	—	2.66	2.00
Milorganite	6.11	6.00	3.08	—	2.68	2.00
Milorganite	6.36	6.00	3.03	—	2.73	2.00
Milorganite	6.12	6.00	2.98	—	2.60	2.00
Milorganite	6.26	6.00	3.36	—	2.92	2.00
Milorganite	6.09	6.00	2.88	—	2.56	2.00

Ground Bone

Manufacturer	Nitrogen		Total Phosphoric Acid		Degree of Fineness
	Found	Guaranteed	Found	Guaranteed	Coarser than 1.50 Inch
Armour Fertilizer Works	2.26	2.47	25.08	23.00	34.5
Consolidated Rendering Co.	3.43	2.47	23.18	23.00	42.3
	3.01	2.47	24.34	23.00	34.2
	3.85	4.00 ^a	19.55	20.00	—
Goulard & Olena, Inc. (b)	2.19	2.75	26.94	25.00	29.2
	2.18	2.75	29.90	25.00	15.9
	3.08	2.75	27.79	25.00	—
	2.11	2.75	29.65	25.00	—
A. H. Hoffman, Inc.	3.85	3.70	21.01	20.00	34.7
	3.87	3.70	19.62	20.00	45.1
Olds & Whipple, Inc.	2.87	2.47	27.00	22.00	37.2
Rogers & Hubbard Co.	2.92	2.00	26.26	23.00	29.7
	3.10	2.00	26.41	23.00	28.9
	4.39	4.00	23.79	23.00	26.3
Swift & Co., Plant Food Div.	2.56	2.47	25.60	23.00	34.8

Brands Showing Commercial Shortage of More than \$1 per Ton

Consolidated Rendering Co.	3.74 ^c	4.00	19.38	20.00	80.9
John Reardon & Sons Div. of Wilson & Co., Inc.	4.60 ^d	2.47	13.38	15.00	43.9
	4.76 ^e	2.47	12.74	15.00	—

^a Corenco Raw Bone & Tankage.

^b G & O Reinforced Ground Bone. Approximate composition: 25% bone meal; 5% ammonium sulfate and urea; 70% phosphate rock.

^c Corenco Raw Bone & Tankage. Commercial shortage per ton, \$2.85.

^d Commercial shortage per ton, \$2.30.

^e Commercial shortage per ton, \$3.21.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
18% Normal Superphosphate	19.85	19.29	18.00
18% Normal Superphosphate	19.35	18.47	18.00
Apothecaries Hall Co.			
Superphosphate 20%	21.77	20.89	20.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%	22.47	20.29	20.00
Consolidated Rendering Co.			
Corenco Superphosphate 20%	20.55	20.39	20.00
Davison Chemical Corporation			
Davco Granulated 20% Superphosphate	21.72	20.82	20.00
Eastern States Farmers' Exchange			
Eastern States Superphosphate 20%	21.82	20.74	20.00
Eastern States Superphosphate 20%	20.55	20.07	20.00
International Minerals & Chemical Corporation			
International 20% Superphosphate	21.77	20.91	20.00
International 20% Superphosphate	20.45	20.33	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield Superphosphate 20%	20.55	20.55	20.00
Olds & Whipple, Inc.			
O & W Triple Superphosphate 47%	46.66	46.50	47.00
Rogers & Hubbard Co.			
Hubbard 20% Superphosphate	19.60	19.60	20.00
Hubbard 20% Superphosphate	21.31	20.11	20.00
Ruhm Phosphate & Chemical Co.			
Red Seal Brand Ruhm's Phosphate Rock 30%	33.62 <i>a</i>	—	—

Brands Showing Commercial Shortage of More than \$1 per Ton

Consolidated Rendering Co.			
Corenco Superphosphate 20%	18.99	18.89 <i>b</i>	20.00
Swift & Co., Plant Food Division			
Red Steer Superphosphate 20%	18.85	18.27 <i>c</i>	20.00

a Guaranteed total phosphoric acid 30%; no available phosphoric acid guaranteed

b Commercial shortage, \$1.39 per ton.

c Commercial shortage, \$2.39 per ton.

POTASH COMPOUNDS

Muriate and High Grade Sulfate of Potash

Manufacturer	Muriate of Potash		High Grade Sulfate of Potash		Chlorine
	Water Soluble Potash		Water Soluble Potash		
	Found	Guaranteed	Found	Guaranteed	
Apothecaries Hall Co.	59.80	60.00	—	—	—
Eastern States Farmers' Exchange . . .	60.32	60.00	47.92	48.00	1.68
Farm Bureau Association	61.09	60.00	—	—	—
	61.16	60.00	—	—	—
International Minerals & Chemical Corp.	60.32	60.00	—	—	—
Old Deerfield Fertilizer Co., Inc. . . .	58.92	60.00	—	—	—
Olds & Whipple, Inc.	—	—	49.24	48.00	1.52

PULVERIZED ANIMAL MANURES

In the following table the grade of the manure is given with the brand name. The grade is the guaranteed content of nitrogen, phosphoric acid and potash and in that order. In some cases the phosphoric acid guarantee represents total phosphoric acid; in others, available phosphoric acid. Past experience has shown that practically all of the total phosphoric acid is in available form.

Since animal manures generally are purchased for qualities other than their low nitrogen, phosphoric acid, and potash content that may be obtained much more economically in other materials, the percentages given under the headings "Organic Matter" and "Acid Insoluble Ash (Sand)" are highly significant. Some samples of sheep manure analyzed by the Control Service have run as high as 60 percent sand and as low as 27 percent organic matter. If two samples of sheep manure each contain about the same quantity of extraneous organic matter such as bedding materials, etc., it seems reasonable to assume that the sample containing 60 percent sand has 35 percent less of those qualities so greatly prized by some plant growers that they are willing to pay a high premium for them than a sample containing 25 percent sand. Both lots probably would be sold at the same price.

The Association of Official Agricultural Chemists has this definition for dried manures: "Dried, pulverized, or shredded manures are what the name indicates, and not mixtures of manures and other materials." While it is realized that a certain amount of sand and foreign organic material in animal manures is unavoidable, and that in sheep manures a higher sand content than in other animal manures is to be expected, it would seem desirable to establish a maximum quantity that an animal manure may contain. If the manure exceeded the sand content maximum it would be labeled "sheep manure-sand mixture." Any brand containing over 50 percent sand would be labeled "sand-sheep manure mixture."

FERTILIZERS AND AGRICULTURAL LIME

Pulverized Animal Manures

Manufacturer and Brand		Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash	Organic Matter	Acid Insoluble Ash (a)	Moisture
American Agricultural Chemical Co.							
	Pulverized Sheep Manure (1.25-1-1)	1.95	1.41	1.63	41.35	38.72	5.62
	Pulverized Sheep Manure (1.25-1-1)	1.84	1.30	1.63	42.13	36.24	7.88
Apothecaries Hall Co.							
	Liberty Sheep Manure (1-5-1)	1.79	1.54	3.80	47.47	28.95	8.46
Armour Fertilizer Works							
	Armour's Shredded Cattle Manure (1.75-1-1)	1.14	.93	.66	29.14	47.05	5.08
	Armour's Pulverized Sheep Manure (1.5-1-2.5)	1.91	1.54	2.42	47.97	32.55	6.99
	Armour's Pulverized Sheep Manure (1.5-1-2.5)	1.56	1.22	1.47	37.99	37.18	7.28
Atkins & Durbow, Inc.							
	Driconure (2-1-1)	2.82	2.24	1.44	59.95	21.15	9.95
	Driconite (2-1-1)	2.89	2.65	1.59	67.89	13.60	7.62
Buell Fertilizer Co.							
	Buell Peat-Poultry Manure (3-3-1.5)	3.22	3.59	1.71	67.58	4.38	15.13
Consolidated Rendering Co.							
	Corenco Sheep Manure (1.25-1-2)	1.54	1.38	3.41	43.30	38.74	5.34
	Corenco Sheep Manure (1.25-1-2)	1.64	1.43	3.45	41.42	39.90	5.67
	Spurz-On (3.5-3.5-1.5)	4.01	3.75	1.82	83.54	3.33	3.33
	Spurz-On (3.5-3.5-1.5)	3.88	3.79	1.59	71.87	4.71	6.83
Glendale Poultry Farms							
	Biff Peat-Poultry Manure (2-3-1)	2.82	4.31	2.13	65.13	3.97	12.78
A. H. Hoffman, Inc.							
	Hoffman Cow Manure (Dehydrated) (2-1-1)	2.24	1.48	2.21	83.05	1.65	6.27
	Hoffman Cow Manure (Dehydrated) (2-1-1)	2.22	1.69	2.13	81.36	1.98	7.53
	Hoffman Poultry Manure (Dehydrated) (3-1-1.5)	3.59	3.53	1.71	72.76	0.36	5.79
	Hoffman Poultry Manure (Dehydrated) (3-1-1.5)	3.80	3.98	1.82	69.60	7.45	6.99
	Hoffman Sheep Manure (Kiln Dried) (1.5-1-2.5)	1.54	1.46	3.99	44.86	35.83	4.92
	Hoffman Sheep Manure (Kiln Dried) (1.5-1-2.5)	1.57	1.40	3.30	39.92	43.62	3.60
International Minerals & Chemical Corp.							
	International Sheep Manure (1.25-1-2)	1.81	1.53	1.71	41.59	36.01	6.79
	International Sheep Manure (1.25-1-2)	1.42	1.21	1.30	37.93	35.58	7.83

a The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food.

Pulverized Animal Manures—Concluded

Manufacturer and Brand		Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash	Organic Matter	Acid Insoluble Ash (a)	Moisture
Norwood Brand Fertilizer Co.							
Norwood Brand Sheep Manure (1.83--89-1.03)		2.02	.35	4.19	41.44	41.77	5.81
Norwood Brand Sheep Manure (1.83--89-1.03)		1.53	.16	2.87	38.81	42.60	3.42
Pulverized Manure Co.							
Wizard Brand Cow Manure (2-1-1)		2.27	1.68	2.21	50.14	35.22	7.28
Wizard Brand Cow Manure (2-1-1)		1.81	1.07	1.67	52.55	36.03	5.20
Wizard Brand Pulverized Sheep Manure (2-1-2)		1.80	1.89	3.37	56.73	33.40	7.25
Wizard Brand Pulverized Sheep Manure (2-1-2)		1.86	2.34	3.60	53.45	37.68	4.85
Rogers & Hubbard Co.							
Gro-Fast Cow Manure (2-1-1)		2.51	2.45	1.59	56.85	20.78	12.63
Gro-Fast Cow Manure (2-1-1)		2.72	3.73	1.98	63.44	14.47	11.68
Gro-Fast Sheep Manure (1.25-1-2.5)		1.84	2.10	3.09	41.06	35.49	6.03
Gro-Fast Sheep Manure (1.25-1-2.5)		1.49	1.39	3.72	41.49	38.93	5.68
Scars, Roebuck & Co.							
Garden Master Sheep Manure (1.5-1-2.5)		1.76	1.58	3.91	47.23	31.84	7.51
Garden Master Sheep Manure (1.5-1-2.5)		1.86	1.61	3.94	49.62	26.40	8.58
Stockdale Fertilizer Co.							
Ovene (Sheep Manure) (2-1-1)		2.26	1.49	2.87	70.44	9.64	6.93
Swift & Co., Plant Food Division							
Sheep Manure (1.5-1-2.5)		1.86	1.32	2.13	57.80	29.67	6.09
Walker-Gordon Laboratory Co.							
Bovung (2-1-1)		2.19	1.70	2.40	82.80	2.64	3.21
Bovung (2-1-1)		2.18	1.86	1.98	80.30	3.14	3.78

a The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food

MISCELLANEOUS MATERIALS

In addition to its regular inspection work on fertilizers and agricultural lime materials, the Fertilizer Control Service each year receives a number of miscellaneous samples with requests for analysis from citizens of the Commonwealth. If the results of a particular analysis will be of interest to the general public or to the Control Service, and the work will not interfere with the inspection duties, the analysis is made and the results reported to the applicant. During the past fifty or more years, a record of analytical work on a wide assortment of materials has been accumulated. The following table gives the composition of a selected number of these materials.

Although time and changing requirements may have diminished interest in the composition of some of the samples analyzed early in the history of the Control Service, they are included in the list because of their unusual character or origin.

It is emphasized that the results reported here should be regarded only as a rough approximation of the true composition of other samples of the material that the samples listed represent. Especially in the case of ashes, animal manures, and industrial wastes, such variable factors as the sand and water content, the amount and kind of litter or bedding material present, and the kind of feed used, make it impossible for one set of values to be applicable to all samples of hard pine ashes or to all samples of turkey manure, etc.

The data on samples received before 1919 are taken from a special bulletin issued by the Massachusetts Agricultural Experiment Station in November 1919 and entitled "Compilations of Analyses".

Miscellaneous Materials

	Water	Nitrogen	Total Phosphoric Acid	Potash	Calcium Oxide	Magnesium Oxide	Organic Matter	Sand
Ashes								
Brazil nut.....	1 0	—	7.0	16.3	14.5	8.3	—	—
Corn cob.....	4 5	—	4.9	31.1	5.1	—	—	34.4
Hemp.....	5 9	—	1.4	2.4	—	8.6	—	26.3
Jute waste.....	.2	—	.5	.5	6.0	.4	—	81.0
Leather, sole.....	1.2	—	2.4	1.9	5.6	—	—	—
Peat.....	.9	—	.4	1	1.3	—	—	—
Pine, hard.....	.8	—	2.2	10.2	25.0	—	—	—
Pine, soft.....	2 8	—	3.1	4.4	3.9	1.2	—	—
Rubber tires, automobile.....	3 7	—	1.1	1.1	6.9	3.3	—	—
Soot, oil used as fuel.....	—	.6	1	.04	.2	.3	—	—
Soot, soft coal fuel.....	—	.9	.1	.02	.6	.3	—	—
Seaweed.....	1.7	—	.4	2.1	4.6	3.2	—	2.3
Walnut wood.....	3 8	—	2.1	5.1	40.7	—	—	—
Wood, mixed.....	13 3	—	1.5	5 6	31 8	3.3	—	16 7
Lime Materials, Marine								
Clam shells.....	.9	.2	.1	—	51.7	.1	—	—
Coquina shells.....	1	—	—	—	46.5	.9	—	—
Coral.....	39 6	.3	3.7	—	27.3	—	—	—
Crab meal, Chesapeake Blue.....	4 4	5 0	3.2	—	23.0	—	—	—
Crab and lobster shell meal.....	2 8	3 5	2.6	—	31.2	2.1	—	—
Lobster shells.....	7 3	4.5	3.5	—	22.2	1.3	—	—
Oyster shells.....	3 0	—	—	—	49.1	.7	—	—
Starfish, whole, vacuum dried.....	3 1	5 4	1.1	—	21.1	—	—	—
Vegetable Materials								
Apple pomace.....	81 1	.6	.1	1	—	—	—	—
Banana skins.....	13 9	.2	1.8	5.5	—	—	—	—
Banana stalks.....	78 7	.2	.1	1 8	.2	.1	2.5	—
Banana stalk fiber, dried.....	4 4	.9	.6	10 6	—	—	76.4	1.4
Bark residue, after extraction of tannic acid.....	74 7	.6	.1	.1	1.8	.1	21.5	—
Cinchona bark residue.....	8 0	.9	.6	.1	10.5	3.1	56.8	—
Cocoa bean residue, fat removed.....	8 8	3 6	1.6	1.8	—	—	83.7	—
Cocoa shells.....	1 7	2.3	.8	2.7	—	—	—	—
Coconut shells.....	4 9	1	.1	.2	—	—	—	—
Coconut oil meal.....	9 3	3 8	1.4	2.1	—	—	85.8	—
Coffee chaff.....	4 8	2.4	.6	2.3	2.3	.9	85.3	—

Coffee grounds.....	5.6	2.0	.4	.5	—	—	—	93.1	—	
Coffee shells.....	5.3	2.0	.3	1.6	—	—	—	—	—	
Cottonseed hulls.....	6.8	.3	.3	1.3	—	—	—	—	—	
Cottonseed hull bran.....	—	.5	.1	1.0	.2	.3	.3	—	—	
Gall nuts residue.....	63.7	.6	.2	.1	.2	.1	.1	13.3	.6	
Hemp waste.....	73.7	.5	.2	.2	.3	.2	.2	22.5	—	
Hop refuse from brewery.....	84.0	.9	.7	.1	.3	.2	.1	14.4	—	
Jute waste.....	13.1	.7	.7	.1	.1	—	—	—	—	
Kapok seed.....	7.3	3.8	1.4	1.7	—	—	—	—	—	
Laplace root, extracted.....	8.5	.8	.1	.1	—	—	—	85.8	2.4	
Maple leaves.....	5.8	.3	—	—	—	—	—	82.0	—	
Mowrah meal.....	5.8	2.8	1.8	1.9	.2	.3	.3	—	—	
Oat hulls.....	5.8	.6	.4	.7	—	—	—	88.1	—	
Peanut shells.....	8.4	1.4	.2	.8	.3	.3	.3	88.5	—	
Peanut skins.....	5.5	2.9	.7	.6	—	—	—	91.6	—	
Pecan shells.....	4.3	.4	.1	.5	—	—	—	83.3	—	
Pine needles.....	9.5	.5	.1	.03	—	—	—	87.1	1.7	
Plankton, drained, dried at 80° C.....	2.5	8.4	1.8	1.7	1.0	1.0	1.3	64.6	2.7	
Plankton, washed, dried at 80° C.....	4.6	9.6	2.0	1.2	1.0	1.0	.8	76.9	3.9	
Plankton, pressed, dried at 80° C.....	3.7	9.0	1.8	1.2	1.0	1.0	1.4	72.2	3.5	
Sesame oil meal.....	6.6	7.0	2.4	1.0	—	—	—	82.1	3.0	
Spanish moss dust.....	7.3	1.1	.2	.4	.9	.9	1.1	81.1	—	
Sugar cane fiber, dried.....	5.9	.4	.1	.3	.1	.1	.3	86.3	6.0	
Tomato cannery refuse, skins and seeds.....	6.5	3.2	.5	.7	.1	.1	.2	90.9	—	
Tomato pulp, dried.....	9.5	2.6	1.0	5.6	—	—	—	80.5	—	
Tobacco dust.....	5.0	1.8	.6	2.9	3.1	3.1	—	—	11.0	
Tobacco leaves.....	5.0	3.6	.5	6.5	6.7	6.7	1.3	—	31.2	
Tobacco stalks.....	42.1	1.7	.4	2.7	—	—	—	—	—	
Tobacco stalks, weathered.....	7.6	1.3	.7	2.3	—	—	—	—	—	
Vanilla bean, extracted.....	7.3	.9	.2	.9	1.4	1.4	.2	88.9	—	
Seaweeds										
Broad-leaf kelp (<i>Laminaria digitata</i>).....	87.5	.2	.1	.3	.4	.4	.2	—	.1	
Eel grass.....	35.4	.8	.3	.9	2.1	2.1	.2	—	1.1	
Eel grass wrack (<i>Loxera marina</i>).....	81.2	.3	.1	.3	.5	.5	.3	—	.1	
Irish or carragen moss (<i>Chondrus crispus</i>).....	76.1	.6	.1	1.0	.5	.5	.3	—	.1	
Kelp or ribbon weed (<i>Laminaria saccharina</i>).....	81.5	.3	.1	.3	.4	.4	.2	—	3.7	
Rockweed, green.....	68.5	.6	—	—	—	—	—	—	—	
Rockweed, dried.....	14.4	1.0	1.0	2.8	4.9	4.9	1.0	—	—	

Miscellaneous Materials—Concluded

	Water	Nitrogen	Total Phosphoric Acid	Potash	Calcium Oxide	Magnesium Oxide	Organic Matter	Sand
Animal Materials								
(a) Industrial Waste Materials								
Gelatine plant refuse.....	1.9	2.1	4.6	none	8.7	—	37.6	39.5
Glue waste, dried.....	1.3	2.0	23.9	.3	3.0	.3	17.5	24.0
Glue waste, wet.....	73.4	.6	6.4	.1	.8	.1	4.7	6.5
Press cake from wool mill.....	1.1	3.3	6.2	.3	—	—	—	—
Residue from fish oil clarified with lime.....	6.6	1.4	4.0	.2	28.9	2.0	—	—
Scrapings from raw hides, dried.....	9.2	1.2	.5	.3	13.6	1.2	—	—
Silk mill waste.....	5.4	12.1	—	—	—	—	—	—
Silk worm chrysalis.....	5.4	9.5	1.4	.6	—	—	90.7	—
Soap factory waste.....	52.0	.3	.5	none	—	—	29.8	—
Tannery waste, semi-dry settlings from beam house effluent.....	9.8	3.0	.4	none	18.9	—	—	—
Wool dustings.....	4.6	6.3	.5	.3	—	—	—	—
Woolen textile single dust.....	6.2	8.2	.1	.4	—	—	—	—
Wool washing residue.....	40.0	.4	.4	.5	—	—	—	—
(b) Manures								
Cow.....	87.0	.6	.3	.5	—	—	—	—
Goat, dried.....	10.9	1.3	1.1	3.2	—	—	—	—
Goose.....	58.0	.7	.7	.7	—	—	—	—
Guinea pig, dried.....	8.4	1.7	.6	1.7	—	—	—	—
Hen.....	73.6	1.3	1.0	.5	—	—	—	—
Horse.....	52.9	.7	.6	1.4	—	—	—	—
Pig.....	84.0	.5	.4	.5	—	—	—	—
Pigeon.....	22.2	4.2	2.2	1.4	—	—	—	—
Rabbit.....	55.1	.8	.4	1.1	—	—	—	—
Sheep.....	44.7	1.1	.9	.8	—	—	—	—
Turkey.....	62.0	2.0	1.4	.6	—	—	—	—
(c) Sewage Sludge								
Indian Orchard, processed.....	5.9	1.3	1.0	none	—	.7	36.9	57.2
Worcester.....	17.2	2.1	.7	.2	1.1	.5	34.2	33.0
Worcester, second settling tank.....	15.3	2.3	5.1	.2	.1	.2	34.8	18.2
Nut Island.....	5.3	3.5	1.3	.2	2.1	.7	75.3	11.7
Deer Island.....	3.9	3.4	1.2	.4	2.8	1.7	61.4	13.7
Framingham.....	2.4	2.8	1.4	.1	1.8	.6	52.4	.3
Brockton, not activated.....	12.0	4.3	.8	.1	—	—	—	—
Springfield, main plant.....	3.5	1.6	1.9	.3	—	—	—	—

AGRICULTURAL LIME PRODUCTS

Manufacturers and Brands

During 1946, 13 firms registered for sale in Massachusetts 24 brands of lime products, manufactured and sold for neutralizing acid soils. The products are grouped as follows:

Hydrated or slaked lime	15
Pulverized and ground limestone	9
	<hr/>
	24

The analytical results which appear in this bulletin represent officially drawn samples secured by the same sampling agents who drew the samples of commercial fertilizer which served for the inspection of that commodity; the samples therefore came from every section of the state and are, we believe, representative of the lime products sold in Massachusetts as soil amendments.

We were not successful in securing samples of the following brands:

Brewer & Co., Inc., 45 Arctic St., Worcester, Mass.

Green Mountain Handy Hydrate
Snow Fluff Agricultural Hydrate
Sure Crop Agricultural Lime Hydrate

Eastern States Farmers' Exchange, West Springfield, Mass.

Agricultural Hydrated Lime

Clifford L. Miller, West Stockbridge, Mass.

Monarque Pulverized Limestone

D. U. Smith & Bro., Ashley Falls, Mass.

Ashley White Agricultural Limestone Dolomite

Explanation of Table of Analyses

Tables I, II, III, "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "per cent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "per cent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical analysis" the figures represent in round numbers the percentage of product that would pass or be retained by the meshed sieves mentioned.

The limestone products have been published in two groups or grades (see tables II and III) according to fineness of grinding and to conform to definitions voted by the Association of Official Agricultural Chemists at their 1936 meeting.

Table I. Hydrated or Slaked Lime

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	
Gibsonburg Lime Products Co., Gibsonburg, Ohio							
Gibsonburg Fertlime Hydrated Lime	44.8	46.2	31.3	31.5	85.4	1708	.4
A. H. Hoffman, Inc., Landisville, Penn.							
Hoffman Hydrated Lime	64.9	70.0	2.8	1.0	66.2	1324	1.0
Kelley Island Lime & Transport Co., Cleveland, Ohio							
Tiger All Purpose Hydrated Lime	48.4	47.12	33.9	34.14	90.6	1812	.2
Lee Lime Corporation, Lee, Mass.							
Lee Double Strength Agricultural Hydrated Lime	48.1	46.0	33.6	31.0	91.5	1830	.8
Lee Double Strength Agricultural Hydrated Lime	48.2	46.0	34.0	31.0	93.9	1878	.8
Tobey Agra Hydrate	40.1	35.0	26.1	25.0	75.7	1514	1.9
Limestone Products Corporation of America, Newton, N. J.							
Lime Crest Brand of Calcite Hydrated	68.9	70.0	3.6	1.0	72.1	1442	2.1
New England Lime Co., Adams, Mass.							
Netco Agricultural Hydrated Lime (Adams)	70.7	70.0	3.2	5	73.7	1474	.9
Netco Agricultural Hydrated Lime (Canaan, Conn.)	47.0	47.0	32.5	31.0	88.7	1774	1.8
Netco Land Lime (Canaan, Conn.)	39.5	35.0	29.5	25.0	79.3	1586	1.5
Netco Land Lime (Canaan, Conn.)	44.0	35.0	30.4	25.0	83.0	1660	1.3
United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.							
Red Top Hydrate Lime (Farnams)	64.4	70.0	1.9	trace	65.6	1312	.6
USG Hydrate Lime—Agricultural (Farnams)	72.8	70.0	1.0	trace	72.8	1456	.4
USG Hydrate Lime—Agricultural (Farnams)	72.7	70.0	1.0	trace	72.2	1444	.4

Table II. Pulverized Limestone (Fine-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Lee Lime Corporation, Lee, Mass.									
Lee Pulverized Limestone	31.6	30.0	2.2	20.0	59.8	1196	55	75.57	1.54
Tobey Pulverized Limestone	43.0	35.0	8.8	7.0	53.3	1066	6.80	89.35	none
Limestone Products Corporation of America, Newton, N. J.									
Lucas Crest Brand of Calcite Pulverized	43.3	42.0	8.3	2.0	52.1	1042	8.10	83.06	.39
Lime Crest Brand of Calcite Pulverized	43.0	42.0	4.6	2.0	46.6	932	17.25	77.11	3.24
New England Lime Co., Adams, Mass.									
Nelco Agricultural Ground Limestone (Canaan, Conn.)	32.3	30.0	22.3	21.0	60.4	1208	1.95	77.21	.47
United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.									
USG Agricultural Limestone (Farnams)	55.4	50.5	1.2	.25	55.9	1148	2.65	79.90	.13
USG Agricultural Limestone (Farnams)	51.9	50.5	2.5	.25	53.6	1072	6.25	84.07	.01

Table III. Ground Limestone (Coarse-Ground Limestone)

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Allied Minerals, Inc., Adams, Mass.									
Hoosac Agricultural Limestone	51.4	51.5	1.8	.5	53.9	1078	4.15	61.76	1.24
Hoosac Agricultural Limestone	51.0	51.5	1.0	.5	51.8	1036	7.75	60.90	.65
Conklin Limestone Co., Inc., Canaan, Conn.									
High Magnesium Agricultural Ground Limestone	27.8	30.0	19.2	20.0	52.2	1044	12.00	51.85	none
Lee Lime Corporation, Lee, Mass.									
Lee Pulverized Limestone	30.6	30.0	22.2	20.0	59.1	1182	1.40	50.39	.18

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1946**

Acme Guano Co., 411 National Marine Bank Bldg., Baltimore 2, Md.
 Agricultural Laboratories, Inc., 1145 Chesapeake Ave., Columbus, Ohio
 Allied Chemical & Dye Corporation, The Barrett Division, 40 Rector St., New York 6, N. Y.
 American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St. at St. Clair, Marietta, Ohio
 American Potash & Chemical Corporation, 122 East 42nd St., New York 17, N. Y.
 Apothecaries Hall Co., Waterbury 88, Conn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., 601 Trust Company of Georgia Bldg., Atlanta, Ga.
 Atkins & Durbrow, Inc., 165 John St., New York 7, N. Y.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Berkshire Chemical Co., 92 Howard St., Bridgeport 5, Conn.
 Joseph Breck & Sons Corporation, 85 State St., Boston 9, Mass.
 Buell Fertilizer Co., Exeter, N. H.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Chemical Industries, Inc., 630 Fifth Ave., New York 20, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Davey Tree Expert Co., Kent, Ohio
 Davison Chemical Corporation, 20 Hopkins Place, Baltimore, Md.
 Doggett-Pteil Co., 642 Morris Turnpike, Springfield, N. J.
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.
 Eastern States Farmers' Exchange, 95 Elm St., West Springfield, Mass.
 Essex County Co-operative Farming Association, South Main St., Topsfield, Mass.
 Excell Laboratories, 2623 Indiana Ave., Chicago, Ill.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Ford Motor Co., 300 Schaefer Road, Dearborn, Mich
 Frost & Higgins Co., 20 Mill St., Arlington, Mass.
 Glendale Poultry Farms, Somerset, Mass.
 Goulard & Olena, Inc., Skillman, N. J.
 Grasalo Co., Wilmington, Mass.
 A. H. Hoffman, Inc., Landisville, Penn.
 Hydroponic Chemical Co., Inc., 315 West 39th St., New York 18, N. Y.
 Hy-Trous Corporation, 131 State St., Boston, Mass.
 International Minerals & Chemical Corporation, Woburn, Mass.
 McCormick & Co., Inc., 414 Light St., Baltimore 2, Md.
 Miller Chemical & Fertilizer Corporation, 1060 S. Caroline St., Baltimore, Md.
 Mr. O's Products, Los Angeles 15, Cal.
 Norwood Brand Fertilizer Co., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 F. G. Phillips Co., 255 Cedar St., Dedham, Mass.
 Plantabbs Co., 1 W. Biddle St., Baltimore 1, Md.
 Plantspur Products Co., 1072 West Side Ave., Jersey City, N. J.
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago 9, Ill.
 Ralston Purina Co., Product Control Dept., St. Louis, Mo.
 Ra-Pid-Gro Corporation, Dansville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
 Roger and Hubbard Co., Portland, Conn.
 William R. Rorer, Inc., Drexel Bldg., Independence Square, Philadelphia, Penn.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck & Co., 925 S. Homan Ave., Chicago 7, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
 M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave., & Venango St., Philadelphia, Penn.
 Smith Agricultural Chemical Co., 619 N. Champion Ave., Columbus, Ohio
 Standard Wholesale Phosphate & Acid Works, Inc., 1800 Mercantile Trust Bldg., Baltimore 2, Md.
 Stockdale Fertilizer Co., Morris, Ill.
 Swift & Co., Plant Food Division, 303 Court Square Bldg., Baltimore 2, Md.
 Tennessee Corporation, Lockland, Cincinnati 15, Ohio
 Universal Chemical Co., 195 Ontario St., Lynn, Mass.
 Walker-Gordon Laboratory Co., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro, Mass.
 Woodruff Fertilizer Works, Inc., North Haven, Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 131

DECEMBER, 1946

Seed Inspection

By F. A. McLaughlin

This report, the nineteenth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1946, by authority of Chapter 94 as amended by Chapter 288 of the Acts of 1937 and Chapter 363 of the Acts of 1938.

MASSACHUSETTS STATE COLLEGE

AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any person residing or doing business in the Commonwealth.

Units are rated as follows:	Units
Purity analysis (red clover, timothy, etc.).....	1
Purity analysis (bluegrass, orchard grass, etc.).....	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture).....	4-10
Examination for noxious weeds (sample of 4 oz. or less).....	2
Identification of seed or plant.....	1
Cleaning tobacco seed (4 oz. or less).....	2
Germination test (3 x 100 seeds of any seed not chaffy or requiring purity analysis).....	1
Germination test (soil, 2 x 100 seeds).....	1
Germination test (chaffy grasses or seeds requiring purity analysis)	2

Fees for work in excess of the ten free units allowed to any person residing or doing business in the Commonwealth.

Germination test of all crop seeds except grasses.....	\$0.25
Germination test of timothy.....	.25
Germination test of all other grasses.....	.50
Purity analysis of cereals.....	.50
Purity analysis of timothy.....	.75
Purity analysis of all other grasses.....	1.00
Purity analysis of all other crop seeds.....	.75
Purity analysis of mixtures of not more than 2 kinds of agricultural seeds.....	1.00
Purity analysis of special mixtures, including lawn grasses and pasture mixtures — a charge sufficient to cover the actual cost of working the sample, depending entirely upon the character of the sample.	
Minimum charge.....	1.25

In no case will the final report be rendered until all fees are paid.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any one kind to be submitted for a germination test is 400.

SEED INSPECTION

By F. A. McLaughlin¹

NEW AGRICULTURAL, VEGETABLE, AND FLOWER SEED LAW

The Massachusetts Agricultural, Vegetable and Flower Seed Law was amended at the 1946 session of the Legislature, approved by Governor Tobin on May 24, and became effective on August 24, 1946. The law as amended follows very closely the Uniform Seed Law which has been adopted by many of the states. Copies of the complete Act may be obtained on application to the Commissioner of Agriculture, Department of Agriculture, State House, Boston, Massachusetts. Every seedsman and dealer in seeds is strongly advised to become familiar with the full text of this law, since the following outline is only a brief presentation of requirements affecting the sale of seeds.

Label Requirements

For Agricultural Seeds

1. Commonly accepted name and variety. For Barley, Buckwheat, Oats, Rye and Wheat, when the variety is unknown the label shall bear the statement: "Variety Unknown".
2. Lot number or other identification.
3. Percentage of pure seed.
4. Percentage of inert matter.
5. Percentage of weed seeds.
6. Percentage of other agricultural seeds.
7. Percentage of: (a) germination, exclusive of hard seeds; (b) hard seeds, if present. If (a) and (b) have been stated they may be followed by the total germination and hard seeds if so desired.
8. Month and year germination test was completed. The date of test shall not be over nine months old, exclusive of the month in which the test was completed.
9. Origin of Alfalfa, Red Clover and Field Corn (except Hybrid). If origin is unknown, it must be so stated.
10. Name and address of the person who labeled the seed, or who sells, offers, or exposes such seed for sale.
11. Names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams, and 1 in 10 grams of the smaller seeds, and 1 in 25 grams and 1 in 100 grams of the larger seeds.

For Mixtures of Agricultural Seeds

When several kinds of seeds, each in excess of five percent of the whole are mixed, the word "mixture" or the word "mixed" shall be shown conspicuously on the label. Each component must also be named in the order of its predominance. Otherwise requirements are the same as for Agricultural Seeds except in addition, information 1, 3 and 7 shall be given for each component.

¹Assisted by Miss Jessie L. Anderson, Research Assistant; Mrs. Phyllis Russell, Laboratory Assistant from March to June, 1946; and Miss May J. Honnay, Clerk.

For Vegetable Seeds

1. Kind of seed and variety.
2. For seeds which germinate less than the standard last adopted by the Director of the Massachusetts Agricultural Experiment Station:
 - (a) Percentage of germination exclusive of hard seeds.
 - (b) Percentage of hard seeds, if present.
 - (c) Calendar month and year the test was completed. Date of test shall not be over nine months old, exclusive of the month in which the test was completed.
 - (d) The words "below standard" in not less than 8 point type.
3. Name and address of the person who labeled such seed, or who sells, offers, or exposes it for sale.

For Flower Seeds

1. Kind of seed and variety.
2. Name and address of the person who labeled such seed or who sells, offers or exposes it for sale.

Seed Prohibited From Sale

1. Unless the test for germination has been completed within a nine month period, exclusive of the month in which the test was completed.
2. Containing primary noxious weed seeds in excess of tolerance.
3. Not labeled in accordance with the provisions of the Act or having a false or misleading label.
4. Pertaining to which there has been a false or misleading advertisement.

Noxious Weed Seeds

Primary are: Canada thistle (*Cirsium arvense*), field bind-weed (*Convolvulus arvensis*) and quack grass (*Agropyron repens*).

Secondary are: Dodder (*Cuscuta* spp.), horse nettle (*Solanum carolinense*), wild mustards (*Brassica* spp.), wild garlic and wild onion (*Allium* spp.), perennial sow thistle (*Senchus arvensis*), corn cockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*).

Massachusetts Vegetable Seed Standards for 1947

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>) ..	60	Kale.....	75
Asparagus.....	*70	Kohlrabi.....	75
Bean, Lima.....	70	Leek.....	60
Bean, Scarlet Runner.....	75	Lettuce.....	80
Bean, Other Varieties.....	75	Muskmelon.....	75
Beet.....	65	Mustard.....	75
Broccoli.....	75	Okra.....	*50
Brussels Sprouts.....	70	Onion.....	70
Cabbage.....	75	Parsley.....	60
Cabbage, Chinese.....	75	Parsnip.....	60
Carrot.....	55	Peas.....	80
Cauliflower.....	75	Pepper.....	55
Celeriac.....	55	Pumpkin.....	75
Celery.....	55	Radish.....	75
Chard, Swiss.....	65	Rhubarb.....	60
Chicory.....	65	Rutabaga.....	75
Citron.....	65	Salsify.....	75
Collard.....	80	Sorrel.....	60
Corn, Sweet.....	75	Soybean.....	75
Cress, Garden or Curle ¹	40	Spinach, Common.....	60
Cress, Water.....	35	Spinach, New Zealand.....	40
Cucumber.....	80	Squash.....	75
Dandelion.....	45	Tomato.....	75
Egg Plant.....	60	Tomato, Husk.....	50
Endive.....	70	Turnip.....	80
Fetticus (Corn Salad).....	70	Watermelon.....	70

¹Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds and the percentage of hard seed, if present, must be stated.

Rules and Regulations

1. Sampling, inspecting, analyses, tests, tolerances and examinations of agricultural, vegetable and flower seeds will be in accordance with the rules, regulations and procedures of the Association of Official Seed Analysts.

2. Black medick or yellow trefoil (*Medicago lupulina*) and suckling clover (*Trifolium dubium*) are classified as weeds in Massachusetts and may not be included with other crop seeds in any analysis.

3. Section 261 B-1. In the case of barley, buckwheat, oats, rye or wheat, when the variety thereof is unknown, the label or tag shall have printed thereon the words "Variety Unknown". The word "Type" may be used only when it is preceded by the words "Variety Unknown".

1946 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1945, to November 1, 1946, the Seed Laboratory received 5384 samples of seed, of which 1143 were collected by the State Department of Agriculture and 4241 were sent in by seedsmen, farmers and various state institutions. An additional lot of 226 samples of flower seeds, for field tests only was received from the State Commissioner of Agriculture.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 5384 samples was 6063; 345 for purity and 5718 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
261 Field Crops for Purity and Germination.....	261	261
361 Field Crops for Germination Only.....	.....	361
4 Field Crops for Purity Only.....	4	.....
38 Lawn Mixtures for Germination Only, Germinations involving 169 ingredients.....	.....	169
62 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 287 ingredients	62	287
18 Lawn Mixtures for Purity Only.....	18	.....
4511 Vegetables for Germination Only.....	.....	4511
8 Tree Seeds for Germination Only.....	.....	8
89 Tobacco Seeds for Germination Only.....	.....	89
32 Flower Seeds for Germination Only.....	.....	32
<hr/> 5384	<hr/> 345	<hr/> 5718

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested 468 samples of vegetable seeds and 226 samples of flower seeds, respectively.

The Seed Laboratory cleaned 74 lots of tobacco seed and 23 lots of onion seed for Connecticut Valley farmers. The gross weight of the tobacco seed was 104.31 pounds and the net weight for the cleaned seed was 80.59 pounds. Onion seed received had a gross weight of 1316.25 pounds which was cleaned to a net weight of 346.95.

Explanation of Tables

Each of the following tables contains seeds, the sale of which is regulated by a definite section of the Massachusetts Seed Law. The samples were taken by an inspector from the State Department of Agriculture and worked at the Seed Laboratory. Section 261A of the Acts and Resolves of 1937 and 1938, Chapters 288 and 363, defines the group from Alfalfa to Wheat, inclusive; Section 261B, Mixtures; Section 261C, Special Mixtures; and Section 261D, Vegetables.

The last table is a summary, by wholesalers, of the total number of samples tested under each of the above four sections and the number of samples found to be mislabeled.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement.

Mislabeled and other irregularities are emphasized in the tables by boldface type and explained in the final column of the table or in footnotes.

The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

All lots of seed included in this report were tested according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

“Tolerance” is applied to both purity and germination. “Germination Tolerance” has been applied between a given germination and the result of the germination test as follows:

GIVEN GERMINATION PERCENT	TOLERANCE PERCENT
96 or over.....	5
90 or over, but less than 96.....	6
80 or over, but less than 90.....	7
70 or over, but less than 80.....	8
60 or over, but less than 70.....	9
Less than 60.....	10

In the determination of the tolerance for the percentage of the distinguishable kind, type, or variety (pure seed), weed seeds, other crops seed, and inert matter, the sample shall be first considered as made up of two parts: (a) The percentage of the component (pure seed, weed seed, crop seed or inert matter as the case may be) being considered, and (b) the difference between that percentage and 100. The number represented by (a) is then multiplied by the number represented by (b) and the product is divided by 100. The resulting number is then multiplied by 0.2 (2/10) and the resulting product added to 0.2 or 0.6 as indicated in the following formulae:

$$\text{Pure seed tolerance} = 0.6 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

$$\begin{array}{l} \text{Weed seeds, other crop seeds, and} \\ \text{inert matter tolerance} \end{array} = 0.2 + \left\{ 0.2 \times \frac{a \times b}{100} \right\}$$

For *Poa* spp., *Agrostis* spp., *Festuca* spp., bromegrass, crested wheatgrass, orchard grass, velvet grass, tall oatgrass, meadow foxtail, sweet vernalgrass, Rhodes grass, Dallis grass, carpet grass, and Bermuda grass, and mixtures containing these seeds singly or combined in excess of 50 percent, an additional tolerance shall be allowed. This is to be obtained by adding to the regular tolerance mentioned above the product obtained by multiplying the regular tolerance by the lesser of “a” and “b” divided by 100.

Results of Inspection and Analyses of Field Seeds — Section 261A

Each lot of Agricultural Seeds must be labeled to show the name and variety; approximate percentage, by weight, of purity; approximate total percentage, by weight, of weed seeds; name and approximate number per ounce of each kind of noxious weed seeds present, singly or collectively, as follows: (1) in excess of one seed in each five grams of grasses, alfalfa and clovers; (2) in excess of one seed in each twenty-five grams of millets, rape and other seeds of similar size; (3) in excess of one seed in each hundred grams of wheat, oats, rye, and other seeds as large or larger than wheat; the approximate percentage of germination of such agricultural seed, and the month and year such seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

One hundred and eighty-three samples of field crop seeds were sampled and analyzed in the laboratory. Results of analyses, however, are given only for samples which were mislabeled. In this table complete analysis is recorded, but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination Date	Date of Test	Violations
1072	Timothy	Apothecaries Hall Co., Waterbury, Conn. Knight Grain Co., Newburyport No. 10-658.....	L 99.60 F 99.04	0.20 0.78	0.15 0.14	0.05 0.04	90.00 92.00	4 1946 7 1946	Weed seed excessive.
679	Clover	Arthur R. Cone, Buffalo, N. Y. Essex County Co-operative Farming Assn., Topsfield Medium Red, No. 15 x 597.....	L 99.00 F 99.33	0.80 0.40	0.10 0.13	0.10 0.14	* 84-9	2 1946 6 1946	*Required information not given.
292	Clover	Farm Service Co., Attleboro Red, No. 15 x 598.....	L 98.95 F 98.88	0.30 0.51	0.35 0.21	0.40 0.15	* 85-11	2/1946 6/1935	*Required information not given.
300	Corn	**Ensilage, No. 80-93.....	L 99.50 F 99.90	— —	0.50 0.10	— —	90.00 80.00	3/1946 5/1946	**Variety required; "Ensilage" is not a variety. Germination below that stated.
296	Millet	Japanese, No. 90-34.....	L 99.00 F 98.20	0.78 1.55	0.22 0.25	— —	82.00 78.00	11/1945 6/1946	Weed seed excessive.

299	Vetch	Winter, No. 70-12.....	L 98.84 F 99.49	0.31 0.33	0.80 0.18	0.05	82.5 70-13	12/1945 7/1946	Germination below that stated.
1077	Clover	Farmers' Feed & Supply Co., Amesbury Medium Red, No. 15 x 594.....	L 99.00 F 98.47	0.27 0.36	0.10 0.11	0.63 1.06	72-20 86-8	1/1946 7/1946	Noxious weeds not declared; but 18 English Plantain and 7 Dodder per oz. found.
1050	Corn	Westbranch Sweepstakes, No. 80 x 109.....	L 99.50 F 99.78	—	0.50 0.22	—	88.00 76.00	3 1946 6 1946	Germination below that stated.
952	Corn	Sunshine Feed Store, Greenfield **Ensilage.....	L 99.50 F 99.86	—	0.50 0.16	—	* 87.00	1 1946 6 1946	*Required information not given. **Variety required; "Ensilage" is not a variety.
1115	Reed Canary Grass	Eastern States Farmers' Exchange, Springfield, Mass. Eastern States Farmers' Exchange, Waltham No. R-1198.....	L 99.55 F 97.18	0.10	0.25 2.82	0.10	80.00 69.00	12 1945 6/1946	Purity and germination below that stated.
472	Mangel	Charles C. Hart Seed Co., Wethersfield, Conn. Sturgis Hardware Store, Middleboro Giant Long Red.....	L * F 99.40	—	—	—	73.00 70.00	1 1946 5 1946	*Required information not given.
1085	Millet	D. Landreth Seed Co., Bristol, Pa. Coulton Donnelly Co., Attleboro Japanese, No. BC 500.....	L 98.75 F 98.52	0.35 1.20	0.90 0.28	—	85.00 86.00	1 1946 7 1946	Weed seed excessive.
S-208	Ryegrass	Medfield State Hospital, Medfield Domestic, No. BC 650.....	L 99.40 F 99.38	0.13 0.16	0.35 0.36	0.12 0.10	90.00 72.60	1 1946 6 1946	Germination below that stated.
1133	Clover	John D. Lyon, Inc., Belmont, Mass. F. Diehl & Sons, Inc., Wellesley Ladino.....	L 99.23 F 99.33	0.21 0.39	0.32 0.14	0.24 0.14	94.00 76-22	1 1946 7/1946	Noxious weeds not declared; but 15 English Plantain per oz. found. Germination below that stated.
1118	Clover	White Dutch.....	L 98.60 F 97.23	0.10 1.56	0.10 0.09	1.20 1.12	89.00 82.5	1 1946 7/1946	Purity below that stated. Weed seed excessive.

Results of Inspection and Analyses of Field Seeds — Section 261A—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed	Weed Seed	Inert Matter	Other Crop Seed	Germination Date	Date of Test	Violations
508	Clover	Ostberg Seed Co., Chicago, Ill. Sears, Roebuck & Co., Brockton White, No. OWC 77.....	L 96.50 F 94.20	0.50 1.71	0.25 0.42	2.75 3.67	72-20 67-30	1 1946 6 1946	Purity below that stated, Weed seed excessive.
142	Bluegrass	Sears, Roebuck & Co., Quincy Kentucky, No. OK 255.....	L 85.00 F 85.09	0.40 0.37	14.60 14.49	— 0.05	80.00 56.00	1 1946 6 1946	Germination below that stated.
1127	Corn	The Page Seed Co., Greene, N. Y. Weld & Beck, Southbridge Page's Lancaster Sure Crop, No. 6043.....	L 98.00 F 99.23	—	2.00 0.77	—	90.00 80.00	3 1946 6 1946	Germination below that stated.
1128	Millet	Hungarian, No. J 6-N 46.....	L 98.05 F 93.83	1.25 5.89	0.45 0.27	0.25 —	App. 85.00 89.00	3 1946 7 1946	Purity below that stated, Weed seed excessive.
1053	Alfalfa	Wm. C. Scarlett & Co., Baltimore, Md. C. P. Washburn Co., Middleboro Argentine, No. 28361.....	L 99.30 F 99.03	0.20 0.49	0.50 0.36	— 0.12	90.00 71-6	3 1946 7 1946	Germination below that stated.
1047	Bluegrass	Stanford Seed Co., Buffalo, N. Y. Cutler Grain Co., Framingham Kentucky, No. 4351.....	L 89.30 F 83.96	0.20 0.25	10.50 15.79	—	84.00 81.00	1 1946 6 1946	Purity below that stated.
1042	Clover	Alsike, No. 6323.....	L 98.50 F 98.38	0.25 0.98	0.25 0.18	1.00 0.46	80-10 84-6	1 1946 7 1946	Weed seed excessive.
1043	Clover	Medium Red, No. 6355.....	L 99.25 F 98.89	0.25 0.30	0.15 0.36	0.35 0.45	80-10 85-5	1 1946 7 1946	Noxious weeds not declared, but 14 English Plantain per oz. found.
1022	Alfalfa	Clarence J. Howland, North Brookfield Common, No. 4801.....	L 99.56 F 99.65	0.14 0.08	0.02 0.06	0.28 0.21	70-5 41-24	4 1946 7 1946	Germination below that stated.

1024	Redtop	No. 4233	L 93.65 F 91.94	0.12 0.79	6.23 7.22	— 0.05	90.00 91.00	3 1946 6 1946	Weed seed excessive.
716	Timothy	Whitney Seed Co., Buffalo, N. Y. Amherst Farmers' Supply Co., Amherst No. 12-28	L 99.60 F 99.43	0.05 0.14	0.25 0.21	0.10 0.32	96.00 95.00	3 1946 6 1946	Noxious weeds not declared but 28 English Plantain per oz. found.
1098	Clover	Farm Bureau Association, Waltham Alsike, No. 1571	L 98.89 F 98.85	0.48 0.40	0.47 0.71	0.16 0.04	78-16 70-21	3 1946 7 1946	Noxious weeds not declared, but 16 English Plantain per oz. found.
1101	Orchard Grass	No. 3157	L 89.77 F 85.31	0.35 0.29	8.93 13.14	0.95 1.26	88.00 92.00	3 1946 6 1946	Purity below that stated.
1037	Bluegrass	Farmers' Cooperative Exchange, Inc., Fraumingham Kentucky, No. 36-58	L 87.70 F 83.06	0.50 0.17	11.80 16.77	— —	80.00 77.00	3 1946 6 1946	Purity below that stated.
1040	Buckwheat	*No. 8102	L 99.43 F 99.24	0.02 0.02	0.46 0.48	0.09 0.26	88.00 88.00	2 1946 7 1946	*Variety required but not stated.
1031	Timothy	No. 12-28	L 99.60 F 97.85	0.05 0.93	0.25 0.20	0.10 1.02	96.00 87.00	3 1946 6 1946	12 English Plantain per oz. declared but 248 English Plantain per oz. found. Purity and Germination below that stated. Weed Seed excessive.
1093	Soy Beans	Frank P. Mills, Campello Manchu, No. 66114	L 99.00 F 99.57	— —	1.00 0.23	— 0.20	85.00 74.00	2 1946 6 1946	Germination below that stated.
1038	Bluegrass	S. D. Woodruff & Sons, Orange, Conn. Farmers' Cooperative Exchange, Inc., Framingham Kentucky	L 85.50 F 78.61	0.35 0.98	14.15 20.41	— —	78.00 77.00	11 1945 6 1946	Purity below that stated. Weed seed excessive.
S-225	Meadow Grass	Massachusetts Reformatory, West Concord Rough Stalk, No. 4547	L 99.70 F 98.88	0.20 0.10	0.08 0.99	0.02 0.03	90.00 96.00	1 1946 6 1946	Labeled "Rough Stalk Meadow Grass"; but found to be Meadow Fescue.
S-162	Meadow Grass	Worcester State Hospital, Worcester Rough Stalk, No. 4563	L 99.31 F 99.50	0.08 0.20	0.61 0.30	— —	90.00 96.00	1 1946 4 1946	Labeled "Rough Stalk Meadow Grass"; but found to be Meadow Fescue.

Results of Inspection and Analyses of Mixtures — Section 261B

Each Mixture of Agricultural Seeds which contains not more than two kinds, each of which is present in excess of five percent by weight, must be labeled to show that such seed is a mixture; the name, variety and approximate percentage by weight of each kind present in excess of five percent by weight of the total mixture; approximate total percentage by weight of weed seeds; name and approximate number per ounce of noxious weed seeds present singly or collectively in excess of one seed in each fifteen grams of such mixture; the approximate percentage of germination of each kind of agricultural seed present in excess of five percent by weight, together with the month and year such seed was tested; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard species (*Brassica* spp.), and English plantain (*Plantago lanceolata*).

Complete analysis is given, but mislabeling, which is indicated by boldface type, is applied only to the items named above.

The name and address of the wholesaler are printed in boldface type.

Two samples only were received under this section.

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
1060	Wm. G. Scartlett & Co., Baltimore, Md. C. P. Washburn Co., Middleboro Alsike and White Clover Mixture, No. 9188.....					L	0.20	0.30	3.00	3/1946	
						F	0.17	0.06	3.15	6/1946	
	Ingredients:										Germination below that stated.
	White Clover.....	21.50	23.60	85.00	71-25						
	Alsike Clover.....	75.00	72.02	85.00	83-16						
1020	Stanford Seed Co., Buffalo, N. Y. Clarence J. Howland, No. Brookfield Alsike and White Clover Mixture, No. 4670.....					L	1.00	0.28	2.85	4/1946	
						F	3.88	0.48	0.41	6/1946	Weed seed excessive.
	Ingredients:										
	White Clover.....	18.60	19.24	76-14	80-16						
	Alsike Clover.....	77.27	75.99	78-12	70-28						

Results of Inspection and Analyses of Mixtures — Section 261C

Each Mixture of Agricultural Seeds, except as specified in Section 261B, shall be labeled to show that such seed is a mixture; the name, variety and approximate percentage by weight of each kind present in excess of five percent or more by weight of the total mixture; approximate total percentage by weight of weed seeds; the approximate percentage of germination of each kind present in excess of five percent by weight, together with the month and year said seed was tested; the approximate percentage by weight of inert matter; the name and approximate number per ounce of noxious weed seeds present singly or collectively in excess of one seed in each fifteen grams of such mixture; and the name and address of the vendor. Noxious weeds are quack grass (*Agropyron repens*), Canada thistle (*Cirsium Arvense*), dodder species (*Cuscuta* spp.), wild mustard (*Brassica* spp.) and English plantain (*Plantago lanceolata*).

Complete analysis is given, but mislabeling, which is indicated by boldface type, is applied only to the items named above.

The name and address of the Wholesaler are printed in boldface type.

Thirty-eight mixtures under this section were received, but only twelve, for which analysis does not conform with labeled information, are shown in this table.

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks	
		Label	Found	Label	Found							
750	Arthur R. Cone, Buffalo, N. Y. C. B. Coburn Co., Lowell Concord Mixture, No. AMS 81.....	L F										
		Ingredients:										
		Kentucky Bluegrass.....	3.50	3.42	80.00	87.00	—	0.45	6.38	—	1/1946	Weed seed excessive.
		Redtop.....	7.47	8.39	90.00	91.00					6/1946	
		Timothy.....	56.72	57.58	90.00	85.00						
		White Clover.....	0.98	0.60	70-21	75-24						
		Domestic Ryegrass.....	24.50	26.23	90.00	93.00						
		Farm Service Co., Attleboro										
		Anchor Lawnseed Mixture.....										
		L F										
		Ingredients:										
		Kentucky Bluegrass.....	28.00	25.10	80.00	75.00		0.50	9.56	0.80	1/1946		Germination below that stated.
Redtop.....	30.36	36.36	90.00	92.00		0.31	6.84	3.80	5/1946			
Timothy.....	9.90	8.47	90.00	78.00								
White Clover.....	5.04	5.52	75-20	85-4								
Domestic Ryegrass.....	15.84	13.60	90.00	90.00								
293												

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
707	J. Oliver Johnson & Co., Chicago, Ill. Decatour Hopkins Co., Boston Winner Mixture, No. LA 288					L —	1.00	12.60	0.50	1 1946	
				F 85.24		F 85.24	0.52	13.50	0.74	5 1946	
	Ingredients:										
	Kentucky Bluegrass.....	8.00	9.22	65.00	68.00						Germination below that stated.
	Redtop, Fancy.....	27.90	26.20	90.00	79.00						Germination below that stated.
	Timothy.....	14.85	16.09	80.00	50.00						Germination below that stated.
	Domestic Ryegrass.....	34.65	33.73	90.00	88.00						
662	D. Landreth Seed Co., Bristol, Pa. Western Auto Associate Store, Plymouth Landreth Never Die Mixture, No. 3-H-1					L —	0.69	8.94	1.40	2 1946	
				F 85.36		F 85.36	1.70	12.13	0.81	5 1946	Weed seed and inert matter excessive.
	Ingredients:										
	Kentucky Bluegrass.....	21.25	17.12	80.00	89.00						Germination below that stated.
	Redtop.....	58.41	59.03	88.00	85.00						
	White Dutch Clover.....	4.41	3.31	85-13	79-15						
	Cheerings Fescue.....	4.90	5.90	80.00	50.00						Germination below that stated.
661	Popular Mixture, No. 1-H-1					L —	0.63	14.88	0.80	1 1946	
				F 84.84		F 84.84	0.84	14.10	0.22	4 1946	
	Ingredients:										
	Kentucky Bluegrass.....	9.01	10.77	80.00	74.00						Germination below that stated.
	Redtop.....	22.13	20.42	88.00	88.00						Germination below that stated.
	Timothy.....	29.88	27.76	96.00	70.00						Germination below that stated.
	White Dutch Clover.....	0.88	0.67	85-13	73-20						Germination below that stated.
	Domestic Ryegrass.....	21.79	25.22	90.00	78.00						Germination below that stated.

Oslberg Seed Co., Chicago, Ill.

Sears, Roebuck & Co., Lawrence

Superfine Mixture, No. OD 185.

694

Ingredients:										
Kentucky Bluegrass.....	45.00	41.54	80.00							
Redtop.....	24.50	—	90.00							
Astoria Bent.....	4.90	—	90.00							
Domestic Ryegrass.....	19.80	19.84	90.00	46.00						
Agrostis spp.....	—	31.05	—	93.00						
(Redtop and Astoria Bent)				89.00						
										Germination below that stated.

L	—	0.20	5.60	—	1/1946
F	92.43	0.43	6.85	0.29	5/1946

Sears, Roebuck & Co., Quincy

Garden Master Mixture, No. OD 184.

141

Ingredients:										
Kentucky Bluegrass.....	29.75	28.56	80.00							
Redtop.....	18.00	18.84	90.00	56.00						
Chewings Fescue.....	24.50	22.47	80.00	88.00						
Domestic Ryegrass.....	14.70	17.98	90.00	62.00						
Meadow Fescue.....	4.90	4.66	80.00	92.00						
				78.00						Germination below that stated.

L	—	0.50	6.65	1.00	1/1946
F	92.51	0.74	6.28	0.47	5/1946

139 Green Carpet Mixture, No. OD 167.

Ingredients:

Kentucky Bluegrass.....

Redtop.....

Domestic Ryegrass.....

Robin Hood Park Blend Mixture, No. OD 173.

140

Ingredients:

Kentucky Bluegrass.....

Redtop.....

White Clover.....

Domestic Ryegrass.....

L	—	1.00	6.52	—	1/1946
F	91.04	0.24	8.64	0.08	5/1946

	20.40	21.21	70.00	39.00	
	27.00	25.37	85.00	74.00	
	45.00	44.45	90.00	90.00	

L	—	0.50	7.98	1.00	1/1946
F	93.30	0.29	6.27	0.14	5/1946

	34.00	31.53	80.00	45.00	
	25.20	25.20	90.00	91.00	
	1.92	3.60	85.00	76-20	
	29.40	32.97	90.00	92.00	

L	—	1.00	7.98	1.00	1/1946
F	93.30	0.29	6.27	0.14	5/1946

	34.00	31.53	80.00	45.00	
	25.20	25.20	90.00	91.00	
	1.92	3.60	85.00	76-20	
	29.40	32.97	90.00	92.00	

	34.00	31.53	80.00	45.00	
	25.20	25.20	90.00	91.00	
	1.92	3.60	85.00	76-20	
	29.40	32.97	90.00	92.00	

	34.00	31.53	80.00	45.00	
	25.20	25.20	90.00	91.00	
	1.92	3.60	85.00	76-20	
	29.40	32.97	90.00	92.00	

Results of Inspection and Analyses of Mixtures — Section 261C—Continued

Lab. No.	Wholesale Distributor, Brand Name and Ingredients of Each Mixture, Dealer, when other than Wholesale Distributor, and Place Collected	Ingredients $\frac{c}{c}$		Germination $\frac{c}{c}$	Pure Seed $\frac{c}{c}$	Weed Seed $\frac{c}{c}$	Inert Matter $\frac{c}{c}$	Other Crop Seed $\frac{c}{c}$	Date of Test	Remarks		
		Label	Found								Label	Found
327	W. M. Scarlett & Co., Baltimore, Md. C. K. Wannamaker, Arlington Heights Park Lawn Seed Mixture, No. 22761	.....		L	—	1.00	14.70	0.30	2/1946	Noxious weeds not declared, but 57 English Plantain per oz. found.		
		.....		F	87.33	0.88	10.77	1.02	4/1946			
		Ingredients:										
		Kentucky Bluegrass.....	12.00	12.17	80.00	—	—	—	—		—	Germination below that stated.
		Redtop.....	27.50	27.57	85.00	—	—	—	—		—	Germination below that stated.
357	The Stanford Seed Co., Buffalo, N. Y. Cutler Grain Co., Framingham Lawn Seed Mixture, No. 5001 A	.....		L	—	0.80	14.42	0.90	3/1946	Germination below that stated.		
		.....		F	85.30	0.60	13.40	0.70	5/1946			
		Ingredients:										
		Kentucky Bluegrass.....	17.22	16.48	80.00	—	—	—	—		—	Germination below that stated.
		Redtop.....	28.00	30.23	85.00	—	—	—	—		—	Germination below that stated.
358	Shady Spot Lawn Seed, No. 5004 A	.....		L	—	0.80	13.36	0.80	3/1946	Germination below that stated.		
		.....		F	84.77	0.46	14.39	0.38	5/1946			
		Ingredients:										
		Kentucky Bluegrass.....	8.45	8.13	80.00	—	—	—	—		—	Germination below that stated.
		Redtop.....	23.34	25.57	85.00	—	—	—	—		—	Germination below that stated.

Results of Inspection and Germination of Vegetable Seeds

Section 261 D

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety; the percentage of germination, with the month and year tested, provided the germination is below the Massachusetts Standard; and the name and address of the vendor, packer, or processor.

Nine hundred and fifty three samples of vegetable seeds were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of the law. Thirty-five samples, not shown in the table, were found to be above standard and thus complied with the law, but were below the germination stated on the label. **All samples shown in the table were below standard in germination.**

The wholesaler's name is in boldface type. "Wholesaler Unknown" is applied to samples of seed which were purchased for a previous season's sale but were offered for sale during the current season without having been retested.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			%	Date of Test	%	Month of Test	
Associated Seed Growers, Inc., New Haven, Conn.							
1063	Onion	Dugan Supply Co., Newburyport Yellow Globe Danvers.....	..	.....	55	6/1946	70
Alfred J. Brown Seed Co., Grand Rapids, Mich.							
488	Lettuce	Alden's Inc., Campello Big Boston.....	..	.....	15	5/1946	80
W. Atlee Burpee Co., Philadelphia, Pa.							
254 F	Beet	Harding Street Grain Store, Worcester Crosby's Egyptian, No. 5910....	70	12/1945	46	5/1946	65
Schofield Hardware Co., No. Attleboro							
223	Parsnip	Long Smooth Hollow Crown, No. 727.....	70	9/1945	13	4/1946	60
Comstock, Ferre & Co., Wethersfield, Conn.							
31	Cucumber	J. W. Gardiner & Sons, Fall River Early Fortune.....	83	12/1945	72	4/1946	80
435F	Corn	H. A. Spear & Son, Inc., Walpole Bantam Evergreen.....	..	.....	34	5/1946	75
Arthur R. Cone, Buffalo, N. Y.							
S-1	Cabbage	Wrentham State School, Wrentham Copenhagen Market.....	90	1/1946	57	4/1946	75
Empire Seed Co., Fredonia, N. Y.							
845	Lettuce	Joseph Niedbala, Hadley Early Curled Simpson.....	..	.....	72	5/1946	80
Essex Co. Cooperative Farming Assoc., Topsfield, Mass.							
673	Parsnip	All American.....	..	.....	10	5/1946	60
Fredonia Seed Co., Fredonia, N. Y.							
963	Cucumber	Frank J. Wells, Charlemont Improved Long Green.....	..	.....	71	6/1946	80
Thomas J. Grey Co., Boston, Mass.							
286F	Turnip	Purple Top Milan.....	..	.....	71	5/1946	80
Charles C. Hart Seed Co., Wethersfield, Conn.							
736	Parsnip	Johnson Farm Supply Co., Reading Hollow Crown.....	70	3/1946	6	5/1946	60
Pierce Hardware Co., Taunton							
8	Broccoli	Early Green Calabrese.....	88	11/1945	43	4/1946	75

Results of Inspection and Germination of Vegetable Seeds
Section 261 D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Budd D. Hawkins, Reading, Vt.							
262	Broccoli	Brockelman's Market, Worcester					
		Italian Green Spouting	75	11/1945	49	5/1946	75
260	Cabbage	True Early Winningstadt	75	11/1945	64	4/1946	75
I. B. Burrows Co., Worcester							
398	Lettuce	May King	80	11/1945	30	4/1946	80
D. Landreth Seed Co., Bristol, Pa.							
664F	Turnip	Barstow's, Marshfield					
		Amber Globe Red Crown, No. 843 C			35	5/1946	80
Massachusetts Reformatory, West Concord							
S 123	Corn	Golden Sunshine, Top Crossed, No. BA 148	90	1/1946	31	4/1946	75
Parker's Farm Supply Co., Wakefield							
739F	Beans	Landreth's Top Notch Golden Wax, No. C 380		1/1946	63.2	5/1946	75
Westboro State Hospital, Westboro							
S 170	Onion	Ebenezer or Japanese	75	1/1946	31	5/1946	70
Yankee Products, Inc., Boston							
767	Onion	Ebenezer	75		4	5/1946	70
Ralston Purina Co., St. Louis, Mo.							
173	Pepper	Checkerboard Feed Store, Taunton World Beater (treated)	65	12/1945	37	4/1946	60
Ross Bros. Co., Worcester, Mass.							
379F	Beans	Fordhook Lima, No. 1213			50	4/1946	70
Joseph Sordillo & Sons, Boston, Mass.							
272	Cabbage	Early Jersey Wakefield			56	4/1946	75
267F	Radish	Black Spanish, Long			52	5/1946	75
Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission)							
349	Onion	Washington School, Taunton Yellow Globe Danvers			52	4/1946	70
F. H. Woodruff & Sons, Milford, Conn.							
552F	Radish	A. J. Desmarais, Fall River Long White			30	5/1946	75
Waldron Hardware Co., Taunton							
355	Peas	Giant Podded Hamper, No. 2-674			47	5/1946	80
S. D. Woodruff & Sons, Orange, Conn.							
240F	Beans	Monroe's Seed Market, Attleboro Dwart Horticultural, No. 2552	85	12/1945	60	4/1946	75
Taunton State Hospital, Taunton							
S 68	Squash	Table Queen or Des Moines, No. 4308	App. 80	12/1945	56	4/1946	75
*Wholesaler Unknown							
Amherst Farmers' Supply Co., Amherst							
712	Cabbage	Danish Ball Head			43	5/1946	75
713F	Corn	Stowell's Evergreen			9	5/1946	75
714	Squash	Blue Hubbard			2	5/1946	75
Belmont Hardware Co., Springfield							
416	Beans	Davis Kidney Wax			0	5/1946	75
417	Parsnip	Hollow Crown			6	4/1946	60
Boston Supply, Inc., Framingham							
361F	Radish	Black Spanish, Round			16	4/1946	75

Results of Inspection and Germination of Vegetable Seeds
Section 261 D—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	%
Wholesaler Unknown—(Continued)							
551	Lettuce	A. J. Desmarais, Fall River Hanson.....	0		5/1946		80
1009	Cabbage	Dresser-Hull Co., Lee Danish Ball Head.....	0		6/1946		75
824F	Radish	E. M. Gulow & Co., Turners Falls Black Spanish, Long.....	42		6/1946		75
810	Celery	Mason's Farm Market, Springfield Queen Winter.....	0		5/1946		55
614F	Beans	Mendelsohn's, Waltham Red Kidney.....	62		5/1946		75
1007	Cucumber	E. A. Noble & Co., Stockbridge Improved Long Green.....	67		6/1946		80
769F	Corn	Raymond's, Inc., Boston Sunshine.....	21		5/1946		75
424	Dandelion	Rocky's Hardware Co., Springfield Fr. Common.....	0		4 1946		45
422	Egg Plant	N. Y. Improved Purple.....	42		4 1946		60
421	Kale	Dwarf Curled.....	58		4, 1946		75
762	Lettuce	Thompson Hardware Co., Lowell Iceberg.....	28		5/1946		80
643F	Turnip	Uxbridge Hardware Co., Uxbridge Ea. Flat Red or Purple Top Strap Leaf.....	49		6/1946		80
605	Lettuce	Weld Square Hardware Co., New Bedford Simpson's Ea. Curled.....	45		5/1946		80
785F	Corn	Frank Whitcomb, Amherst Spancross, No. P-39.....	94	1/1946	6/1946		75

* Wholesaler not named because retailer admits, or wholesaler claims, that the following lots of vegetable seeds were not purchased by the retailer during the current year.

Summary of Inspection

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Apothecaries Hall Co. Waterbury, Conn.				2	1	1			
Associated Seed Growers, Inc. New Haven, Conn.	42	41	1				1	1	0
Aubuchon, A. W. & Co. Fitchburg, Mass.	10	10	0						
Barrett, W. E. & Co. Providence, R. I.	6	6	0						
Boston Market Gardener's Assoc. Waltham, Mass.	2	2	0						
Breck, Joseph, & Sons Boston, Mass.	42	42	0	7	7	0			
Brown, Alfred J., Seed Co. Grand Rapids, Mich.	8	7	1						
Burpee, W. Atlee, Co. Philadelphia, Pa.	26	24	2	1	1	0	1	1	0
Butler Bros. Chicago, Ill.	8	8	0						
Clapper Co., The West Newton, Mass.	8	8	0						
Clark Hardware Co. Greenfield, Mass.	2	2	0						
Comstock, Ferre & Co. Wethersfield, Conn.	62	60	2	2	2	0	1	1	0
Cone, Arthur R. Buffalo, N. Y.	37	36	1	32	24	8	3	1	2
Crosman Seed Corp. East Rochester, N. Y.	15	15	0						
Dickinson, Albert, Co. Chicago, Ill.				1	1	0			
Doughten Seed Co. Jersey City, N. J.							1	1	0
Duryea Seed Co. New York, N. Y.				2	2	0			
Eastern States Farmers' Exchange Springfield, Mass.	21	21	0	11	10	1	2	2	0
*Emerson, Thomas W. Boston, Mass.	2	2	0						
Empire Seed Co. Fredonia, N. Y.	7	6	1						
Essex County Cooperative Farming Assoc. Topsfield, Mass.	12	11	1						
Fredonia Seed Co. Fredonia, N. Y.	8	7	1				1	1	0
Grey, Thomas J., Co. Boston, Mass.	17	16	1						
Hardee Seeds West Medford, Mass.	7	7	0						
Harris, Joseph, & Co. Rochester, N. Y.	12	12	0						
Hart, Charles C., Seed Co. Wethersfield, Conn.	61	59	2	3	2	1	2	2	0
Hawkins, Budd D. Reading, Vt.	14	11	3						
Hygrade Seed Co. Fredonia, N. Y.	11	11	0						
Johnson, J. Oliver, & Co. Chicago, Ill.							3	2	1
Landreth, D., Seed Co. Bristol, Pa.	110	105	5	13	11	2	2	0	2
Lyon, John D., Inc. Belmont, Mass.				2	0	2	3	3	0
Mandeville & King Co. Rochester, N. Y.	8	8	0						
Mason's Farm Market Springfield, Mass.	3	3	0						
Meyers, H. W. & Sons Bennington, Vt.				2	2	0			

*Out of business.

Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Michael-Leonard Seed Co..... Chicago, Ill.	7	7	0						
Northrup, King & Co..... Minneapolis, Minn.	10	10	0				1	1	0
Ostberg Seed Co..... Chicago, Ill.	9	9	0	2	0	2	4	0	4
Page Seed Co..... Greene, N. Y.	28	28	0	10	8	2	1	1	0
Pedigreed Seed Co..... New York, N. Y.							1	1	0
Perry Seed Co..... Boston, Mass.	19	19	0						
Philadelphia Seed Co..... Philadelphia, Pa.							1	1	0
Ralston Purina Co..... St. Louis, Mo.	8	7	1						
Rice, Jerome B., Seed Co..... Cambridge, N. Y.	8	8	0						
Ross Bros. Co..... Worcester, Mass.	22	21	1	2	2	0			
Sargent's Grain & Supply Co..... Brockton, Mass.	8	8	0						
Scarlett, Wm. G. & Co..... Baltimore, Md.				9	8	1	2	0	2
Sordillo, Joseph, & Sons..... Boston, Mass.	13	11	2						
Stanford Seed Co..... Buffalo, N. Y.				18	13	5	3	0	3
Sterling Seed Co..... Minneapolis, Minn.	3	3	0						
Templin Bradley Co..... Cleveland, Ohio	12	11	1						
Vaughan's Seed Store..... New York, N. Y.	6	6	0						
Whitney Seed Co..... Buffalo, N. Y.				28	21	7	4	4	0
Woodruff, F. H. & Sons..... Milford, Conn.	89	87	2				2	2	0
Woodruff, S. D. & Sons..... Orange Conn.	97	95	2	34	31	3	1	1	0
Woodworth Bradley, Inc..... Providence R. I.				2	2	0			
Unknown.....	20	0	20						
TOTALS.....	920	870	50	183	148	35	40	26	14

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted in Conjunction with the Department of Olericulture
Grant B. Snyder, Professor

Each year tests are conducted by the Experiment Station to determine the trueness to type of various kinds of vegetable seeds which are offered for sale by the seedsmen in this State. Samples of seed of beans, beets, carrots, corn, radishes, rutabagas, spinach and turnip were purchased by the State Inspectors and sent to the Massachusetts Agricultural Experiment Station at Amherst, where the Department of Olericulture planted the seed in field test plots in order to compare plant characteristics with the labeled variety name.

The soil of the test plot is a fine, sandy loam, well drained and naturally fertile. The land was fitted in the usual manner and a liberal quantity of fertilizer was applied broadcast. A severe drouth during July and early August interfered to a considerable extent with best development of the crops. The spinach plantings bolted to seed very early so that this crop was a complete failure.

Yield records were not taken because of the necessity of using small plots and also because replication of the plantings was not feasible owing to the large number of strains and varieties tested. Conformity to type has been the measure of comparison, and individual plants have been called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration.

In studying the performance records it becomes evident that most of the stocks were true to name and most of them appeared to be highly productive. A few of the lots were evidently poor in germinating ability and so a reading from these lots was impossible.

In a few instances it appeared that the variety had been misnamed or misrepresented but usually these were reasonably good substitutions. Many of the rutabagas were rather badly mixed with turnips, and this has been the case for several years. Several bad mixtures were evident among the lots of sweet corn, and variation in tassel color indicates that a better job of detasseling is necessary in the production fields of hybrids. The quality of the beet stocks has been improving for several years, the carrots were also good. It was evident that a few cases of outright misrepresentation among the various stocks had taken place.

The source of the seed and the laboratory germination is given together with remarks on conformity to type, except that those lots of seed which were tested in the field and were found 100% true-to-type are not included in this table.

Field Tests of Vegetable Seeds

Lab. No	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc.				
New Haven, Conn.				
713 F	Corn	Amherst Farmers' Supply Co., Amherst Stowell's Evergreen.....	..	No germination
753 F	Beet	John C. Bennett Hardware Co., Lowell Detroit Dark Red.....	96	2% obovate—2% oblong
755 F	Beet	Early Wonder.....	98	2% spindle shape—very light color
658 F	Rutabaga	Kingston Hardware Co., Kingston American Purple Top.....	90	10% Turnip
36 F	Beet	W. G. Pearse Co., Fall River Detroit Dark Red.....	98	2% interior light color.
466 F	Beet	Shurtleff Hardware Store, Middleboro Perfected Detroit.....	96	2% obovate—2% oblong
665 F	Beet	Toabe's—Marshfield Hardware Co., Marshfield Crosby's Egyptian.....	98	2% spindle shape
778 F	Rutabaga	United Cooperative Farmers' Exchange, Fitchburg American Purple Top.....	95	5% Turnip
Joseph Breck & Sons, Boston, Mass.				
76 F	Beet	Arlington Strain Crosby Egyptian.....	96	4% obovate
78 F	Carrot	Breck's Danvers Half Long, No. 5559-12.....	96	4% Chantenay type
79 F	Radish	Scarlet Globe, No. 6764-15.....	94	6% off type
606 F	Beet	Fletcher Hardware Co., Watertown Crosby's Egyptian, No. 5305.....	98	2% obovate
747 F	Carrot	Melrose Hardware Co., Inc., Melrose Long Orange Improved.....	98	2% white roots
613 F	Carrot	Richardson Hardware Co., Waltham Breck's Hutchinson.....	88	12% white roots
531 F	Corn	Stoughton Hardware Co., Stoughton Tendergold.....	97	3% green tassels
W. Atlee Burpee Co., Philadelphia, Pa.				
749 F	Radish	C. B. Coburn Co., Lowell French Breakfast.....	98	2% Sparkler
254 F	Beet	Harding Street Grain Store, Worcester Crosby's Egyptian, No. 5910.....	96	4% obovate
221 F	Beet	Schofield Hardware Co., N. Attleboro Burpee's Improved Blood, No. 128.....	94	6% obovate
519 F	Corn	Stone Hardware Co., Brockton Golden Cross Bantam.....	50	50% red anthers
Butler Bros., Chicago, Ill.				
328 F	Beet	Ben Franklin Stores, Arlington Heights Improved Early Blood Turnip.....	96	2% spindle shape—2% off color
329 F	Carrot	Danvers Half Long.....	98	2% cylindrical
617 F	Beet	The Clapper Co., West Newton Crosby's Egyptian.....	96	2% off-color — 2% spindle shape
Comstock, Ferre & Co., Wethersfield, Conn.				
545 F	Beet	J. H. Calarese Hardware Co., Milford Crosby's Egyptian.....	98	2% oblong
315 F	Beet	Frank Cardoza, New Bedford Detroit Dark Red.....	98	2% obovate
313 F	Carrot	W. C. Fuller Co., Mansfield Danvers Half Long.....	96	4% cylindrical
55 F	Beet	G. W. Gardiner & Sons, Fall River Perfected Detroit.....	96	4% green top—light colored
542 F	Beet	L. N. Jacques & Sons, Milford Early Wonder.....	96	4% spindle shape

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type	Remarks
Arthur R. Cone, Buffalo, N. Y.				
S-34 F	Beet	Wrentham State School, Wrentham Early Wonder.....	96	2% spindle shape—2% obovate
Crosman Seed Corp., East Rochester, N. Y.				
181 F	Beet	S. S. Kresge Co., Boston Detroit Dark Red Perfected.....	98	2% obovate
182 F	Radish	French Breakfast.....	98	2% globe
183 F	Radish	Early Long Scarlet.....	10	89% Scarlet Globe—1% Sparkler
Eastern States Farmers' Exchange, Springfield, Mass.				
143 F	Beet	Eastern States Farmers' Exchange, Montello Detroit Dark Red—No. V 904.....	92	2% oblong—6% obovate
Empire Seed Co., Fredonia, N. Y.				
839 F	Beet	Joseph Niedbala, Hadley Early Wonder.....	98	2% oblong
Essex County Co-operative Assoc., Topsfield				
710 F	Beans	Pencil Pod Wax.....	98	2% flat
668 F	Beet	Early Wonder.....	98	2% obovate
676 F	Beet	Asgrow Wonder.....	94	4% obovate—2% oblong
Fredonia Seed Co., Fredonia, N. Y.				
863 F	Beet	Bellingham Hardware Co., Weymouth Early Eclipse.....	94	6% dark color
865 F	Radish	Early Scarlet Globe.....	94	6% long white
Thomas J. Grey Co., Boston, Mass.				
281 F	Beet	Crosby Egyptian Selected.....	94	2% obovate—4% spindle, light green tips
283 F	Radish	French Breakfast.....	98	2% white
Hardee Seeds, West Medford, Mass.				
196 F	Beet	Crowell School, Haverhill Crosby's Egyptian.....	98	2% obovate
199 F	Radish	S. S. Kresge Co., Boston Early Scarlet White Tip.....	98	2% Scarlet Globe
Joseph Harris & Co., East Rochester, N. Y.				
249 F	Beet	Joseph Harris & Co., Lexington Crosby's Egyptian, Harris Special Strain.....	98	2% obovate
443 F	Corn	Lincoln, No. 1360.....	93	7% green tassels
445 F	Radish	Comet, No. 838.....	96	4% Long Scarlet
Charles C. Hart Seed Co., Wethersfield, Conn.				
433 F	Corn	Cleveland Hardware Co., Walpole Improved Golden Bantam.....	..	Hybrid (Probably Lincoln) 7% green tassel mixture
784 F	Radish	Davis Hardware Co., Gardner Early Scarlet Globe.....	98	2% spindle
403 F	Beet	Federal Supply Co., Northampton Detroit Dark Red.....	92	6% interior light color—2% obovate
404 F	Corn	Improved Golden Bantam.....	..	Hybrid (probably Lincoln) 20% green tassels
438 F	Corn	Norwood Hardware & Supply Co., Norwood Early Golden Bantam.....	..	No germination
1 F	Beet	Pierce Hardware Co., Taunton. Detroit Dark Red.....	92	6% off color—2% obovate
470 F	Rutabaga	Saunders Hardware & Paint Co., Middleboro Macomber.....	95%	5% Turnip
735 F	Rutabaga	Fred S. Smith, Reading American Purple Top Yellow.....	95%	5% Turnip
457 F	Beet	Waverly Hardware & Supply Co., Lexington Detroit Dark Red.....	94	6% interior light color

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type	Remarks
Budd D. Hawkins, Reading, Vermont				
264 F	Beet	Brockelman's Market, Worcester Edmand's Early Blood Turnip.....	96	2% obovate—2% oblong
258 F	Rutabaga	Improved Purple Top, Yellow Hardy Swede.....	85	15% Turnip
Hygrade Seed Co., Fredonia, N. Y.				
96 F	Beet	Abraham Lincoln School, East Braintree Detroit Dark Red.....	92	8% obovate
97 F	Beet	Crosby's Egyptian.....	94	2% spindle—4% obovate
98 F	Carrot	Chantenay, Improved Type.....	93	2% Danvers—5% Nantes type
100 F	Radish	Scarlet Globe.....	70	30% white tips
D. Landreth Seed Co., Bristol, Pa.				
553 F	Beet	J. E. Amior Sons, Fall River Detroit Dark Red, No. C-800.....	94	6% obovate
556 F	Radish	Early Scarlet Globe.....	98	2% long
555 F	Rutabaga	Macomber, No. C-494.....	95	5% Turnip
Belchertown State School				
S-197 F	Beet	Detroit Dark Red.....	98	2% obovate
S-204 F	Beans	Pencil Pod Black Wax, TC.1386.....	98	2% flat podded plants
Conlon & Donnelly Co., Attleboro				
229 F	Beet	Detroit Dark Red.....	98	2% obovate
227 F	Corn	Golden Bantam Improved, 10-14 Rowed BC-72.....	97	3% off type
228 F	Corn	Lincoln Hybrid, BC 482.....	93	7% Purdue 39
Grafton State Hospital..				
S-193 F	Beet	Early Wonder.....	98	2% obovate
S-192 F	Corn	Marcross, 6-13 BB 444.....	85	15% off type—probably Carmelcross
Massachusetts Reformatory, Concord				
S-124 F	Corn	Golden Cross Bantam.....	..	50% red tassel—50% green tassel
S-111F	Radish	Early Scarlet Globe.....	96	2% long—2% white
Sunshine Feed Store, Bridgewater				
476 F	Corn	Lincoln.....	97	3% green anthers
Uxbridge Hardware Co., Uxbridge				
649 F	Beet	Egyptian Extra Flat.....	98	2% oblong
663 F	Beet	Edmand's Early Blood.....	96	4% oblong
647F	Radish	French Breakfast.....	96	4% Sparkler
Frank L. Whitcomb, Amherst				
785 F	Corn	Spancross, P-39.....	..	A mixture—contains Spancross, large red tasseled (probably Lincoln) and green tasseled short (probably Golden Cross)
Worcester State Hospital, Worcester				
S-134F	Rutabaga	Long Island Improved.....	80	20% Turnip
Mandeville & King Co., Rochester, N. Y.				
209 F	Beet	D. J. Mahoney, Bradford Detroit Dark Red.....	98	2% obovate
212 F	Rutabaga	American Purple Top.....	90	10% Turnip
Michael-Leonard Seed Co., Chicago, Ill.				
817 F	Rutabaga	Clark Hardware Co., Greenfield American Purple Top.....	85	15% Turnip
Mutual Plumbing & Heating Co., Amherst				
792 F	Corn	Hybrid Tendergold.....	94	6% green tassel
796 F	Radish	Early Scarlet Globe.....	96	4% long
795 F	Rutabaga	American Purple Top.....	85	15% Turnip
Waldron Hardware Co., Taunton				
354 F	Corn	Hybrid Sweet Tendermost.....	96	4% red tasseled
Northrup, King & Co., Minneapolis, Minn.				
66 F	Beet	F. W. Woolworth Co., Boston Early Blood Turnip.....	94	6% light colored
69 F	Radish	French Breakfast.....	94	6% round

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type $\frac{\text{c}}{\text{c}}$	Remarks
Page Seed Co., Greene, N. Y.				
162 F	Beet	J. H. Fairbanks Co., Bridgewater Crosby's Egyptian.....	96	4% obovate
164 F	Rutabaga	American Purple Top, No. Y 5-6145..	95	5% Turnip
Perry Seed Co., Boston, Mass.				
114 F	Beet	Crosby's Early Egyptian, No. 1150...	90	8% obovate—2% oblong
121 F	Corn	Lincoln, No. 2425.....	85	15% Purdue 39
Ralston Purina Co., St. Louis, Mo.				
Checkerboard Feed Store, Taunton				
166 F	Beet	Detroit.....	98	2% obovate
167 F	Carrot	Chantenay.....	98	2% Danvers
Ross Bros., Worcester, Mass.				
372 F	Beet	Early Wonder.....	96	2% flat—2% obovate
380 F	Corn	Lincoln, No. 1998.....	75	25% off type (green tassels)
Swan's Hardware Co., Westboro				
317 F	Beet	Early Blood Turnip.....	98	2% obovate
Leon Zocchi, Co., Milford				
536 F	Corn	Marcross Hybrid.....	90	10% very tall mixture
Sargent's Grain & Supply Co., Brockton				
513 F	Beet	Crosby's Egyptian.....	98	2% oblong
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Lawrence				
693 F	Beet	Early Blood Turnip.....	94	4% obovate—2% oblong
Sears, Roebuck & Co., Quincy				
131 F	Beet	Crosby's Egyptian.....	98	2% obovate
135 F	Rutabaga	American Purple Top, No. 4334.....	95	5% Turnip
Joseph Sordillo & Sons, Boston, Mass.				
268 F	Beet	Large Blood.....	98	2% obovate
265 F	Carrot	Danvers.....	96	4% very light yellow
The Templin Bradley Co., Cleveland, Ohio				
(The Children's Flower Mission)				
Washington School, Taunton				
344 F	Beet	Crosby's Egyptian.....	96	4% obovate
Vaughan's Seed Store, New York, N. Y.				
Cogger's, Saugus				
683 F	Beet	Crosby's Egyptian.....	92	8% spindle shape—light color
685 F	Radish	Early Scarlet Globe.....	96	4% light color
F. H. Woodruff & Sons, Milford, Conn.				
W. E. Aubuchon Co., Northampton				
630 F	Radish	Special Scarlet Globe.....	96	4% long white tip
Philip Elmer Hardware Co., Millers Falls				
825 F	Radish	French Breakfast.....	98	2% long white
General Mills, Inc., Middleboro				
21 F	Beet	Detroit Dark Red No. 1-725.....	98	2% interior light color
22 F	Carrot	Danvers Half Long, No. 1-6161.....	90	10% Chantenay type
Methe, Inc., Springfield				
426 F	Carrot	Danvers Half Long.....	94	6% cylindrical
425 F	Corn	Hybrid Sweet Lincoln, No. 25750.....	93	7% green tassel
J. O. Neill Supply Co., Fall River				
559 F	Beet	Early Blood Turnip.....	92	4% obovate—4% off color—flesh
Winer's Hardware Co., Randolph				
913 F	Radish	Sparkler White Tip, No. 2-744.....	94	6% long white
S. D. Woodruff & Sons, Orange, Conn.				
Allen Hardware Co., Needham				
369 F	Radish	French Breakfast.....	94	6% Globe
Copeland Hardware Co., Taunton				
177 F	Carrot	Hutchinson.....	97	3% very light colored
Farm & Garden Supply Co., Uxbridge				
638 F	Beet	Early Wonder, No. 3172-2.....	98	2% off color

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
S-88F	Rutabaga	Medfield State Hospital, Medfield Long Island Improved, No. 4215.....	90	10% Turnip
236 F	Carrot	Monroe's Seed Market, Attleboro Danvers—No. 4048.....	88	12% cylindrical
Unknown:				
320 F	Carrot	W. E. Aubuchon Co., Marlboro Danvers Half Long.....	92	8% cylindrical
319 F	Beet	Detroit Dark Red.....	94	4% oblong—2% obovate

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor
and
John L. Creech, Instructor

For the eleventh season the Department of Floriculture has cooperated with the Seed Laboratory in conducting trials to determine the quality of flower seeds offered for sale in retail seed stores, hardware stores, chain stores, schools, and other retail outlets. The seeds, collected by the Seed Inspector, were tested in the field for germination and performance.

All seeds were sown on June 19. A second sowing was made, if seed was available, for those varieties which gave unsatisfactory results in the first sowing. The results of such duplicate tests are indicated by the letter "D" in the table.

Seeds of 226 lots, representing 50 genera, packeted by 30 concerns and obtained from 51 retail sources, were distributed as follows:

Ageratum.....	3	Delphinium.....	5	Lupinus.....	2
Alyssum.....	5	Dianthus.....	8	Mathiola.....	4
Antirrhinum.....	7	Dimorphotheca.....	1	Mirabilis.....	3
Brachycome.....	1	Eschscholtzia.....	3	Nicotiana.....	4
Calendula.....	9	Gaillardia.....	2	Papaver.....	5
Callistephus.....	8	Gilia.....	1	Petunia.....	10
Cassia.....	1	Godetia.....	1	Phlox.....	3
Celostia.....	2	Gypsophila.....	5	Portulaca.....	5
Centaurea.....	6	Helianthus.....	3	Reseda.....	4
Cheiranthus.....	2	Helichrysum.....	3	Salpiglossis.....	2
Chrysanthemum.....	1	Iberis.....	4	Sanvitalia.....	1
Clarkia.....	4	Impatiens.....	2	Tagetes.....	16
Convolvulus.....	1	Ipomoea.....	9	Tithonia.....	1
Cosmos.....	6	Kochia.....	2	Tropaeolum.....	8
Crotalaria.....	1	Linaria.....	2	Verbena.....	4
Cynoglossum.....	1	Linum.....	2	Zinnia.....	38
Dahlia.....	3	Lobelia.....	2		
TOTAL.....					226

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, with only one-third or less of the plants not true to form or color; "fair", between one-third and two-thirds not true; and "not satisfactory" if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. Since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

The amount of seed per packet appeared to be more variable this year than has been the case in previous years. In many instances the amount was not sufficient for sowing 30 inches of row. It seems evident that prices per packet have not been increased, but the quantity of seed per packet has been reduced.

A comparison of results of germination in 1945 and 1946 indicates that a higher quality of seeds was offered this year.

Rating	1945		1946	
	Number of Lots	Percent of Total	Number of Lots	Percent of Total
Good	108	42.19	179	79.30
Fair	69	26.95	29	12.77
Poor	79	30.86	14	6.16
None	0	0.00	4	1.77
	<hr/> 256	<hr/> 100.00	<hr/> 226	<hr/> 100.00

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Joseph Breck & Sons, Boston, Mass.				
581F	Ageratum	Blue Ball Improved.....	Good	Satisfactory
580F	Antirrhinum	Large Flowered Giant.....	Good	Satisfactory
582F	Calendula	Breck's Giant Orange.....	Fair	Satisfactory
585F	Cassia	Fasciculata Gold Coin Flower.....	Fair	Satisfactory
583F	Centaurea	Bachelor's Button Double Pinkie....	Good	Satisfactory
586F	Convolvulus	Minor Royal Ensign.....	Good	Satisfactory
591F	Crotalaria	Retusa Golden Sweet Pea.....	Poor	Not satisfactory; only 1 plant
584F	Dianthus	Carnation, Chabaud's Giant Mixed..	Good	Incomplete; had not flowered Oct. 13
589F	Petunia	Breck's White Giant.....	Good	Satisfactory
587F	Tagetes	Marigold-Carnation-flowered.....	Poor	Not satisfactory
588F	Tagetes	Marigold-Scarlet Glow.....	Fair	Satisfactory
590F	Zinnia	Dahlia-flowered Exquisite.....	Good	Satisfactory
Abington Hardware Co., Abington				
892F	Chrysanthemum	Single Mixed.....	Good	Not satisfactory; only 1 color
890F	Cosmos	Midsummer Giant Mixed.....	Good	Satisfactory
891F	Lupinus	Hartwegi Mixed.....	Good	Incomplete; had not flowered Oct. 13
893F	Mathiola	Stock Perfection Mixed.....	Good	Satisfactory
Wood's Hardware Co., Wollaston				
704F	Gypsophila	Giant White.....	Good	Satisfactory
702F	Iberis	Candytuft-Choice Mixture.....	Good	Not satisfactory; only 2 colors
703F	Reseda	Mignonette-Old-fashioned Sweet....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Brown Seed Co., Grand Rapids, Mich.				
Alden's, Inc., Campello				
491F	Centaurea	Bachelor's Button.....	Fair	Satisfactory
492F	Iberis	Candytuft.....	Good	Satisfactory
493F	Tagetes	Marigold-Dwarf French.....	Good	Satisfactory
494F	Zinnia	Elegans.....	Good	Satisfactory
Baker's 5c-\$1.00 Store, Hingham				
887F	Cosmos	Orange Flame.....	Good	Satisfactory
886F	Linaria	Superb Mixed.....	Good	Satisfactory; 7 colors
888F	Lobelia	Dwarf Blue.....	None	
Ben Franklin Stores, Arlington Heights				
336F	Eschscholtzia	California Poppy, Extra Golden.....	Fair	Satisfactory
337F	Ipomoea	Morning Glory—Heavenly Blue.....	Good	Satisfactory
338F	Tropaeolum	Nasturtium—Golden Gleam.....	Good	Satisfactory
The Clapper Co., West Newton, Mass.				
628F	Ageratum	Blue Cap.....	Good	Satisfactory
626F	Nicotiana	Sanderae Hybrids.....	Fair	Satisfactory; 4 colors
625F	Petunia	Rosy Morn.....	Good	Not satisfactory; 3 colors
627F	Zinnia	Linearis.....	Good	Satisfactory
Comstock, Ferre & Co., Wethersfield, Conn.				
William Flynn & Son, Attleboro				
245F	Ipomoea	Morning Glory, Mixed.....	Good	Satisfactory; 3 colors
Crosman Seed Corp., East Rochester, N.Y.				
S. S. Kresge Co., Boston				
833F	Antirrhinum	Snapdragon, Mixed.....	Good	Satisfactory; 3 colors
726F	Callistephus	Aster-Super Giant El Monte.....	Good	Satisfactory
837F	Centaurea	Sweet Sultan Mixed Colors.....	Good	Incomplete; had not flowered Oct. 13
723F	Celosia	Cristata Cockscomb Double Dwarf Mixed.....	Good	Not satisfactory; only 2 colors
725F	Clarkia	Mixed colors.....	Good	Satisfactory
729F	Cynoglossum	Firmament Dwarf.....	Good	Satisfactory
727F	Delphinium	Larkspur—Carmine King.....	Good	Satisfactory
728F	Dianthus	Heddewigii—Double Pinks Mixed.....	Good	Not satisfactory; numerous singles
836F	Helianthus	Double Sunflower Orange.....	Good	Satisfactory
731F	Impatiens	Balsam—Double Camellia-flowered.....	Good	Satisfactory; 5 colors
722F	Reseda	Mignonette—Large Flowering Sweet.....	Good	Satisfactory
724F	Tagetes	Marigold—New Guinea Gold.....	Good	Satisfactory
J. A. Tepper Co., Orange				
834F	Centaurea	Bachelor's Button Double Ruby Red.....	Good	Satisfactory
835F	Koehia	Mexican Fire Bush.....	Good	Satisfactory
832F	Portulaca	Mixed Colors.....	Good	Satisfactory
829F	Tagetes	Marigold—Gigantea Sunset Giants.....	Good	Satisfactory
831F	Tagetes	Marigold—Yellow Pygmy.....	Good	Satisfactory
828F-A	Zinnia	Baby Lilliput or Pompon.....	Fair	Satisfactory; yellow
828F-B	Zinnia	Baby Lilliput or Pompon.....	Good	Satisfactory; 7 colors
828F-C	Zinnia	Baby Lilliput or Pompon.....	Good	Not satisfactory; included large flowered type
830F	Zinnia	Mexican Double Mixed Colors.....	Good	Not satisfactory; only 3 colors
Deerington Zinnia Gardens, Bargarville, Ind.				
J. J. Newberry Co., Whitman				
895F	Zinnia	Double Mixed.....	Good	Satisfactory; 7 colors
894F	Zinnia	Royal Golden-Orange.....	Good	Satisfactory
896F	Zinnia	Special Baby Bee Double Mixed.....	Good	Satisfactory; 6 colors
Empire Seed Co., Fredonia, N. Y.				
Joseph Niedbala, Hadley				
847F	Calendula	Double Mixed.....	Fair	Satisfactory
846F	Zinnia	Giant Dahlia-flowered Mixed.....	Good	Not satisfactory; small flowered

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Ferry-Morse Seed Co., Detroit, Mich.				
813F	Callistephus	Carlisle Hardware Co., Springfield	Good	Satisfactory
814F	Verbena	Aster-Rosalie Branching..... Scarlet Defiance.....	Poor	Not satisfactory
Melrose Hardware Co., Melrose				
746F	Portulaca	Single Mixed.....	Good	Satisfactory; 5 colors
Waite Hardware Co., Worcester				
944F	Antirrhinum	Snapdragon Mixed.....	Good	Satisfactory; 4 colors
945F	Callistephus	Aster—Giant Crego Mixed.....	Fair	Satisfactory; 3 colors
943F	Dahlia	Unwins Dwarf Hybrids.....	Good	Satisfactory
946F	Papaver	Poppy—Double Shirley Sweet Eriar.....	Fair	Satisfactory
947F	Salpiglossis	Mixed.....	Good	Satisfactory; 4 colors
Fredonia Seed Co., Fredonia, N. Y.				
Bellingham Hardware Co., Weymouth				
869F	Iberis	Candytuft, White.....	Good	Satisfactory
870F	Gypsophila	Large-flowered.....	Good	Satisfactory
871F	Zinnia	Lilliput or Dwarf Mixed.....	Good	Satisfactory; 8 colors
George E. Warren Hardware Co., Braintree				
921F	Calendula	Orange King.....	Good	Satisfactory
920F	Callistephus	Aster—Queen of the Market Mixed.....	Good	Satisfactory; 3 colors
919F	Helichrysum	Straw Flower Finest Mixed.....	Good	Incomplete; injured by frost
918F	Mathiola	Stock—Finest Mixed Double.....	Good	Not satisfactory; only 2 colors
922F	Zinnia	Giant Red.....	Good	Satisfactory
Genesee Valley Seed Co., Daiten, N. Y.				
S. S. Kresge Co., Boston				
720F	Calendula	Campfire.....	Fair	Satisfactory
719F	Tagetes	Marigold, Crown of Gold.....	Good	Satisfactory
721F	Zinnia	Fantasy Wildfire.....	Good	Satisfactory
Thomas J. Grey Co., Boston, Mass.				
568F	Alyssum	Carpet of Snow.....	Good	Satisfactory
570F	Calendula	Campfire Sensation.....	Good	Satisfactory
569F	Callistephus	Aster—Royal Branching Dark Lavender.....	Fair	Satisfactory
571F	Cosmos	Mammoth Early Pink Single.....	Good	Satisfactory
572F	Helichrysum...	Everlasting Violet.....	Good	Incomplete; injured by frost
576F	Mathiola	Stock Giant Imperial Dark Blue.....	Good	Satisfactory
574F	Nicotiana	Affinis—White Fragrant.....	Good	Satisfactory
575F	Salpiglossis	Rose, Golden Veined.....	Good	Satisfactory
573F	Tagetes	Marigold, Sunbeam Dwarf Double Quilled.....	Poor	Not satisfactory
577F	Zinnia	Double Crimson.....	Good	Satisfactory
Hardee Seeds, West Medford, Mass.				
Crowell School, Haverhill				
204F	Centaurea	Bachelor's Button Special Mixture...	Good	Satisfactory; 3 colors
203F	Cosmos	Giant Late—Single Mixed.....	Good	Incomplete; had not flowered Oct. 13
205F	Gypsophila	White Baby's Breath.....	Good	Satisfactory
206F	Tropaeolum	Nasturtium Double Gleam Mixture...	Good	Satisfactory; 2 colors
207F	Zinnia	California Giants.....	Good	Satisfactory; 4 colors
Joseph Harris & Co., Rochester, N. Y.				
Joseph Harris & Co., Lexington				
452F-D	Antirrhinum	Snapdragon Harris' Colossal Mixed..	Good	Incomplete; had not flowered Oct. 13
451F	Calendula	Large Flowered Mixture.....	Fair	Satisfactory; 3 colors
453F	Zinnia	Fantasy—Mixed Colors.....	Good	Satisfactory; 4 colors
Charles C. Hart Seed Co., Wethersfield, Conn.				
Davis Hardware Co., Gardner				
782F	Tropaeolum	Nasturtium—Golden Gleam.....	Good	Satisfactory
Federal Supply Co., Northampton				
405F	Ageratum	Blue Perfection.....	Poor	Not satisfactory
406F	Sanvitalia	Creeping Zinnia.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Charles C. Hart Seed Co.—Continued				
Henry's Paint & Wallpaper Co., Worcester				
950F-D	Gaillardia	Blanket Flowered Mixed.....	Fair	Incomplete; had not flowered Oct. 13
949F	Ipomoea	Morning Glory Improved Heavenly Blue.....	Good	Satisfactory
916F	Nicotiana	Affinis Hybrids.....	Good	Satisfactory; 2 colors
Mutual Plumbing & Heating Co., Amherst				
799F-D	Antirrhinum	Snapdragon—Giants Mixed.....	Good	Incomplete; had not flowered Oct. 13
798F	Eschscholtzia	California Poppy.....	Good	Satisfactory
C. F. Paige Co., Athol				
633F	Tropaeolum	Nasturtium—Tall Mixed.....	Good	Satisfactory; 4 colors
P. A. Richards Hardware Co., Spencer				
860F	Helianthus	Sunflower—Mammoth Russian.....	Good	Satisfactory
859F	Lupinus	Lupine Hartwegi Mixed.....	Good	Incomplete; had not flowered Oct. 13
858F	Tagetes	Marigold—Collarette.....	Good	Satisfactory
Budd D. Hawkins, Reading, Vermont				
I. B. Barrows Co., Worcester				
397F	Phlox	Fine Mixed Colors.....	Fair	Satisfactory; 3 colors
396F	Zinnia	Dahlia Flowered—Giant Salmon....	Fair	Satisfactory
Horn Seed Co., Oklahoma City, Okla.				
Albert Steiger Co., Springfield				
801F-A	Zinnia	Dahlia-flowered Canary Bird.....	Good	Satisfactory
801F-B	Zinnia	Dahlia-flowered Oriole.....	Poor	Not satisfactory
801F-C	Zinnia	Dahlia-flowered Dream.....	Good	Satisfactory
801F-D	Zinnia	Dahlia-flowered Exquisite.....	Fair	Satisfactory
801F-E	Zinnia	Dahlia-flowered Polar Bear.....	Good	Satisfactory
801F-F	Zinnia	Dahlia-flowered Crimson Monarch....	Good	Satisfactory
801F-G	Zinnia	Dahlia-flowered Scarlet Flame.....	Good	Satisfactory
801F-H	Zinnia	Dahlia-flowered Purple Prince.....	Good	Satisfactory
Hygrade Seed Co., Fredonia, N. Y.				
Abraham Lincoln School, Braintree				
108F	Calendula	Mixed colors.....	Good	Satisfactory; 2 colors
110F	Ipomoea	Morning Glory Heavenly Blue.....	Good	Satisfactory
109F	Tagetes	Marigold Orbit.....	Good	Satisfactory
111F	Tropaeolum	Nasturtium Golden Gleam.....	Good	Satisfactory
112F	Zinnia	California Giants Mixed.....	Good	Not satisfactory; only 2 colors
D. Landreth Seed Co., Bristol, Pa.				
C. D. Hardware Co., Rockland				
874F-D	Callistephus	Aster Crego's Giant-Comet Mixed...	Good	Incomplete; had not flowered Oct. 13
872F	Cheiranthus	Wallflower-Large Single Mixed.....	Good	Satisfactory; 3 colors
873F	Dianthus	Pinks Chinesis Double Mixed.....	Good	Satisfactory; 5 colors
875F	Mirabilis	Four O'clock Mixed.....	Fair	Satisfactory; 4 colors
876F	Zinnia	Dahlia-flowered Mixed.....	Good	Satisfactory; 5 colors
Sunshine Feed Stores, Bridgewater				
479F	Alyssum	Saxatile Yellow (Perennial).....	None	
478F	Ipomoea	Scarlet O'Hara.....	Good	Satisfactory
477F	Zinnia	Golden Dahlia Canary Bird.....	Good	Satisfactory
Mandeville, King & Co., Rochester, N. Y.				
Carlisle Hardware Co., Springfield				
812F	Dimorphotheca	African Daisy, All Colors.....	Good	Satisfactory; 4 colors
Mason's Farm Market, Springfield				
808F	Ipomoea	Morning Glory, Scarlet O'Hara.....	Good	Satisfactory
809F	Tropaeolum	Nasturtium Dwarf Mixed.....	Good	Satisfactory; 4 colors
C. F. Paige Co., Athol				
634F	Zinnia	Scarlet Dwarf.....	Good	Satisfactory
Parker's Farm Supply Co., Wakefield				
740F	Petunia	General Dodds.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Mandeville, King & Co.—Continued				
611F	Phlox	Richardson's Hardware Co., Waltham	None	
612F	Tagetes	Drummond's All Colors	Fair	Satisfactory
J. B. Sibley Co., Ware				
851F-D	Antirrhinum	Snapdragon Magic Carpet	Fair	Incomplete; had not flowered Oct. 13
853F	Cheiranthus	Siberian Wallflower	Good	Satisfactory
852F	Gilia	Capitata Queen Anne's Thimble	Good	Satisfactory
854F	Linum	Scarlet Flax	Good	Incomplete; had not flowered Oct. 13
Albert Steiger Co., Springfield				
804F-D	Papaver	Poppy Double Shirley Rose Pink	Good	Satisfactory
803F	Petunia	Radiance	Good	Satisfactory
802F	Tithonia	Mexican Sun-Flower	Good	Satisfactory
Walsh & Packard, Hingham				
883F	Gaillardia	Indian Chief	Good	Satisfactory
885F	Verbena	White	Good	Satisfactory
884F	Zinnia	Lilliput Black Ruby	Good	Satisfactory
Northrup, King & Co., Minneapolis, Minn.				
F. W. Woolworth Co., Wollaston				
930F	Clarkia	Double Mixed	Good	Satisfactory; 3 colors
938F	Delphinium	Giant Imperial Blue Spire	Good	Satisfactory
932F	Dianthus	Heddeewiggi Lacinatus Single	Good	Satisfactory; 4 colors
933F	Dianthus	Pinks Double Mixed	Good	Satisfactory; 3 colors
934F	Gypsophila	Crimson Baby's Breath	Good	Satisfactory
935F	Linum	Grandiflorum Rubrum Scarlet Flax	Good	Incomplete; had not flowered Oct. 13
931F	Mirabilis	Four O'clock Mixed	Good	Satisfactory; 4 colors
939F	Reseda	Mignonette Sweet Scented	Good	Satisfactory
936F	Zinnia	Lilliput or Pompon Mixed	Good	Satisfactory; 5 colors
937F	Zinnia	Navajo-flowered Mixed	Good	Satisfactory; 5 colors
Page Seed Co., Greenc, N. Y.				
George E. Warren Hardware Co., Braintree				
923F	Helianthus	Sunflower Mammoth Russian	Good	Satisfactory
Frank M. Whitcomb, Amherst				
788F	Cosmos	Orange Flare	Poor	Not Satisfactory
791F	Dianthus	Pink Single Mixed	Good	Satisfactory; 4 colors
790F	Portulaca	Double Dwarf Mixed	Good	Satisfactory; 5 colors
789F	Tagetes	Marigold Guinea Gold	Good	Satisfactory
Perry Seed Co., Boston, Mass.				
301F	Calendula	Perry's Orange King	Fair	Satisfactory
302F	Cosmos	Sensation Dazzler	Good	Satisfactory
304F	Delphinium	Larkspur Brilliant Rose Salmon	Fair	Satisfactory
303F	Dianthus	Heddeewiggi Double Mixed	Good	Satisfactory; 3 colors
309F	Mathiola	Stock Large Flowering Ten Week Dwarf	Good	Satisfactory
308F	Papaver	Perry's Superb Single and Double Shirley	Good	Satisfactory; 3 colors
307F	Petunia	Celestial Rose	Good	Satisfactory
306F	Reseda	Mignonette Old Fashioned Sweet Scented	Good	Satisfactory
305F	Tagetes	Marigold Sunkist	Good	Satisfactory
310F	Zinnia	Dahlia-flowered Luminosa	Good	Satisfactory
Ralston Purina Co., Chicago, Ill.				
Checkerboard Feed Store, Taunton				
175F	Delphinium	Larkspur Double Stock-flowered Mixed	Fair	Satisfactory; 3 colors
174F	Petunia	Bedding Mixture	Good	Satisfactory; 6 colors
Jerome B. Rice Seed Co., Cambridge, N. Y.				
Clark Hardware Co., Greenfield				
819F	Clarkia	Double Mixed	Good	Satisfactory; 3 colors
820F	Linaria	Superb Mixed	Good	Satisfactory; 5 colors
818F-D	Lobelia	Dwarf Blue	None	
Coyle Hardware Co., Wakefield				
743F	Clarkia	Double Mixed	Good	Satisfactory; 4 colors
742F	Iberis	Candytuft	Good	Satisfactory; 2 colors
744F	Verbena	Red	Good	Satisfactory
745F	Zinnia	Crown O'Gold	Fair	Not satisfactory; mixed colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Ross Bros. Co., Worcester, Mass.				
387F	Alyssum	Little Gem	Good	Satisfactory
389F	Calendula	Orange King	Fair	Satisfactory
386F	Callistephus	Aster Super Giant Los Angeles	Poor	Not satisfactory
388F	Centaurea	Bachelor's Button Double Blue	Fair	Satisfactory
390F	Ipomoea	Morning Glory Heavenly Blue	Good	Satisfactory
395F	Nicotiana	Affinis	Good	Satisfactory; 3 colors
393F	Petunia	Rose of Heaven	Good	Satisfactory
391F	Tagetes	Marigold Spry	Good	Satisfactory
392F	Tropaeolum	Nasturtium Golden Globe	Good	Satisfactory
394F	Zinnia	Dahlia-flowered Exquisite	Good	Satisfactory
Cate Hardware Co., Shrewsbury				
940F	Petunia	Flaming Velvet	Good	Satisfactory
941F-D	Phlox	Annual Mixed	Poor	Not satisfactory
942F	Tagetes	Marigold French Double Mixed	Good	Not satisfactory; yellow only
Philip Elmer, Millers Falls				
826F	Kochia	Scoparia Mexican Fire Bush	Poor	Not satisfactory
827F-D	Papaver	Poppy Shirley Mixed	Good	Satisfactory; 2 colors
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Brockton				
510F	Dahlia	Unwin's Dwarf Mixed	Good	Satisfactory; 4 colors
509F	Delphinium	Larkspur Carmine King	Fair	Satisfactory
Sears, Roebuck & Co., Lawrence				
695F	Celosia	Cockscomb Tall Feathered Mixed	Good	Satisfactory
696F	Impatiens	Balsam Double Mixed	Good	Satisfactory
Sterling Seed Co., Minneapolis, Minn.				
J. J. Newberry Co., Bridgewater				
906F	Alyssum	Violet Queen	Good	Satisfactory
898F	Callistephus	Aster Crego or Ostrich Plume White	Good	Satisfactory
908F	Brachycome	Swan River Daisy	Poor	Not satisfactory
899F	Dahlia	Unwin's Dwarf Hybrids Mixed	Good	Satisfactory; 4 colors
910F	Dianthus	Pinks Double Mixed	Good	Not satisfactory; only 2 colors
905F-D	Godetia	Satin Flowered Tall Mixed Double	Fair	Incomplete; had not flowered Oct. 13
900F	Helichrysum	Everlasting Mixed	Good	Incomplete; had not flowered Oct. 13
909F	Ipomoea	Noctiflora Moonflower	Poor	Not satisfactory
907F	Portulaca	Single Mixed	Good	Satisfactory; 7 colors
897F	Verbena	Mammoth Flowering Blue Shades	Poor	Not satisfactory
J. J. Newberry Co., Whitman				
901F	Zinnia	Fantasy Mixed	Good	Not satisfactory; 2 colors
Vaughan's Seed Store, New York, N.Y.				
Carlisle Hardware Co., Springfield				
815F	Tagetes	Marigold Mexican (Signata Pumila)	Good	Satisfactory
Cogger's, Saugus				
688F	Alyssum	Violet Queen	Fair	Satisfactory
690F	Petunia	Rose of Heaven	Good	Satisfactory
689F	Portulaca	Double Best Mixed	Good	Satisfactory; 8 colors
Fair's Flower Shop, Dorchester				
928F	Antirrhinum	Snapdragon, Univ. of California Mixed	Poor	Not satisfactory
929F	Eschscholtzia	California Poppy	Good	Satisfactory
927F	Ipomoea	Morning Glory Heavenly Blue	Good	Satisfactory
926F	Mirabilis	Four O'clock Mixed	Good	Satisfactory; 5 colors
925F	Zinnia	Giant Dahlia-flowered Golden Dawn	Good	Satisfactory
F. H. Woodruff & Sons, Milford, Conn.				
Rome Bros. Hardware Co., Rockland				
882F	Tropaeolum	Nasturtium Golden Gleam	Good	Not satisfactory; included red

AGRICULTURAL EXPERIMENT STATION
MASSACHUSETTS

CONTROL SERIES

BULLETIN NO. 132

JUNE 1947

**Inspection of Commercial
Feedstuffs**

By Feed Control Service Staff

This, the fifty-third report of feeding stuffs inspection, contains, in addition to information required by statute, carotene determinations on alfalfa products and other data of importance in determining the value of a feedstuff.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

John W. Kuzmeski, *Official Chemist*
Albert F. Spelman, *Senior Chemist*
C. Tyson Smith, *Assistant Chemist*
Joseph Bart, *Junior Chemist*
Charles J. Rogers, *Junior Chemist*

Frederick A. McLaughlin, *Microscopist*
Joseph A. Martell, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Senior Clerk*

The spring, summer and early fall of 1946 found the feed industry operating under more chaotic conditions than it had experienced during any one of the other war years. In fact the shortage of some feed ingredients was the worst in the feed industry's history.

Factors such as the government purchases of wheat and corn for export, government price ceilings, transportation difficulties, etc., interfered with the normal flow to the feed manufacturers of even those ingredients that otherwise would have been more easily available. As a result, during this period buying of feed materials was strictly a "hand to mouth" proposition. "Trade-back", "tie-in" sales, and other peculiar activities probably were more prevalent than was indicated by surface appearances. With many feed manufacturers, to produce a mixed feed was a case of using the ingredients at hand at the time of mixing.

Under such conditions, especially in the Northeast where the feed situation was the most critical, it is understandable why many feeds at that time contained ingredients that differed considerably from those registered. In many cases the analysis also compared unfavorably with the guarantees.

The table of deficient samples given in this bulletin contains, for the most part, samples collected during the fall of 1946. Many of the lots represented by the samples analyzed were manufactured during the period of desperate feed shortages.

It may be a significant fact that certain feed manufacturers who maintain scrupulously the guarantees on their products in normal times also managed to maintain these guarantees remarkably well even during the feed crisis although numerous feed ingredient substitutions had to be made.

However, most feed manufacturers did an excellent job of producing fair to good quality feeds under extremely adverse circumstances.

Brands Substantially Complying with Guarantees

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash	
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed		
Acme-Evans Co., Inc.												
Acme Wheat Bran	9.5	15.0	4.8	3.0	54.9	10.0	8.4	10.0	5.9			
Albers Milling Co.												
Albers Calf Manna	6.6	25.0	3.6	4.0	52.7	5.0	4.0	5.0	7.2			
Allied Mills, Inc.												
Economy Laying Mash	8.3	18.0	5.1	3.0	53.0	8.0	6.5	8.0	7.0			
Wayne All Mash Egg	9.3	15.0	4.1	2.5	55.2	8.0	8.5	8.0	6.6			
Wayne Breeder Mash	8.5	20.1	4.7	3.0	50.7	8.0	7.3	8.0	8.7			
Wayne Calf Meal	9.2	24.0	4.2	3.0	46.1	7.0	7.5	7.0	8.3			
Wayne Chick Starter	9.5	19.7	5.0	3.0	51.1	7.2	7.5	7.0	7.2			
Wayne Complete Calf Feed	9.6	16.3	5.0	3.0	55.0	11.0	7.2	11.0	6.9			
Wayne 20% Dairy Ration	9.0	20.8	4.5	3.0	49.6	8.9	8.9	10.0	7.2			
Wayne 16% Dairy Ration	9.3	18.0	5.2	3.0	51.8	9.6	9.6	10.0	6.4			
Wayne Egg Mash	9.1	16.9	4.1	3.0	54.4	7.1	7.1	10.0	8.2			
Wayne Fitting Ration	9.2	19.1	4.4	3.0	50.9	8.0	9.3	8.0	7.2			
Wayne Flushing Mash	9.3	15.6	5.1	3.0	54.6	9.0	9.0	9.0	6.5			
Wayne Growing Mash	7.6	22.9	3.5	3.0	52.1	7.0	4.5	7.0	7.7			
Wayne Horse Feed	9.2	17.2	4.7	3.0	55.0	8.7	8.7	8.0	6.8			
Wayne Pork Maker	9.1	10.6	4.3	2.5	64.3	8.6	8.6	12.0	3.0			
Wayne Rabbit Pellets	9.4	15.5	3.4	3.0	57.4	6.8	6.8	8.0	7.8			
Wayne Turkey Growing Pellets	8.7	14.7	4.3	3.0	55.2	9.1	9.1	16.0	7.3			
Wayne Turkey Growing Pellets	8.7	21.9	5.0	3.0	48.5	8.0	7.6	8.0	8.3			
American Flours, Inc.												
American Ace Wheat Bran	8.6	16.9	4.8	3.5	53.8	11.0	9.9	11.0	6.0			
Arcady Farms Milling Co.												
Arcady Egg & Breeder Mash	9.0	20.6	5.1	3.5	47.2	7.1	7.1	8.0	11.0			
Arcady 85% Grain Horse Feed	10.5	9.9	4.2	2.5	67.0	6.0	6.3	11.0	3.0			
Rockland Rabbit Ration	8.2	10.0	4.6	2.5	66.3	6.0	6.0	11.0	2.6			
Sunkist Egg Mash	8.8	18.2	2.2	2.5	51.8	13.8	13.8	16.0	5.2			
Wonderfat Station Feed with Kollod Oats	8.1	19.4	4.3	3.5	48.7	9.0	9.0	9.0	10.4			
Wonderfat Station Feed with Kollod Oats	8.1	15.0	5.2	4.5	59.9	7.0	7.0	7.0	4.8			

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
E. W. Bailey & Co.											
Bailey's Pennant Brand Breeder Mash	9.0	18.0	4.9	3.0	49.9	7.0	6.9	7.8			
Bailey's Pennant Brand Calf Ration	9.8	15.0	3.9	3.0	55.9	8.5	8.4	8.5			
Bailey's Pennant Brand Chick Starter-Broiler	8.3	20.0	5.5	3.0	46.5	7.0	7.6	9.5			
Bailey's Pennant Brand 18% Dairy Ration	{ 7.9	18.0	{ 21.2	3.5	{ 51.9	9.0	{ 7.1	{ 9.0			
	{ 7.9	20.0	{ 20.0	3.5	{ 52.7	8.2	{ 8.2	{ 6.2			
Bailey's Pennant Brand Fitting Ration	{ 8.6	14.0	{ 4.9	3.5	{ 53.1	11.0	{ 11.1	{ 6.0			
	{ 8.6	14.0	{ 4.7	3.5	{ 55.5	11.0	{ 10.4	{ 6.0			
Bailey's Pennant Brand Horse Feed	10.0	10.5	3.7	3.0	61.0	8.3	8.3	5.7			
Bailey's Pennant Brand Laying Mash	8.2	20.0	4.8	3.0	49.6	7.5	7.5	7.8			
Bailey's Pennant Brand Pig Feed	9.5	17.0	4.2	3.0	52.5	7.8	7.8	7.9			
Barber & Bennett, Inc.											
Ace Dairy Ration	7.6	18.0	5.0	4.0	54.9	10.0	6.2	6.0			
Fort Orange 12% Fitting and Calf Grain Ration	8.2	12.0	5.0	4.0	55.9	8.5	10.1	7.3			
Distillers Dried Grains	2.5	24.0	10.4	5.0	43.5	14.0	13.0	1.9			
Bay State Milling Co.											
Wingold Pure Hard Wheat Bran	9.8	14.5	5.2	4.5	51.1	12.0	10.5	6.9			
Beacon Milling Co., Inc.											
Auburn "18"	9.1	21.3	4.2	3.25	50.8	10.0	7.2	7.4			
Beacon "20"	9.5	20.0	4.5	3.5	51.3	9.0	7.3	6.2			
Beacon Battery Broiler Pellets	9.1	21.0	4.8	3.0	51.3	7.0	5.5	8.3			
Beacon Battery Growing Ration	7.6	16.4	4.5	3.5	55.5	7.5	7.7	9.3			
Beacon Battery Laying Ration (with charcoal)	7.5	17.0	4.8	3.5	54.1	7.5	7.3	8.3			
Beacon Broiler Feed	7.1	15.0	4.4	3.0	52.5	7.0	5.3	7.0			
Beacon Calf Grain	9.3	20.0	4.9	4.0	54.9	8.7	8.7	7.5			
Beacon Calf Starter	9.4	14.0	4.5	4.0	54.9	10.0	6.3	7.0			
Beacon Complete Starting Ration	{ 8.7	19.0	{ 5.0	3.5	{ 49.6	6.5	{ 5.9	{ 8.3			
	{ 8.5	22.1	{ 5.1	3.5	{ 50.4	6.5	{ 5.9	{ 7.8			
Beacon Duck Grower	9.8	22.3	5.1	3.5	49.9	6.5	5.9	8.3			
Beacon "22" Egg Mash	{ 8.8	18.2	{ 4.9	3.0	{ 51.7	6.0	{ 6.7	{ 8.7			
	{ 7.6	24.2	{ 5.0	3.5	{ 44.8	7.0	{ 8.0	{ 10.3			
	{ 8.8	24.2	{ 5.0	3.5	{ 44.2	7.5	{ 8.0	{ 11.0			
	{ 8.8	15.1	{ 4.4	3.5	{ 54.0	8.0	{ 8.9	{ 7.9			
	{ 9.8	14.0	{ 4.3	3.5	{ 55.0	8.0	{ 7.7	{ 8.0			
Beacon Fitting Ration	9.2	14.0	4.2	3.5	55.0	8.0	8.0	7.1			

Beacon Fleshing Pellets	8.5	21.1	20.0	6.7	3.5	47.7	6.8	7.5	9.2
Beacon Goat Ration	9.7	18.6	16.0	4.1	3.5	54.4	7.3	10.0	5.9
Beacon Growing Mash	16.7	19.7	18.0	4.8	3.5	52.0	7.4	7.5	9.4
	18.2	20.2	18.0	5.2	3.5	49.2	6.3	7.5	10.9
Beacon Test Cow Ration	9.4	18.3	16.0	4.4	4.0	53.5	8.5	9.0	5.9
Beacon Turkey & Game Bird Fitting Ration	8.2	13.5	10.0	3.9	3.0	63.5	7.1	9.0	3.8
Be-Co-Lass	10.2	11.6	11.0	2.8	1.0	54.8	13.0	16.0	7.6
Blatchley & Ballard, Inc.									
Bee Brand All Purpose Mash	8.5	16.9	15.0	5.2	3.0	55.2	8.0	8.0	6.2
Bee Brand Dairy Ration 16%	8.6	17.2	16.0	5.4	4.0	50.9	9.8	12.0	8.1
Bee Brand 85% Horse Feed	10.6	11.0	10.0	3.9	3.5	65.0	6.7	9.0	2.8
Borden Grain Co.									
Borden's Dairy Feed	8.0	21.1	18.0	4.9	4.0	50.0	8.2	10.0	7.8
Borden's Laying Mash	7.9	19.4	18.0	6.0	4.0	48.7	7.7	7.0	10.3
George B. Brown Corporation									
Brown's Egg Mash	7.9	18.0	17.0	5.5	5.0	52.0	7.0	10.0	9.6
Brown's Growing Mash	8.4	16.8	15.0	5.5	5.0	53.9	6.5	10.0	8.9
S. J. Cherry & Sons, Ltd.									
Wheat Bran	8.6	17.5	14.0	5.7	3.5	51.0	11.2	11.5	6.0
Commander-Larabee Milling Co.									
Sunfed Wheat Bran with Ground Screenings not exceeding mill run	9.5	16.3	14.0	5.6	4.0	52.5	9.6	12.0	6.5
Sunfed Wheat Standard Middlings with Ground Screenings not exceeding mill run	9.1	16.9	15.0	5.0	4.0	59.4	5.8	9.5	3.8
Community Service, Inc.									
Community Complete Pig Feed	8.5	15.6	14.0	4.1	3.5	56.2	8.0	8.0	7.6
Community 18% Dairy Ration	7.8	19.2	18.0	4.1	4.0	53.4	8.7	10.0	6.8
Community 16% Dairy Ration	8.3	18.2	16.0	4.1	3.5	53.7	10.5	11.0	5.2
Community Fitting Ration	8.0	16.5	14.0	4.5	3.5	56.5	8.8	8.5	5.7
Community Growing Mash	7.7	19.9	18.0	4.6	4.0	49.5	7.8	6.5	10.5
Community Laying Mash	6.9	19.7	18.0	4.0	4.0	51.3	7.6	6.5	10.5
Community Starter & Grower Mash	8.3	20.0	17.0	5.0	4.0	51.6	7.1	6.5	8.0
Consolidated Rendering Co.									
Corenco Fish Meal	9.5	60.5	58.0	7.7	5.0	—	—	—	20.6
Corenco 50% Meat & Bone Scrap	5.9	49.2	50.0	13.0	6.0	—	—	—	30.5
Corenco 45% Meat & Bone Scrap	{ 4.5	46.3	45.0	12.2	6.0	—	—	—	34.8
		46.3	45.0	12.0	6.0	—	—	—	31.4
O. A. Cooper Co.									
Cooper's Best All-Mash Starter	{ 8.7	14.8	15.0	2.9	3.5	55.3	8.7	7.5	9.6
	{ 8.8	14.5	15.0	3.5	3.5	55.0	8.7	7.5	9.5

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Corn Products Sales Co.											
Buffalo Corn Gluten Feed	{ 10.3 9.7 9.0 9.4 9.2	23.0	2.4	2.0	49.7	8.5	8.0	8.5	5.3		
Diamond Corn Gluten Meal		26.8	2.8	2.0	48.1	7.5	7.5	8.5	5.1		
		24.8	2.5	2.0	51.2	8.5	7.8	8.5	4.7		
		40.8	2.9	2.0	49.4	8.5	8.0	8.5	5.5		
			2.5	1.0	44.9	6.0	1.6	6.0	1.0		
Courcy & Sons Grain Co.											
Courcy's Dairy Feed	8.8	19.0	4.2	4.0	52.5	7.0	7.9	7.0	8.3		
Courcy's Laying Mash	7.9	17.0	5.3	4.0	51.6	6.0	6.9	6.0	9.7		
Corn Meal	11.1	—	4.1	—	71.6	—	2.2	—	2.3		
Cover Grain & Feed Co.											
C & P Growing Mash	8.2	17.2	3.9	3.0	54.2	5.9	5.9	7.0	10.6		
C & P Pig & Hog Feed	8.2	14.0	3.3	4.0	57.8	8.1	8.1	11.0	8.6		
C & P Starter & Broiler Ration	8.5	17.6	4.5	4.0	52.6	6.6	6.6	6.0	10.2		
Chas. M. Cox Co.											
Wirthmore Breeder Mash	9.0	20.7	4.7	3.0	49.3	6.6	6.6	7.0	9.7		
Wirthmore Cali Starter Meal	9.3	23.2	3.8	3.5	51.0	6.8	6.8	6.0	5.3		
Wirthmore Calving Ration	10.3	16.7	4.1	4.0	51.3	9.8	9.8	10.0	7.8		
Wirthmore Chick Scratch	10.8	11.7	3.7	2.5	69.0	1.8	1.8	3.5	2.4		
Wirthmore Complete Breeder Ration	{ 9.9 10.6	15.9	3.6	3.0	57.8	5.7	5.7	6.0	6.4		
	{ 9.9 10.2	15.4	4.1	3.0	57.8	6.6	6.6	6.0	6.2		
Wirthmore Complete Egg Ration	{ 7.7 8.8	15.3	4.0	3.0	60.2	5.2	5.2	6.0	5.1		
Wirthmore Complete Growing Ration	{ 8.5 9.3	15.0	4.5	3.0	57.6	5.7	5.7	7.0	7.9		
	{ 9.3 10.9	15.2	4.3	3.0	55.1	7.4	7.4	7.0	7.0		
Wirthmore 20 Dairy Ration	{ 8.5 9.3	20.8	3.7	3.5	59.2	5.5	5.5	7.0	7.3		
Wirthmore 14% Fitting Ration	{ 9.2 9.2	15.9	4.0	4.0	51.8	8.0	8.0	8.0	7.4		
Wirthmore Growing Mash	{ 8.1 8.1	14.0	4.0	3.0	56.9	6.8	6.8	8.0	5.5		
Wirthmore Laying Mash	{ 9.6 9.6	17.5	4.0	3.0	52.9	6.2	6.2	7.0	9.0		
Wirthmore Pig and Hog Feed	{ 10.4 10.4	20.4	4.6	3.0	52.0	6.1	6.1	7.0	8.5		
Wirthmore Rabbit Pellets	{ 9.6 9.8	17.0	4.6	3.0	50.3	7.3	7.3	9.0	10.7		
Wirthmore 16 Record Ration	{ 9.6 10.3	14.0	3.9	3.0	52.3	9.3	9.3	15.0	7.4		
Wirthmore 16 Record Ration	{ 9.5 11.0	16.0	3.6	3.5	55.8	8.6	8.6	8.0	9.5		
Wirthmore Scratch Feed	{ 8.7 8.9	10.6	2.5	2.5	70.9	3.1	3.1	4.0	1.9		
Wirthmore Standard 16 Dairy Ration	{ 16.4 17.1	16.0	4.0	3.0	53.4	9.6	9.6	10.0	7.9		
	{ 8.9	16.0	3.9	3.0	56.2	7.6	7.6	10.0	6.3		

Wirthmore Standard Horse Feed	10.8	11.5	10.0	4.4	3.25	61.1	7.7	9.0	4.5
Wirthmore Starter and Broiler Ration	9.9	20.5	20.0	4.7	3.0	53.7	5.9	6.5	5.3
Wirthmore Stock Feed	{ 10.2	11.6	10.0	3.9	3.0	59.1	9.8	11.0	6.2
	{ 7.1	12.3	10.0	4.4	3.0	7.7	6.1	7.0	7.7
Wirthmore Turkey Breeder Pellets	{ 7.4	24.0	24.0	4.2	3.0	47.5	6.0	7.0	10.8
	{ 10.0	16.8	16.0	4.1	3.0	56.0	7.1	7.0	7.1
Wirthmore Turkey Fattening Ration	{ 7.8	17.8	16.0	4.5	3.0	56.1	6.8	7.0	7.0
	{ 7.6	17.6	16.0	3.9	3.0	58.6	5.4	7.0	6.9
	{ 8.8	17.9	16.0	3.8	3.0	56.6	5.8	7.0	7.1
	{ 5.8	21.6	20.0	4.1	3.0	53.2	6.4	7.0	8.9
Wirthmore Turkey Growing Ration	{ 7.0	22.3	20.0	4.8	3.0	51.3	6.2	7.0	8.4
	{ 8.3	20.4	20.0	4.2	3.0	53.2	6.9	7.0	8.4
Wirthmore Turkey Starting Ration	8.3	24.2	25.0	4.0	3.0	50.4	6.4	7.0	6.7
Wirthmore Twin-Mix Calf Ration	8.3	17.2	16.0	5.3	4.0	54.9	7.8	7.0	6.5
Cunningham Crimped Oats	7.5	13.1	—	5.6	—	60.9	10.0	—	2.9
Crawford Brothers, Inc.									
Crawford Complete Egg Mash	{ 9.0	14.9	15.0	4.2	3.0	57.0	7.5	8.0	7.4
	{ 9.8	16.2	15.0	4.5	3.0	54.4	7.6	8.0	7.6
Crawford Complete Growing Mash	8.4	15.9	15.0	5.1	3.5	56.0	8.0	8.0	6.6
Crawford Producer 20%	8.6	23.6	20.0	4.1	3.5	48.3	7.2	12.0	8.2
Crawford Rabbit Pellets	9.3	17.8	16.0	4.8	3.0	51.6	8.6	8.0	7.9
Crawford Special Test 18%	9.3	20.1	18.0	4.5	4.0	50.5	8.2	10.0	7.4
Star Complete Egg Mash	9.1	15.0	15.0	4.3	3.0	55.2	8.8	10.0	7.6
Star Complete Growing Mash	9.4	15.0	15.0	4.5	3.0	56.2	9.0	10.0	5.9
Curley Grain & Fuel Co.									
Crystal Complete Laying Mash	{ 8.2	17.8	16.0	4.9	4.0	53.3	7.4	6.0	8.4
	{ 9.2	18.3	16.0	4.5	4.0	51.7	7.4	6.0	8.9
	{ 8.1	21.1	20.0	4.5	4.0	49.3	7.9	13.0	9.1
Crystal Dairy Ration 20%	{ 7.9	22.6	20.0	4.0	4.0	49.2	7.4	13.0	8.9
	{ 9.6	22.4	20.0	4.1	4.0	47.5	7.6	13.0	8.8
Datley Mills, Inc.									
Double Diamond All Mash Grower	{ 9.5	17.8	15.0	4.1	3.5	53.4	7.6	7.0	7.6
	{ 8.9	15.6	15.0	5.0	3.5	54.5	7.4	7.0	8.6
Double Diamond Body Builder	{ 10.3	11.8	12.0	3.8	4.0	60.3	6.8	7.0	7.0
	{ 10.0	13.5	12.0	4.0	4.0	58.7	6.7	7.0	6.5
Double Diamond Broiler	9.6	17.6	18.0	4.3	3.5	54.6	7.2	7.0	6.7
Double Diamond Complete Egg Producer	{ 8.8	15.3	15.0	4.8	3.0	52.8	9.4	8.0	8.9
	{ 8.6	16.2	15.0	5.0	3.0	56.5	5.7	8.0	8.0
	{ 8.5	20.2	18.0	4.3	3.5	52.1	6.9	7.0	8.0
Double Diamond Egg Producer	{ 8.8	19.5	18.0	4.7	3.5	52.0	5.7	7.0	9.3
	{ 9.2	19.6	18.0	4.6	3.5	51.7	5.8	7.0	9.1
Double Diamond Horse Feed	{ 11.6	10.8	10.0	3.4	3.0	58.9	8.0	8.0	7.3
	{ 7.4	11.3	10.0	3.4	3.0	61.9	7.3	8.0	8.7
Double Diamond Layer	8.8	21.0	20.0	4.4	3.5	49.6	8.0	7.0	8.2

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Dailey Mills Inc. (Continued)											
Double Diamond 20% Milk Producer	6.6	20.0	5.1	4.0	48.6	10.0	9.4	9.4	9.1	10.0	9.4
Double Diamond 16% Money Maker	7.9	16.0	4.9	3.5	48.5	12.0	12.7	12.0	12.7	12.0	9.3
	{ 9.0	13.9	5.0	3.0	51.9	10.0	11.2	10.0	11.2	10.0	9.0
	{ 8.7	16.3	4.7	3.0	53.4	10.0	8.5	10.0	8.5	10.0	8.4
Double Diamond Pig & Hog Ration	{ 6.9	14.8	5.2	3.0	52.4	10.0	10.8	10.0	10.8	10.0	9.9
	{ 9.0	13.4	3.9	2.0	58.2	12.0	9.4	12.0	9.4	12.0	6.1
Double Diamond Rabbit Pellets			4.2	3.5	53.2	7.0	6.6	7.0	6.6	7.0	7.8
Double Diamond Range Grower	8.9	16.0	4.4	3.5	59.0	4.0	5.1	4.0	5.1	4.0	4.6
Double Diamond Revitalizer	11.2	13.0	2.3	3.0	69.6	4.0	4.0	4.0	4.0	4.0	1.8
Double Diamond Scratch Grain			4.5	3.5	52.5	7.0	6.8	7.0	6.8	7.0	7.1
Double Diamond Starter Broiler	{ 8.8	20.5	3.1	4.0	47.9	9.0	9.4	9.0	9.4	9.0	10.5
Double Diamond 20% Test Ration	{ 9.4	20.3	3.7	4.0	48.2	9.0	8.8	9.0	8.8	9.0	9.7
	{ 9.9	20.2	3.9	4.0	52.4	9.0	8.6	9.0	8.6	9.0	8.6
Double Diamond 16% Test Ration	{ 9.1	17.7	4.2	4.0	52.3	9.0	8.0	9.0	8.0	9.0	8.7
Davis Feed Co.											
Davis Scratch Feed	11.1	10.9	2.5	2.5	68.4	4.0	4.8	4.0	4.8	4.0	2.3
Delaware Mills, Inc.											
Delaware Egg Mash	7.4	19.7	5.0	3.0	50.1	9.0	9.6	9.0	9.6	9.0	8.2
Delaware Emergency Laying Mash	8.9	16.6	4.8	3.0	53.6	8.0	9.0	8.0	9.0	8.0	7.1
Delaware Laying Mash	8.8	20.0	4.8	3.0	52.6	8.0	6.6	8.0	6.6	8.0	7.2
Delaware Sweet 16% Dairy Feed	8.1	16.3	4.0	3.5	52.3	12.0	11.7	12.0	11.7	12.0	7.0
Frank Dianto											
Dianto's Special Egg Mash	8.9	18.5	5.5	4.0	52.4	7.0	6.4	7.0	6.4	7.0	8.3
F. Diehl & Son, Inc.											
Diehl's Dairy Feed	8.4	19.2	4.6	3.0	52.8	12.0	8.3	12.0	8.3	12.0	6.7
Diehl's Dry Mash	8.6	20.1	4.8	3.0	49.7	8.0	7.4	8.0	7.4	8.0	9.4
Diehl's Fitting Ration	8.0	15.9	3.5	3.0	55.6	10.0	10.3	10.0	10.3	10.0	6.7
Diehl's Growing Feed	8.7	17.0	5.0	3.0	49.7	8.0	7.7	8.0	7.7	8.0	9.4
Diehl's Starter Mash	8.9	18.3	4.6	3.0	50.8	8.0	7.5	8.0	7.5	8.0	9.9
Dietrich & Gambrell, Inc.											
D. & G. Flething Pellets	8.1	18.0	5.7	3.5	55.5	6.5	6.4	6.5	6.4	6.5	6.3
D. & G. Pig & Hog Meal	7.9	18.0	6.0	3.5	51.6	8.0	7.4	8.0	7.4	8.0	7.4
Frederick 16% Dairy Feed	16.7	16.0	4.0	3.5	52.0	12.0	10.3	12.0	10.3	12.0	7.4
Frederick Laying Mash	7.8	19.6	4.5	3.5	54.0	9.0	7.0	9.0	7.0	9.0	7.1

INSPECTION OF COMMERCIAL FEEDSTUFFS

Gambrill's Chick Starter	8.2	19.3	18.0	4.8	3.5	54.3	5.2	6.0	8.2
Gambrill's Growing Mash	7.9	20.9	18.0	4.9	3.5	49.3	7.1	8.0	10.2
Gambrill's Laying Mash	8.7	22.4	20.0	4.3	3.5	48.0	6.5	8.0	10.1
Pen Mar 20% Dairy	9.7	20.2	20.0	4.5	3.5	50.2	7.9	10.0	7.5
Pen Mar Stock Feed	10.5	10.8	10.0	4.3	3.0	66.3	5.3	12.0	2.8
J. L. Dunnell & Son									
Excel 20% Dairy Ration	8.3	21.4	20.0	5.4	4.5	49.0	8.3	9.0	7.6
Excel Fitting Ration	8.6	17.1	14.0	5.6	5.0	53.9	8.4	10.0	6.4
Excel Laying Mash	9.5	19.7	19.0	4.7	4.5	52.3	7.2	6.0	8.6
Horse Feed	10.0	11.1	11.0	4.4	3.5	62.8	7.2	8.0	4.5
Starter and Grower—Horners'	9.5	18.8	18.0	5.0	4.5	54.0	5.0	6.0	7.7
Eagle Roller Mill Co.									
Eagle Wheat Bran with Screenings	8.9	16.6	14.0	5.6	4.0	49.6	11.6	12.0	7.7
East Longmeadow Grain Store									
Blue Ribbon All-Mash Layer	8.5	18.2	15.5	5.3	4.0	52.9	6.0	6.5	9.1
Blue Ribbon Chick Starter & Broiler Mash	8.0	21.3	20.0	5.5	4.0	49.9	6.1	6.5	9.2
Blue Ribbon Dairy Feed	8.5	20.1	20.0	4.8	3.5	50.7	7.7	7.0	8.2
Blue Ribbon Dry & Freshening Feed	9.9	15.3	12.0	4.6	3.5	55.7	7.3	8.0	7.2
Blue Ribbon Pig & Hog Feed	8.6	18.7	17.0	5.8	3.5	52.8	5.7	9.0	8.4
Eastern States Farmers' Exchange, Inc.									
Eastern States All-Mash Developer	9.2	15.0	14.5	4.5	2.5	56.9	7.7	10.0	6.7
Eastern States All-Mash Egg	9.0	16.0	14.5	3.4	2.0	56.0	5.9	7.0	9.7
Eastern States All-Mash Egg	8.9	16.6	15.5	4.4	2.0	56.7	6.6	7.0	7.2
Eastern States All-Mash Egg	7.9	17.1	15.5	3.9	3.0	54.2	5.6	7.0	10.4
Eastern States Calf Starter	8.7	22.1	23.0	3.7	3.0	55.5	5.8	7.0	9.8
Eastern States Calving Ration	9.6	12.4	10.0	2.2	1.5	49.7	6.5	7.5	9.3
Eastern States Developer	8.1	18.6	18.0	4.2	2.0	52.4	14.1	18.0	9.3
Eastern States Egg Mash	8.7	19.3	18.0	4.1	2.0	53.7	6.9	10.0	8.5
Eastern States Fitting Ration	8.4	21.2	18.0	3.9	2.0	50.9	6.5	7.5	10.5
Eastern States Flushing	9.5	13.9	12.0	4.4	3.0	51.2	6.0	7.5	9.3
Eastern States Fulpal	8.2	18.8	18.5	2.9	1.5	56.1	9.5	12.0	6.6
Eastern States Horse Feed	8.4	22.0	20.0	4.9	4.0	55.4	4.5	5.0	10.2
Eastern States Milkmore 16	9.4	13.7	10.5	4.3	3.0	51.9	7.0	8.5	5.8
Eastern States Pig Starter & Breeder	9.8	18.8	16.0	4.7	4.0	56.9	9.9	12.0	5.8
Eastern States Pork Builder	9.2	18.0	16.0	5.0	4.0	52.6	7.2	9.0	6.9
Eastern States Pork Builder	9.6	18.3	18.0	4.2	2.0	54.8	6.9	9.0	6.1
Eastern States Pork Builder	9.1	17.8	14.0	3.6	2.0	54.6	6.7	9.0	6.6
Eastern States Pork Builder	9.1	17.8	14.0	3.6	2.0	57.0	6.4	9.0	6.1

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
		Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Eastern States Farmers' Exchange, Inc. (Continued)									
Eastern States Pork Builder	{ 10.3	15.9	15.0	4.3	3.0	58.4	4.7	8.0	6.4
Eastern States Scratch Grains	{ 10.4	16.0	15.0	4.2	3.0	58.3	4.7	8.0	6.4
Eastern States Sheey and Goat	{ 9.0	10.9	10.0	3.5	2.0	60.6	6.4	6.5	2.2
Eastern States Sixteen	{ 8.9	18.6	16.0	4.1	3.0	54.6	7.1	8.0	6.9
Eastern States Starting & Broiler	{ 8.7	18.8	16.0	5.0	3.5	54.1	7.9	9.5	5.3
Eastern States Starting & Broiler	{ 8.4	19.1	16.0	5.0	3.5	53.9	7.9	9.5	5.4
Eastern States Starting & Broiler	{ 8.4	21.2	18.0	4.8	2.5	50.7	7.3	7.5	7.6
Eastern States Stock Feed	{ 9.1	21.1	20.0	4.1	3.0	54.1	5.1	7.0	6.5
Eastern States Stock Feed	{ 9.1	10.9	9.0	4.3	1.5	62.6	6.8	12.0	6.5
Eastern States Stock Feed	{ 9.6	12.8	10.0	4.4	3.0	59.1	7.9	9.5	6.2
Eastern States Stock Feed	{ 10.6	14.0	12.0	4.2	3.0	60.9	5.3	6.5	5.0
Eastern States Turkey Grower	{ 8.8	20.2	18.0	4.0	2.0	52.1	7.3	7.5	7.6
Eastern States Ground Oats	{ 9.3	11.8	—	4.9	—	59.5	11.1	—	3.4
B. A. Eckhart Milling Co.									
Standard Wheat Middlings with ground reekanned wheat screenings	9.7	14.8	15.0	4.4	4.0	61.1	5.9	9.5	4.1
Elmore Milling Co., Inc.									
Elmore Chixsaver	8.7	21.3	20.0	4.8	4.0	46.9	7.7	7.0	10.6
Elmore Complete Broiler Ration	{ 6.8	19.2	18.0	4.8	3.5	51.9	8.0	8.0	9.3
Elmore Complete Growing Ration	{ 6.9	16.2	15.0	4.1	3.5	56.0	8.0	7.0	8.8
Elmore Complete Layer and Breeder	{ 7.7	16.3	15.0	4.1	3.5	52.8	8.5	8.0	9.5
Elmore Complete Market Egg Mash	{ 10.0	19.0	15.0	4.6	3.5	49.3	8.5	8.0	10.9
Elmore Fitting Ration	{ 9.1	18.1	15.0	4.1	3.5	53.6	5.7	8.0	8.5
Elmore Fleshing Pellets	{ 6.5	17.9	14.0	4.8	4.0	53.3	8.5	10.0	6.4
Elmore Goat Ration	{ 8.5	20.8	15.0	4.2	3.0	50.4	8.1	8.0	10.0
Elmore Horse Feed	{ 10.7	15.9	16.0	3.8	4.0	59.9	8.1	10.0	4.0
Elmore M. A. C. Laying Mash	{ 11.9	12.2	9.0	3.5	2.5	63.2	7.5	11.0	2.9
Elmore Milk Grains Sixteen	{ 8.3	11.9	9.0	4.3	2.5	63.1	6.3	11.0	2.5
Elmore Rabbit Ration	{ 11.3	20.3	18.0	4.5	3.5	48.4	7.3	8.0	10.7
Elmore Scratch Feed	{ 7.2	20.2	18.0	4.7	3.5	51.0	6.9	8.0	7.0
Elmore Test Ration	{ 9.1	19.3	16.0	4.3	4.0	50.6	7.5	10.0	7.4
Elmore Test Ration	{ 8.7	10.2	10.0	4.2	2.5	51.3	10.8	10.0	7.4
Elmore Test Ration	{ 8.7	20.8	18.0	5.0	4.0	71.7	3.7	7.0	1.8
Elmore Test Ration	{ 8.7	20.8	18.0	5.0	4.0	52.1	7.5	10.0	5.9

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Flory Milling Co., Inc.											
Floco 16% Dairy Feed	9.5	16.0	17.3	16.0	4.6	3.0	51.6	11.0	8.4	11.0	8.6
Floco Turkey All Ase Pellets	7.8	18.0	17.2	18.0	3.7	3.0	55.6	8.0	6.6	8.0	9.1
Flory All-Mash Layer	8.6	15.5	17.6	15.5	3.5	3.5	54.0	7.5	6.3	7.5	10.0
Flory 16% Dairy Feed	9.0	16.0	16.8	16.0	4.2	3.0	53.1	8.3	8.3	10.0	8.6
Flory Dry Cali Starter	8.3	18.0	19.9	18.0	4.1	3.5	53.8	7.5	7.5	7.5	6.4
Flory Fattener & Flesher Pellets	8.9	14.0	16.3	14.0	3.7	3.5	58.8	8.0	6.5	8.0	5.8
Flory Hog Feed	8.7	16.0	17.1	16.0	5.1	3.5	52.6	9.0	7.5	9.0	9.0
Flory Laying Mash	{ 8.2	19.0	19.0	19.0	5.1	3.5	50.4	6.9	6.9	7.5	9.6
Flory Rabbit Pellets	6.9	15.0	17.7	15.0	3.0	2.5	56.6	7.4	7.4	9.0	8.4
Flory Starter Mash	8.5	18.0	18.6	18.0	4.7	4.0	52.4	7.5	5.7	7.5	10.1
Fred A. Fountain											
Fountain's Breeder Mash	8.3	18.0	18.1	18.0	5.7	4.0	50.2	7.0	7.1	7.0	10.6
Fountain's Growing Mash	8.5	16.0	17.4	16.0	5.4	3.5	51.1	7.0	7.0	7.0	10.6
Fountain's Laying Mash	7.9	18.0	17.3	18.0	4.9	4.0	53.0	6.6	6.6	7.0	10.3
Fountain's Starting & Broiler Ration	7.4	17.5	23.6	17.5	5.2	4.0	46.4	7.0	6.5	7.0	10.9
J. B. Garland & Son, Inc.											
Garland 16% Dairy Ration	8.9	16.0	16.2	16.0	3.7	3.0	55.4	9.0	9.1	9.0	6.7
Garland Fitting Ration	9.2	12.0	3.2	12.0	3.9	3.0	57.5	7.0	6.9	7.0	6.3
Garland Growing Mash	7.9	14.0	18.1	14.0	4.1	3.0	53.3	7.0	8.2	7.0	8.4
Garland Horse Feed	{ 10.2	10.0	10.4	10.0	3.5	3.0	63.4	9.0	8.4	9.0	4.1
Garland Laying Mash	{ 7.8	18.0	19.8	18.0	4.7	3.0	63.6	7.4	7.4	9.0	4.2
Garland Pig & Hog Ration	{ 7.9	17.0	19.9	17.0	4.7	3.0	49.6	8.2	8.2	7.0	9.9
Garland Stock Feed	{ 8.2	18.0	18.0	18.0	4.4	3.5	50.3	8.0	8.2	8.0	9.3
Garland Turkey Starting and Growing Mash	8.0	8.5	11.4	8.5	5.9	3.5	51.2	8.0	9.3	8.0	8.7
Gateway Milling Association, Inc.											
Gateway 18% Dairy Feed	8.9	18.0	19.5	18.0	4.2	3.0	48.8	12.0	10.6	12.0	8.0
Gateway Fitting Ration	9.9	14.0	4.3	14.0	4.3	3.0	57.0	7.6	7.6	8.5	6.0
Gateway Star 16% Dairy Feed	9.3	16.0	17.3	16.0	4.5	3.0	49.0	11.4	11.4	12.0	8.5
Gateway Starting & Growing Mash	9.2	15.0	18.5	15.0	4.6	3.0	53.3	8.1	8.1	6.0	6.3
General Mills, Inc. Farm Service Division											
Farm Service 14% Fitting Ration	7.8	14.0	16.6	14.0	6.2	4.0	52.3	10.0	10.4	10.0	6.7
Farm Service Goat Ration	9.5	15.0	16.0	15.0	4.4	3.5	55.8	10.0	8.5	10.0	5.8

Farm Service Growing Mash	7.4	22.7	18.0	6.5	3.5	47.0	7.4	8.0	9.0
Farm Service Horse Feed	8.6	10.3	9.0	4.2	3.0	63.4	9.4	9.5	4.1
Farm Service Laying Mash	8.9	22.2	20.0	4.5	3.5	48.0	7.7	8.5	8.7
Farm Service Stock Feed	7.3	23.1	20.0	6.4	3.5	47.1	7.3	8.5	8.0
NEC Laying Mash	8.1	10.8	8.5	5.3	3.5	59.8	10.1	12.5	5.4
Vigor 20% Dairy	8.1	18.1	17.0	5.2	3.5	52.7	7.8	8.0	8.1
Vigor Growing Mash	8.2	20.0	20.0	4.6	3.5	49.0	11.4	12.0	6.8
Vigor Hog Feed	7.9	19.1	18.0	4.8	3.0	50.8	8.8	9.0	8.0
Vigor Laying Mash	8.4	19.1	16.0	4.4	3.0	53.7	6.2	7.0	8.0
Ground Oats	7.6	19.3	18.0	4.6	3.0	48.5	10.8	11.0	9.2
	9.2	11.4		5.4		61.2	10.0		2.8
General Mills, Inc., Larrowc Division									
Larrow 18% Broiler Feed	8.0	19.2	18.0	4.6	3.0	52.6	7.5	7.0	8.1
Larrow Calf Builder	8.4	23.5	24.0	4.7	3.5	50.5	5.1	6.5	5.8
Larrow Chick Builder	9.1	19.2	19.0	4.9	3.5	51.6	4.5	6.5	5.3
Larrow 18% Dairy Ration	8.3	20.7	18.0	3.4	3.0	53.5	6.8	7.0	7.4
Larrow 16% Dairy Feed	8.6	19.2	18.0	4.1	3.0	52.0	8.8	12.0	6.8
Larrow 18% Egg Mash (Pellets)	7.1	19.7	16.0	3.9	3.0	54.4	9.2	12.0	6.5
Larrow Poultry Breeder Mash Pellets	7.9	22.5	18.0	3.8	3.0	53.5	6.4	8.0	9.5
Larrow Scratch Feed	9.8	11.4	9.5	4.9	2.0	48.2	7.3	8.0	9.2
Larrow Sow & Pig Builder	9.1	19.0	17.5	4.7	2.0	71.5	2.6	4.0	2.2
Dried Beet Pulp	7.6	10.0	7.0	0.9	3.5	52.0	6.8	8.0	8.7
	9.3	8.4	7.0	0.9	0.3	51.2	21.6	22.5	5.7
	9.6	8.5	7.0	1.0	0.3	58.9	20.0	22.5	2.5
	5.9	8.7	7.0	0.9	0.3	58.1	19.9	22.5	2.9
	8.0	8.1	7.0	1.0	0.3	61.8	20.0	22.5	2.7
						59.3	21.0	22.5	2.6
General Mills, Inc., Purity Oats Division									
Pulverized Oats	4.8	17.1	12.0	6.9	4.5	59.3	8.5	13.0	3.4
	7.1	13.6	12.0	5.8	4.5	56.8	13.0		3.7
Glidden Co., Feed Mill Division									
Glidden All-Mash Layer	10.5	15.6	15.0	3.2	3.0	58.5	6.0	6.0	6.2
Glidden Broiler Ration	8.9	16.6	15.0	4.2	3.0	57.8	5.1	6.0	7.4
Glidden Chick Starter	10.5	21.3	20.0	4.5	3.0	50.3	6.4	7.0	8.0
Glidden 16% Dairy Feed	9.5	22.0	19.0	3.6	3.0	50.4	6.5	7.0	8.0
Glidden Growing Mash	8.6	16.1	16.0	5.0	3.0	54.8	9.0	9.0	6.3
Glidden Laying Mash	10.6	16.9	17.0	3.1	3.0	55.2	6.0	7.0	8.2
	9.3	23.7	20.0	4.2	3.0	46.1	6.6	7.0	10.1
	8.4	22.1	20.0	4.5	3.0	49.7	5.9	7.0	9.4

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract		Fiber		Ash
		Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Glidden Co. Feed Mill Division (Continued)										
Glidden 18% Pig Meal	9.4	20.1	18.0	4.6	3.0	53.0	7.0	6.4	7.0	6.5
Glidden Turkey Finisher Pellets	9.6	17.9	15.0	4.0	3.5	56.7	6.0	5.4	6.0	6.4
Glidden Turkey Grower	9.0	23.5	22.0	3.8	3.0	48.0	7.5	5.8	7.5	9.9
D. H. Grandin Milling Co.										
Grandin's All-Mash Layer	8.1	18.1	15.0	4.8	3.0	52.7	8.0	8.0	8.0	8.3
Grandin's Big 4 Scratch Grains	9.9	10.9	10.0	2.8	2.5	69.3	5.0	4.6	5.0	2.5
Grandin's Breeder Mash	7.1	21.5	20.0	4.8	3.0	47.1	8.0	9.2	8.0	10.3
Grandin's 14 Fitting Ration	9.6	15.6	14.0	4.6	3.5	56.3	10.0	7.7	10.0	6.2
Grandin's Horse Feed	{ 10.5	11.4	9.5	4.6	3.5	60.5	11.0	7.8	11.0	5.2
	{ 11.3	11.4	9.5	3.9	3.5	60.3	8.0	8.0	11.0	5.1
Grandin's Intermediate Chick Grains	10.2	9.8	10.0	3.3	2.5	73.3	5.0	1.9	5.0	1.5
Grandin's Laying Mash	8.1	21.6	20.0	3.7	3.0	49.7	8.0	8.2	8.0	8.7
Grandin's 20 Milk Maker	7.5	22.0	20.0	5.5	3.5	49.8	10.0	8.5	10.0	6.7
Grandin's 18 Milk Maker	7.9	20.0	18.0	5.0	3.5	51.3	9.7	9.7	10.0	6.1
Grandin's 16 Milk Maker	9.0	16.5	16.0	3.8	3.5	55.1	9.0	9.0	10.0	6.6
Grandin's Pig & Hog Ration	8.1	20.1	18.0	4.0	3.5	52.7	6.2	6.2	10.0	8.9
Grandin's Rabbit Pellets	9.2	18.8	17.0	3.6	3.0	51.4	8.5	9.3	10.0	7.7
Grandin's Start-to-Finish Mash	{ 6.6	18.4	18.0	5.6	3.0	50.6	8.0	8.5	8.0	10.3
	{ 9.3	16.6	16.0	3.2	3.0	53.3	8.0	7.0	8.0	8.6
Grandin's Turkey Fattener	7.6	16.9	15.0	4.0	3.5	55.1	8.0	8.8	8.0	8.8
Grandin's Turkey Grower	7.2	20.7	20.0	4.9	3.0	48.8	8.0	7.7	8.0	10.7
Hales & Hunter Co.										
Kingflax Horse Feed	{ 9.7	11.6	9.0	4.4	2.5	61.8	10.0	9.1	10.0	3.4
	{ 8.3	12.8	9.0	4.8	2.5	61.1	10.0	8.2	10.0	4.8
Pioneer 18 Dairy	7.4	21.3	18.0	5.3	3.0	50.9	9.0	6.7	9.0	8.4
Pioneer 14 Dairy	7.9	20.5	14.0	5.2	3.0	52.2	9.0	6.8	9.0	7.4
D. Harbeck & Sons										
Welcome Dairy Feed	8.6	22.5	20.0	4.2	4.0	50.5	10.0	7.6	10.0	6.6
Welcome Growing Mash	8.5	18.6	18.0	5.2	4.0	50.1	7.0	6.8	7.0	10.8
Welcome Starter and Broiler Mash	8.9	21.9	18.0	5.3	4.0	47.9	7.0	6.6	7.0	9.4
Harper Feed Mills, Inc										
Harco 20% Dairy Ration	10.2	20.7	20.0	3.1	3.0	49.3	12.0	8.2	12.0	8.5
Harco Rabbit Feed (Pellets)	9.4	15.7	15.0	3.9	3.0	54.4	12.0	9.6	12.0	7.0

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Mansfield Milling Co.											
Mansfield Chick Growing Mash	{ 8.9	17.0	5.0	4.0	51.5	8.0	7.5	8.0	9.3		
	{ 10.3	17.0	4.9	4.0	52.3	8.0	6.7	8.0	7.7		
Mansfield Chick Starter	{ 9.2	17.0	5.2	3.5	51.6	6.5	7.0	6.5	8.7		
	{ 9.0	17.0	4.9	3.5	49.4	6.5	7.1	6.5	8.9		
Mansfield Dry Poultry Mash	{ 9.4	20.0	5.0	5.0	49.2	7.0	7.4	7.0	9.3		
Miner-Hillard Milling Co.											
Choice Steam Cooked Hominy Feed	8.6	10.0	6.4	5.0	65.7	5.0	5.0	5.0	3.1		
Geo. Q. Moon & Co., Inc.											
Moon's Complete Growing Mash	8.6	16.0	4.6	3.0	51.1	9.0	8.9	9.0	9.6		
Moon's Complete Laying Mash	7.8	16.0	4.9	3.0	50.3	9.0	9.7	9.0	9.2		
Moon's Complete Starter & Broiler Mash	8.6	17.5	3.9	3.0	50.7	9.0	9.4	9.0	9.7		
Moon's Fitting Ration	9.2	13.0	4.4	3.0	54.6	9.0	8.5	9.0	6.8		
Moon's Hog Feed	{ 7.6	17.8	3.4	3.0	51.0	12.0	11.9	12.0	8.0		
	{ 7.9	16.0	4.3	3.0	54.3	12.0	9.5	12.0	8.0		
Moon's 90 Horse Feed with Molasses	9.5	9.0	4.2	3.0	56.6	10.0	10.5	10.0	4.4		
Moon's Scratch Feed	3.3	10.0	2.6	2.0	74.9	5.0	4.3	5.0	2.0		
Moon's Special A Dairy 20% Ration	8.7	21.9	3.9	3.0	47.9	10.0	9.4	10.0	7.7		
	{ 8.7	20.0	5.1	3.0	48.4	10.0	4.8	10.0	7.8		
	{ 8.7	19.2	4.8	3.0	50.7	12.0	10.0	12.0	7.3		
Moon's Special A Dairy 18% Ration	8.4	18.0	4.6	3.0	47.5	12.0	10.1	12.0	8.2		
	{ 8.4	15.6	4.6	3.0	53.4	12.0	10.9	12.0	7.1		
Moon's Special A Dairy 16% Ration	8.8	18.9	4.6	3.0	48.8	10.0	10.9	12.0	8.0		
Moon's Stock Feed	8.4	9.0	4.1	3.0	58.0	12.0	12.7	12.0	6.5		
Moon's Test Ration	9.0	16.0	4.2	3.0	52.7	8.0	7.6	8.0	6.3		
Jas. F. Morse & Co.											
Morse's 45% Meat & Bone Scraps	4.3	45.0	9.3	8.0	—	—	—	—	35.6		
Mount Vernon Milling Co.											
Poco Hominy Feed	7.5	10.0	8.1	7.0	66.5	6.0	4.2	6.0	3.0		
Narragansett Brewing Co.											
Dried Brewer's Grains	6.0	25.0	7.7	5.0	40.5	18.0	13.8	18.0	3.0		
National Distillers Products Corporation											
Nadrisol Brand Distillers Dried Solubles	4.7	25.0	12.8	1.5	43.3	4.0	3.7	4.0	6.8		

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
		Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Park & Pollard Co., Inc. (Continued)									
Park & Pollard All-Mash Laying Ration	9.1	18.3	15.0	4.5	2.5	50.2	7.4	8.5	10.5
Park & Pollard Broiler Mash	8.3	18.6	18.0	4.0	2.5	50.9	8.5	8.5	9.7
Park & Pollard Fishing Pellets	8.0	16.0	15.0	4.6	2.5	53.5	7.2	8.5	10.7
Park & Pollard Growing Feed	{ 7.7	19.5	16.0	4.2	2.5	50.7	7.5	8.5	10.4
	{ 7.9	17.3	16.0	4.2	2.5	52.2	8.4	8.5	10.0
	{ 7.7	20.3	18.0	4.4	2.5	49.8	7.2	8.5	10.6
Park & Pollard Laying Pellets	8.4	17.8	14.0	4.6	2.5	52.6	8.2	8.4	8.4
Park & Pollard Rabbit Pellets	8.6	10.2	9.0	4.0	2.0	60.4	12.3	12.0	4.5
Park & Pollard Stock Feed	10.8	12.6	10.0	4.4	2.5	59.9	6.7	10.0	5.6
Park & Pollard Horse Feed									
George H. Parker Grain Co.									
Parker's Egg Mash	7.7	19.3	18.0	5.2	3.5	49.9	7.3	6.5	10.6
Parker's 18% Growing Mash	7.9	19.1	18.0	5.0	3.5	49.8	7.4	6.5	9.9
Parker's 18% Starter & Broiler Mash	7.5	18.8	18.0	4.9	4.0	50.3	7.8	7.0	10.7
Pasco Packing Co.									
Sugar Sweet Citrus Pulp	4.4	6.8	6.0	4.5	2.75	64.8	12.7	12.0	6.8
Pillsbury Mills, Inc.									
Pillsbury's Hard Wheat Bran with ground wheat screenings not exceeding mill run	9.2	15.5	14.0	5.0	4.0	53.3	10.8	12.0	6.2
R. C. Pratt									
Ruler Brand Pure Wheat Bran	{ 8.4	16.5	15.0	5.0	3.5	53.4	10.7	11.5	6.0
	{ 9.4	17.5	15.0	5.7	3.5	50.6	11.0	11.5	5.8
Ruler Brand Pure Wheat Shorts	10.0	18.8	15.0	6.0	3.5	53.1	7.6	10.5	4.5
Quaker Oats Co.									
Bell Cow Wheat Shorts	9.5	17.7	16.0	5.1	4.0	54.2	8.6	8.0	4.9
Big Egg Chick Starter-Growing Mash	7.0	17.6	17.0	4.9	3.0	54.1	8.2	8.0	8.2
Ful-O-Pep Calf Starter	6.5	21.2	20.0	4.5	4.5	54.3	6.6	8.0	6.9
Ful-O-Pep Chick Starter	8.1	19.0	18.0	5.7	4.0	52.3	7.2	8.0	7.7
Ful-O-Pep Chick Starter	8.4	17.2	17.0	4.9	4.0	57.6	4.6	8.0	7.3
Ful-O-Pep Crate Fattener	7.7	14.4	12.5	4.5	3.0	61.5	6.1	8.0	5.8
Ful-O-Pep 20% Dairy Ration	7.4	19.8	20.0	5.0	3.5	52.6	10.2	11.0	5.0
Ful-O-Pep 16% Dairy Ration	{ 8.4	16.5	16.0	2.5	3.5	55.9	10.7	11.0	6.0
	{ 9.3	16.0	16.0	4.5	3.5	55.3	8.9	11.0	6.0
Ful-O-Pep Fitting Ration	7.9	14.4	14.0	5.0	3.5	57.3	10.6	11.0	4.8
Ful-O-Pep Growing Mash	7.5	20.9	19.0	5.1	4.0	53.1	6.8	8.0	6.6

Ful-O-Pep Horse Feed	12.7	12.0	5.2	3.0	59.9	9.8	11.0	5.2
Ful-O-Pep Laying Mash	18.4	18.0	4.3	3.5	54.2	8.9	8.0	6.8
Ful-O-Pep Pig-Sow Feed	17.7	17.0	5.3	3.5	55.0	7.0	8.0	6.6
	{ 7.5							
Ful-O-Pep Super Greens (Pellets)	18.5	17.0	5.4	3.5	53.9	8.0	8.0	7.7
Ful-O-Pep Turkey Finisher Pellets	19.5	19.0	5.2	4.3	53.9	5.4	8.0	8.5
Peterborough Oat Feed	16.3	15.0	4.6	3.5	56.8	0.0	9.0	6.1
Quaker 20% Protein Dairy Feed	4.0	3.5	1.7	1.0	58.0	31.4	32.5	5.8
Quaker 20% Protein Dairy Feed	19.9	20.0	4.3	3.0	48.7	12.2	12.0	7.2
Quaker Green Cross Horse Feed	15.7	10.0	4.5	2.5	53.6	12.7	12.0	5.6
Quaker Sugared Schumacher Feed	9.4	10.0	2.8	3.0	63.2	11.4	12.0	4.2
	{ 8.0	10.0	4.0	3.0	60.9	11.3	12.0	5.1
Ralston Purina Co.								
Purina B & M Cow Chow	17.0	16.0	3.5	3.5	52.1	10.2	10.0	7.3
Purina Breeder Layena	8.3	15.5	3.9	3.0	56.1	5.9	8.0	9.5
Purina Broiler Chow	{ 7.9	18.0	4.7	3.5	51.2	7.5	7.0	6.5
	{ 8.4	18.0	4.0	3.0	54.0	5.8	7.0	6.4
Purina Bulky Las	10.7	10.0	4.5	2.0	52.4	15.0	16.0	10.6
Purina Calf Startena	{ 8.3	19.5	4.3	2.5	49.8	9.0	9.5	7.2
	{ 9.1	19.5	3.7	2.5	51.1	9.0	9.5	6.4
Purina Chick Growena	8.5	20.0	3.9	3.0	52.8	7.3	7.0	7.5
Purina Chick Growing Chow	7.9	23.0	5.1	3.5	46.1	6.1	8.0	10.5
Purina Chick Startena	11.1	20.0	3.7	3.5	50.0	4.7	7.0	7.5
Purina Chicken Fatena	8.1	14.5	4.6	3.0	63.9	5.6	8.0	3.3
	{ 10.9	18.0	3.8	3.0	48.3	8.7	10.0	7.7
Purina Cow Chow	8.6	18.0	4.0	3.0	49.3	9.9	10.0	7.7
Purina Dry & Freshening Chow	10.9	18.0	4.5	3.0	51.1	9.5	10.0	8.8
Purina Eastern Cow Chow	7.5	12.5	4.7	2.0	54.0	8.2	14.0	8.2
Purina Flushing Mash	8.2	20.0	3.2	3.5	51.2	5.6	12.0	8.3
Purina Fox Checkers	7.8	18.0	5.1	3.0	51.8	5.6	6.0	8.3
Purina Goat Chow	{ 8.7	20.0	4.4	3.0	53.0	4.1	6.0	6.8
	{ 10.9	16.0	4.4	3.5	53.1	5.9	10.0	5.6
Purina Hog Fatena	8.6	16.0	4.4	3.0	57.5	7.6	7.0	5.5
Purina Layena	{ 8.1	14.0	3.9	3.0	52.3	8.9	8.0	9.6
	{ 9.1	15.5	4.2	3.0	53.4	6.2	8.0	9.8
Purina Omolene	9.8	11.4	3.6	3.0	61.4	9.9	11.0	3.9
Purina Rabbit Chow Checkers	7.7	19.0	3.9	2.0	47.0	15.3	18.0	7.1
Purina Rabbit Chow Meal	9.1	16.8	4.8	2.5	52.9	12.4	16.0	5.1
Purina Turkey Breeder Chow	8.9	21.2	3.7	4.0	47.8	6.4	8.0	10.6
Purina Turkey Fatena Checkers	8.1	16.6	3.7	3.5	50.4	6.9	7.0	5.6
Purina Turkey Growena	8.1	22.9	4.1	3.5	51.1	6.2	7.0	7.6
Purina Turkey Layena (Checkers)	9.3	15.0	4.1	3.5	52.2	6.1	8.0	9.9
Purina Turkey Startena	7.4	27.3	4.8	4.0	43.8	6.8	7.0	9.9
John Reardon & Sons Division of Wilson & Co., Inc.								
Register Brand Fish Meal	8.5	60.0	10.8	5.0	—	—	—	21.2

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
D. F. Riley											
Riley's 16% Dairy Ration	9.0	16.0	4.3	4.0	51.4	10.3	7.2	10.0	7.2		
Riley's Growing Mash	10.5	15.0	4.4	4.0	55.9	7.0	6.2	7.0	6.2		
Riley's Laying Mash	10.1	18.0	4.6	4.5	52.6	6.8	8.4	7.0	8.4		
Riley's Scratch Feed	11.3	10.0	2.4	2.0	70.8	3.7	1.7	4.0	1.7		
Rodney Milling Co.											
Heart of America 100% Whole Wheat Ground Wheat Flour	10.6	—	2.0	—	68.3	2.1	1.9	—	1.9		
Russell-Miller Milling Co.											
American Beauty Pure Wheat Bran	8.5	14.0	4.5	3.75	58.1	9.5	6.8	9.5	6.8		
Hard Wheat Occident Bran	10.2	14.0	5.7	4.0	49.1	9.3	6.4	11.5	6.4		
Hard Wheat Occident Standard Middlings with ground wheat screenings	{ 8.9	15.0	5.6	4.0	54.1	8.5	5.3	9.5	5.3		
Hard Wheat Occident Mixed Feed with ground screenings not exceeding mill run	{ 9.7	15.0	4.8	4.0	54.0	8.3	5.2	9.5	5.2		
	{ 9.7	15.0	4.1	4.0	55.3	8.8	5.5	9.5	5.5		
					57.3	7.1	5.1	9.5	5.1		
Ryther & Warren Co.											
Blue Tag Dairy Ration	9.1	17.0	4.2	4.0	52.8	9.2	6.5	10.0	6.5		
Minot Growing Mash	9.7	18.0	4.6	4.0	53.7	6.4	7.4	7.0	7.4		
Minot Milk Eggs Mash	9.1	17.0	4.4	4.0	54.7	6.6	6.9	8.0	6.9		
Schenley Distilleries, Inc.											
Schenley Mark of Merit Corn Distillers Dried Grains with Solubles 24%	2.9	24.0	8.4	5.0	47.2	13.2	2.6	13.0	2.6		
Schenley's Soludri Distillers Solubles Dried 25%	{ 5.5	25.0	6.0	3.0	51.7	3.4	8.3	4.0	8.3		
	{ 8.0	25.6	4.6	3.0	51.1	4.0	6.7	4.0	6.7		
Sherwin-Williams Co.											
S-W Old Process Linseed Meal	7.0	32.0	7.2	4.5	35.8	8.5	5.3	9.0	5.3		
Stafford County Flour Mills Co.											
Wheat Bran and Wheat Screenings	8.3	14.5	4.3	3.5	57.5	8.7	5.5	11.0	5.5		
A. E. Staley Manufacturing Co.											
Staley's Corn Gluten Feed	7.2	23.0	5.6	1.5	48.2	8.2	7.5	8.0	7.5		
Staley's Corn Gluten Meal	7.6	41.0	2.8	1.0	40.6	4.2	4.2	6.0	4.2		
Staley's 41% Protein Soybean Oil Meal	{ 8.0	44.6	4.3	3.5	32.7	5.4	5.0	7.0	5.0		
	{ 9.5	45.0	4.2	3.5	30.7	5.6	5.0	7.0	5.0		

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash	
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed		
Vita-Vim Millers												
Vita-Vim All Mash Breeder Mash	10.2	14.75	4.2	3.8	52.8	7.6	8.75	7.4	8.0	8.75	7.4	
Vita-Vim All Mash Growing Mash	10.0	14.75	4.7	3.5	52.1	8.0	8.75	8.1	8.0	8.75	8.1	
Vita-Vim All Mash Laying Mash	9.5	14.75	4.3	3.5	52.7	8.0	8.65	8.4	6.0	7.85	9.0	
Vita-Vim Broiler Mash	10.0	19.0	4.0	4.0	58.8	4.0	9.8	8.4	3.5	7.95	7.2	
Vita-Vim Cream-O-Fat 18% Dairy Ration	9.7	19.3	4.0	3.5	49.7	7.3	7.95	7.2	5.9	8.75	10.3	
Vita-Vim Original Starting and Growing Mash	9.6	18.0	4.8	3.75	43.4	4.9	8.75	8.9	7.7	8.25	8.9	
Vita-Vim V-10 (Original) Mash	9.3	22.0	4.9	3.25	49.0	4.9	—	—	12.0	—	5.6	
Vita-Vim Worm Control Mash	9.3	20.0	4.9	3.25	49.0	4.9	—	—	7.6	—	6.6	
O. B. Vunck & Son												
18% Cortland Dairy Ration	8.3	18.0	5.8	3.5	48.0	12.0	—	—	7.0	—	3.1	
Cortland Laying Mash	9.0	18.0	5.4	4.0	54.0	8.2	—	—	6.6	—	—	
Fine Ground Corn & Oats	9.5	—	3.3	—	64.6	—	—	—	—	—	—	
C. P. Washburn Co.												
Made Right Complete Broiler Ration	8.5	18.0	4.7	3.5	53.5	6.6	7.0	8.3	7.4	7.0	8.0	
Made Right Laying Mash	7.8	20.0	5.1	3.5	50.8	7.4	7.0	8.0	7.0	7.0	9.5	
Made Right Pig Feed	8.1	16.0	4.8	3.0	51.6	7.0	7.0	8.5	7.7	8.0	8.3	
Made Right Starting Mash	8.1	20.0	4.8	4.0	51.0	4.4	7.7	8.0	12.0	10.0	5.0	
Made Right Sweet Dairy Feed	8.0	20.0	4.4	3.5	49.5	5.1	—	—	6.8	8.0	5.6	
Made Right White Stock Feed	7.0	8.0	5.1	3.5	49.5	5.1	—	—	8.9	7.0	6.3	
Wayne County Grangers Feed Corporation												
Superior Broiler Ration	10.5	18.0	4.4	3.0	54.5	4.4	3.0	8.0	7.1	7.0	5.3	
Superior Complete Growing Mash	8.1	17.5	4.0	3.5	55.2	4.3	3.0	6.1	8.0	7.0	6.1	
Superior Growing Mash	9.5	16.0	4.3	3.5	54.2	4.5	3.5	—	5.3	6.0	8.6	
Superior Hog Ration	8.3	16.0	4.5	3.5	54.2	4.5	3.5	—	6.0	6.0	8.4	
H. K. Webster Co.												
Blue Seal All-Mash Breeder's Ration	9.6	15.0	5.4	3.5	54.3	5.3	6.0	8.6	5.0	6.0	8.4	
	7.9	15.0	5.0	3.5	57.0	5.3	6.0	8.4	5.0	6.0	8.5	
	8.8	16.2	4.7	3.5	56.8	5.7	6.0	7.7	6.0	6.0	8.4	
Blue Seal All-Mash Egg Ration	9.1	15.0	5.3	3.5	56.8	6.8	6.0	8.4	5.9	6.0	8.4	
	8.4	15.3	4.9	3.5	56.2	5.4	3.5	8.6	5.3	6.0	8.9	
	9.3	16.7	5.4	3.5	58.2	5.3	3.5	6.0	4.9	6.0	7.4	
Blue Seal All-Mash Growing Ration	8.4	15.0	5.3	3.5	58.2	4.9	3.5	6.0	5.6	6.0	8.6	
	9.3	14.5	4.9	3.5	55.7	5.5	3.5	6.0	5.6	6.0	7.4	
	8.0	16.8	5.5	3.5	56.7	5.6	6.0	6.0	5.6	6.0	7.4	

Blue Seal Breeder's Mash	8.5	20.0	20.0	6.1	3.5	50.9	5.2	7.0	9.3
Blue Seal Breeder's Mash	7.4	26.0	24.0	5.8	4.0	46.5	5.8	6.5	8.5
Blue Seal Breeder's Mash	8.7	12.9	12.0	3.9	3.0	58.9	8.5	12.0	7.1
Blue Seal Breeder's Mash	8.7	14.0	12.0	4.3	3.0	58.9	8.5	12.0	7.1
Blue Seal Breeder's Mash	9.1	19.1	18.0	4.5	4.0	57.0	4.6	5.5	5.7
Blue Seal Breeder's Mash	7.9	20.1	18.0	4.7	4.0	57.1	4.2	5.5	6.0
Blue Seal Breeder's Mash	8.2	19.6	19.0	4.1	3.5	51.7	7.7	6.5	8.7
Blue Seal Breeder's Mash	7.7	19.9	19.0	5.5	3.5	52.6	6.2	6.5	8.1
Blue Seal Breeder's Mash	9.0	20.5	19.0	5.3	3.5	51.2	6.5	6.5	8.4
Blue Seal Breeder's Mash	7.8	20.8	19.0	5.6	3.5	53.9	5.7	6.5	6.8
Blue Seal Breeder's Mash	8.3	21.1	20.0	5.8	4.0	53.9	7.9	9.0	6.7
Blue Seal Breeder's Mash	9.1	20.6	20.0	5.4	4.0	50.3	7.0	9.0	7.0
Blue Seal Breeder's Mash	9.1	16.6	16.0	4.9	3.5	53.5	9.0	7.2	7.2
Blue Seal Breeder's Mash	7.6	17.3	16.0	5.7	3.5	54.1	8.7	9.0	6.0
Blue Seal Breeder's Mash	7.8	16.0	16.0	5.3	3.5	56.1	8.3	9.0	6.5
Blue Seal Breeder's Mash	7.9	17.7	18.0	4.1	3.5	53.4	6.5	6.5	10.4
Blue Seal Breeder's Mash	8.3	19.2	18.0	5.4	3.5	50.5	6.1	6.5	10.5
Blue Seal Breeder's Mash	7.9	19.6	18.0	5.7	3.5	50.2	6.2	6.5	10.4
Blue Seal Breeder's Mash	9.3	15.0	14.0	5.7	3.5	56.6	7.4	6.5	6.0
Blue Seal Breeder's Mash	8.3	15.4	14.0	4.5	4.0	56.0	8.3	9.0	7.5
Blue Seal Breeder's Mash	7.9	15.7	14.0	5.9	4.0	55.8	9.6	9.0	5.1
Blue Seal Breeder's Mash	10.0	20.2	18.0	5.2	3.5	49.2	6.0	7.0	9.4
Blue Seal Breeder's Mash	7.8	18.0	18.0	3.7	3.5	51.1	6.7	7.0	11.0
Blue Seal Breeder's Mash	9.8	12.6	10.0	4.4	3.0	50.0	9.0	9.0	5.9
Blue Seal Breeder's Mash	9.1	12.4	10.0	4.5	3.0	60.4	7.8	9.0	5.8
Blue Seal Breeder's Mash	8.9	12.5	10.0	4.4	3.0	59.0	8.2	9.0	7.0
Blue Seal Breeder's Mash	8.9	16.6	15.0	5.1	3.0	55.2	5.7	6.0	8.5
Blue Seal Breeder's Mash	9.1	16.3	15.0	5.1	3.0	55.1	5.9	6.0	8.5
Blue Seal Breeder's Mash	8.0	15.7	15.0	5.2	3.0	56.0	7.4	6.0	7.7
Blue Seal Breeder's Mash	9.7	10.5	9.5	3.6	4.0	67.0	6.8	6.5	2.4
Blue Seal Breeder's Mash	8.0	16.6	14.0	4.1	3.0	54.1	10.1	11.0	7.1
Blue Seal Breeder's Mash	8.0	21.6	20.0	5.5	3.5	51.5	7.5	10.0	5.9
Blue Seal Breeder's Mash	7.5	11.0	8.5	4.6	3.0	58.7	12.2	17.0	6.0
Blue Seal Breeder's Mash	8.8	11.1	10.0	3.2	1.5	52.0	17.3	18.0	7.6
Blue Seal Breeder's Mash	9.4	17.1	15.0	5.7	3.5	51.2	7.0	6.0	9.6
Blue Seal Breeder's Mash	8.4	21.0	20.0	4.3	3.5	40.0	7.5	7.0	9.8
Blue Seal Breeder's Mash	8.2	20.2	20.0	5.0	3.5	49.4	7.9	7.0	9.3
Blue Seal Breeder's Mash	11.5	9.4	8.5	4.1	2.5	70.9	2.5	1.6	1.6
Blue Seal Breeder's Mash	12.1	9.0	8.5	3.3	2.5	72.7	1.7	1.2	1.2
Blue Seal Breeder's Mash	10.1	8.8	8.5	3.7	2.5	74.5	1.8	2.5	1.1

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash	
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed		
West-Nesbitt, Inc.												
All Pure Milk Ration	9.6	18.0	19.2	3.5	4.4	3.5	51.9	10.0	9.8	10.0	5.1	
Pure Feed Dairy Ration	8.4	18.0	19.2	3.5	4.1	3.5	51.3	10.0	10.3	10.0	6.7	
Western Condensing Co.												
Peebles Lacto-G Dried Whey	6.5	12.0	13.4	0.5	0.7	0.5	—	—	—	—	11.3	
James Wilson & Sons, Ltd.												
Pulverized Oat Hulls	{ 5.1	4.0	5.4	1.0	2.2	1.0	52.6	30.0	29.0	30.0	5.7	
	{ 6.6	4.0	6.6	1.0	2.8	1.0	54.5	30.0	24.3	30.0	5.2	
Wisconsin Milling, Inc.												
Pulverized Oats	{ 8.3	10.5	11.8	4.0	5.0	4.0	59.4	12.0	12.0	12.0	3.5	
	{ 6.7	10.5	12.6	4.0	4.8	4.0	59.9	12.0	12.0	12.0	4.0	
Stanley Wood Grain Co.												
Bliss Dairy Ration	7.0	20.0	20.2	4.0	4.9	4.0	51.3	10.0	9.2	10.0	7.4	
Preferred Complete Growing Ration	9.8	15.0	15.1	4.0	5.1	4.0	55.2	5.0	9.0	5.0	5.8	
Preferred Complete Laying Mash	6.9	17.3	17.3	4.0	6.3	4.0	52.8	7.0	7.8	7.0	8.9	
Preferred Growing Feed	{ 9.4	18.9	18.9	3.0	5.0	3.0	51.2	7.0	7.5	7.0	8.0	
	{ 9.2	17.5	17.5	3.0	5.0	3.0	50.0	7.0	6.7	7.0	10.5	
Preferred Laying Mash	8.4	18.0	18.5	4.0	5.3	4.0	51.8	8.0	8.0	7.0	8.0	
Preferred Starting Feed	{ 9.4	20.0	19.2	3.0	4.4	3.0	51.8	7.0	7.1	7.0	8.1	
	{ 8.8	22.1	22.1	4.0	5.0	4.0	47.2	7.0	6.8	7.0	9.3	
Wood's Dairy Ration	7.1	16.0	18.2	4.0	5.0	4.0	53.0	10.0	6.6	10.0	7.1	
Wood's Stock Feed	{ 8.1	10.0	15.0	3.0	5.5	3.0	52.9	13.0	11.7	13.0	6.8	
	{ 7.1	10.0	14.7	3.0	6.5	3.0	53.5	13.0	11.2	13.0	7.0	
Worcester Grain & Coal Co.												
Just-Right Laying Mash	8.2	18.0	18.9	3.5	4.6	3.5	50.7	9.0	8.5	9.0	9.1	

Brands Not Conforming to Guarantees

This table includes brands that are one percent or more under guarantee in protein or fat or are one and one-half percent or more over guarantee in fiber.

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
		Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
E. W. Bailey & Co.									
Bailey's Pennant Brand Fitting Ration	8.4	14.1	14.0	4.7	3.0	55.1	10.7	7.5	7.0
Bailey's Pennant Brand Growing Mash	8.1	19.8	18.0	4.8	3.0	51.0	8.8	7.0	7.5
Bailey's Pennant Brand Laying Mash	7.5	20.7	18.0	4.2	3.0	49.4	9.2	7.5	9.0
Courcy & Sons Grain Co.									
Courcy's Growing Mash	8.5	17.9	17.0	4.5	4.0	51.5	7.6	6.0	10.0
Cover Grain & Feed Co.									
C & P Grade A Laying Mash	9.1	17.9	20.0	4.0	3.0	53.0	6.2	7.0	9.8
C & P Own 20 Dairy Ration	8.5	18.9	20.0	3.4	4.0	52.3	8.5	9.0	8.4
Chas. M. Cox Co.									
Wirthmore Poultry Flush	7.6	19.0	15.0	4.0	3.0	51.5	8.4	6.0	9.5
Curley Grain & Fuel Co.									
Crystal Complete Growing Mash	8.7	17.0	15.0	4.7	4.0	53.6	7.5	6.0	8.5
Crystal Growing Mash	8.1	16.2	15.0	4.9	4.0	51.6	7.7	6.0	8.5
Crystal Growing Mash	12.1	16.6	15.0	4.5	4.0	51.2	7.8	6.0	7.8
Crystal Growing Mash	7.8	16.0	16.0	4.4	4.0	52.1	9.3	7.0	10.4
Crystal Growing Mash	7.6	19.8	16.0	5.3	4.0	48.9	8.8	7.0	9.6
Crystal Laying Mash	8.3	19.4	19.0	5.3	3.5	49.5	7.8	6.0	9.7
Crystal Starter and Broiler	7.2	20.7	19.0	6.0	3.5	48.7	8.1	6.0	9.3
Crystal Starter and Broiler	10.7	18.6	19.0	5.3	3.5	47.7	8.7	6.0	9.0
Crystal Starter and Broiler	8.0	18.2	18.0	5.3	4.0	51.0	7.6	6.0	9.9
Crystal Starter and Broiler	8.8	18.4	16.0	4.9	4.0	49.4	8.2	6.0	10.3
Dailey Mills, Inc.									
Double Diamond All Mash Layer	9.6	13.7	15.0	4.1	3.5	57.8	7.9	7.0	6.9
*Double Diamond Broiler	8.2	15.1	18.0	3.9	3.5	50.9	5.9	7.0	7.0
*Double Diamond Egg Producer	9.4	15.1	18.0	3.3	3.5	58.5	7.0	7.0	6.7
*Double Diamond Pig and Hog Ration	8.3	19.2	18.0	4.5	3.5	47.0	8.9	7.0	12.1
Double Diamond Pork Producer	8.0	16.2	13.0	5.5	3.0	46.7	12.5	10.0	11.1
Double Diamond Turkey Grower (Pellets)	8.9	18.7	17.0	5.5	4.0	50.7	8.6	7.0	7.6
Double Diamond Turkey Grower (Pellets)	8.9	16.5	18.0	3.1	3.5	56.7	6.4	8.0	8.4

* See also table of "Brands Substantially Complying with Guarantees."

Brands Not Conforming to Guarantees—Continued

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash
		Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed	
Davis Feed Co.									
Davis 16% Kow Feed	9.2	19.6	16.0	4.2	4.0	48.9	11.0	8.0	7.1
Delaware Mills, Inc.									
Delaware Chick Starter	7.9	19.1	18.0	5.2	3.5	49.3	9.4	7.0	9.1
Delaware Emergency Growing Mash	9.0	16.0	16.0	4.9	3.0	54.3	8.7	7.0	7.1
Delaware Horse Feed	8.1	11.5	9.0	5.0	3.0	57.3	13.1	10.0	5.0
Delaware Pig & Hog Feed	7.8	16.7	16.0	5.3	4.0	52.3	9.9	8.0	8.0
Frank Diaulo									
Diaulo's Broiler Ration	10.3	17.6	18.0	5.6	5.0	51.1	7.5	6.0	7.9
Diaulo's Quick Growing Mash	9.8	18.6	16.0	5.8	4.0	50.8	6.8	5.0	8.2
Elmore Milling Co., Inc.									
Elmore Egg Mash	8.5	20.2	20.0	5.0	3.5	48.8	9.6	8.0	7.9
Elmore Hog Ration	8.4	18.6	15.0	4.7	4.0	48.9	12.1	8.0	7.3
Elmore Turkey Finisher (Fattener) (Pellets)	9.7	17.9	17.0	4.7	4.0	48.4	10.0	8.0	9.3
Elmore Turkey Growing Mash (Pellets)	7.7	22.3	20.0	4.3	4.0	45.5	10.2	8.0	10.0
John W. Eshelman & Sons									
Red Rose Growing Mash	6.6	19.4	16.0	5.2	3.5	50.6	10.1	7.5	8.1
Red Rose Laying Mash	7.6	18.2	18.0	4.4	3.5	52.1	9.9	7.5	7.8
Farm Bureau Association									
Farm Bureau Chick Starter Mash	7.2	20.4	20.0	4.8	3.5	43.6	9.1	7.5	14.9
J. B. Garland & Son, Inc.									
Garland Complete Starting & Broiler Mash	7.8	20.1	17.0	4.3	3.5	50.1	8.7	7.0	9.0
*Garland Growing Mash	8.2	17.9	17.0	4.5	3.5	51.5	8.8	7.0	9.1
*Garland Laying Mash	7.9	18.0	14.0	4.0	3.0	53.0	8.6	7.0	8.5
*Garland Laying Mash	8.1	18.3	18.0	4.1	3.0	50.9	9.2	7.0	9.4
Gateway Milling Association, Inc.									
Gateway All Mash Layer	8.7	16.9	15.0	5.0	3.5	54.7	9.4	7.5	5.3
Gateway Broiler Mash	8.1	18.1	18.0	4.7	3.0	52.6	9.8	7.5	6.7
Gateway Growing Mash	7.8	17.7	15.0	4.9	3.0	53.3	9.9	7.0	6.4
Gateway Special Laying Mash	7.7	17.9	16.0	5.2	3.5	53.3	9.2	7.0	6.7
General Mills, Inc., Purity Oats Division									
*Pulverized Oats	5.7	12.7	12.0	5.4	4.5	57.4	14.8	13.0	4.0

Getek Industrial & Agricultural Supplies Corporation Dried Distillers Solubles "A1"	6.0	23.3	25.0	4.8	2.0	52.6	4.1	2.5	9.2
W. K. Gimore & Sons, Inc. Neposet 18% Laying Mash	8.1	15.7	18.0	4.9	3.0	49.8	9.5	6.0	12.0
Hales & Hunter Co. Red Comb Egg Mash	5.7	24.1	20.0	4.0	3.0	48.8	8.6	7.0	8.8
Harper Feed Mills, Inc. Harco Scratch Grains	10.5	11.5	9.0	3.7	2.5	65.4	6.5	5.0	2.4
D. B. Hodgkins Co., Inc. *Hodgkins' Growing Mash & Laying Mash	{ 9.5 9.5 9.6 }	17.0 16.0 16.0	19.0 19.0 19.0	4.7 4.8 4.8	4.0 4.0 4.0	53.5 55.3 54.6	6.1 6.2 6.9	6.0 6.0 6.0	9.2 8.2 8.1
Hubinger Co. KeOkuk Corn Gluten Feed	5.2	17.9	23.0	6.0	2.0	63.4	5.0	8.5	2.5
Independent Tallow Co., Inc. Meat & Bone Scraps	4.9	47.4	50.0	9.2	6.0	-	-	-	33.6
International Sugar Feed Co. International Climax 16% Dairy Feed	6.4	16.6	16.0	4.4	3.5	45.6	16.4	14.0	10.6
Jaquith & Co. Dairy Ration Starting Feed	8.7 8.3	17.6 19.8	20.0 17.0	4.2 5.0	4.0 4.0	51.6 47.0	8.2 6.4	8.0 4.0	9.7 13.5
Mackenzie & Win-stow, Inc. Mackenzie's Worth Dairy Feed 20%	9.0	17.3	20.0	5.0	4.0	52.7	10.4	9.5	5.6
Mansfield Milling Co. Mansfield "20"	{ 8.4 8.4	16.8 19.3	20.0 20.0	5.8 4.6	4.0 4.0	48.7 50.5	12.7 10.1	8.5 8.5	7.6 7.1
*Mansfield Dry Poultry Mash	9.1	19.4	20.0	5.0	5.0	48.6	8.6	7.0	9.3
Meech & Stoddard, Inc. Red Wing Growing Mash	5.4	15.1	15.0	4.6	3.2	54.5	9.9	7.5	10.5
F. R. Miller Feed Mills 20% Egg & Breeder Mash	8.3	20.5	20.0	4.8	4.0	50.4	7.8	6.0	8.2

* See also table of "Brands Substantially Complying with Guarantees."

Brands Not Conforming to Guarantees—Continued

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash	
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed		
Geo. Q. Moon & Co., Inc.												
*Moon's Complete Growing Mash	{ 7.6	16.0	4.1	3.0	49.5	9.0	10.9					
	{ 7.7	16.0	4.1	3.0	49.4	9.0	9.9					
*Moon's Complete Laying Mash	{ 8.1	16.0	4.0	3.0	48.5	9.0	10.5					
	{ 7.5	17.9	4.2	3.0	49.4	9.0	10.1					
Turkey Growing Mash	{ 8.4	20.2	4.3	3.0	47.1	6.5	9.6					
New Bedford Grain Co.												
Special Growing	8.3	17.5	3.8	3.0	54.5	7.0	7.7					
Northwest Distributing Co.												
Northwest's 16% Dairy Ration	8.6	16.0	3.3	3.0	49.5	12.3	11.5					
Northwest's Pulverized Oats	8.0	11.0	4.4	3.5	56.2	12.0	5.1					
Ogden Grain Co.												
Biddy Laying Mash	7.7	18.9	5.5	4.0	51.0	9.4	7.5					
Ogden Complete Starter-Grower-Layer	{ 9.2	16.0	4.6	4.0	52.4	9.9	7.9					
	{ 7.1	16.4	5.3	4.0	53.4	10.2	8.0					
Ogden 16% Dairy Feed	{ 8.4	16.0	5.1	4.0	53.5	10.4	7.2					
Ogden Layer & Breeder	{ 8.7	16.9	4.9	4.0	52.2	9.7	7.0					
	{ 9.1	20.4	5.3	4.0	47.5	9.2	8.5					
Ogden Starter & Broiler Ration	9.1	17.4	5.0	4.0	51.4	9.2	7.9					
John Reardon & Sons Division of Wilson & Co., Inc.												
Register Brand 50% Protein Meat and Bone Scrap	{ 5.6	50.0	9.9	8.0	—	—	34.9					
	{ 6.0	48.9	11.4	8.0	—	—	30.8					
Russell-Miller Milling Co.												
Hard Wheat Occident Flour Middlings	11.1	16.5	2.9	4.0	64.8	1.5	3.2					
Schenley Distilleries, Inc.												
Schenley Corn Distillers Dried Grains	3.5	24.5	8.7	8.0	47.0	14.2	2.1					
Schuyler Milling Co.												
Puritan Growing Mash	7.9	17.2	2.9	3.5	48.0	10.6	13.4					
Sioux Sales Co.												
Sioux Brand Fortified 16% Pullet Developer	8.1	17.3	4.6	3.5	50.9	11.2	7.9					

Alfalfa Meals

Manufacturer and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash	Carotene Milligrams per Pound
		Found	Guar-anteed	Found	Guar-anteed		Found	Guar-anteed		
A. B. Caple Co. 17% Capex Dehydrated Alfalfa Meal	4.3	18.0	17.0	3.9	2.0	42.8	19.1	27.0	11.9	78
Caro-Green, Inc.										
Caro-Green Dehydrated Alfalfa Meal	{ 6.2 8.3 4.5	{ 18.2 19.1 16.9	{ 17.0 17.0 17.0	{ 2.8 3.2 3.3	{ 1.5 1.5 1.5	{ 36.5 39.5 39.4	{ 27.0 20.9 25.3	{ 28.0 28.0 28.0	{ 9.3 9.0 10.6	{ 27 34 37
Caro-Green Sun-Dried Alfalfa Meal	{ 4.4 6.6	{ 17.8 17.3	{ 17.0 17.0	{ 3.3 2.0	{ 1.5 1.5	{ 38.2 37.1	{ 26.0 27.3	{ 28.0 33.0	{ 10.3 9.7	{ 38 16
Caro-Green Alfalfa Meal	6.4	14.9	15.0	1.8	1.5	35.9	31.8	33.0	9.2	15
Dawson County Feed Products Co. Dehydrated Alfalfa Meal	6.2	17.3	17.0	2.6	1.5	38.9	25.8	30.0	9.2	25
Farm Industries, Inc. Alfalfa Meal 15	5.3	16.0	15.0	2.3	1.5	37.4	30.7	32.0	8.3	29
Fernando Alfalfa Milling Co. Ideal Greens Sun Cured Alfalfa Leaf Meal	5.7	22.0	20.0	3.4	2.5	39.1	18.0	18.0	11.8	46
Keystone Dehydrators Keystone Super-Green Dehydrated Alfalfa Meal	8.3	14.3	13.0	2.8	2.0	38.8	25.7	35.0	10.1	34
Loup Valley Alfalfa, Inc. Tri-Loup Brand 17% Dehydrated Alfalfa Meal	7.0	20.3	17.0	3.1	1.5	34.1	22.8	28.0	12.7	70
Nebraska Farm Products Emerald Brand 17% Dehydrated Alfalfa Meal	6.8	18.7	17.0	2.9	1.5	33.6	26.1	28.0	11.9	53
W. J. Small Co., Inc. Small's 17% Dehydrated Alfalfa Meal	{ 5.5 4.9 4.2	{ 18.3 20.7 19.2	{ 17.0 17.0 17.0	{ 3.0 3.5 3.3	{ 1.75 1.75 1.75	{ 37.7 39.3 38.3	{ 25.6 20.9 25.5	{ 27.0 27.0 27.0	{ 9.9 10.7 9.5	{ 41 61 33
Spivey Dehydrating Plant, Inc. Dehydrated Alfalfa Leaf Meal	6.1	13.2	17.0	3.0	2.0	43.7	26.3	20.0	7.7	40

Adulterated Ground Oats

Three samples of ground oats collected during the six-month inspection period were found to have an abnormal ash content, which ranged from 7.1 to 9.8 percent.

Analysis of the ash showed a calcium content of from 1.1 to 2.9 percent. Chemical and microscopic tests proved the calcium to be present in the form of limestone. Since analyses of over a thousand samples of ground oats averaged in the Handbook, "Feeds and Feeding" by F. B. Morrison, 20th ed., show an average calcium percentage in oats of not over .09 percent, it may be safely assumed that the calcium found in ground oats in excess of 0.2 percent is not a natural constituent.

Analyses of samples from future shipments of such adulterated ground oats will be referred to the Federal Food and Drug Administration for action.

Manufacturer (in boldface), Place Sampled, and Brand	Water	Protein		Fat		Nitrogen Free Extract	Fiber		Ash	Limestone Added (Calculated)
		Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed		
Fiambeau Milling Co. W. K. Gilmore & Sons, Inc., Walpole Pulverized White Oats.....	7.1	11.9	11.0	4.5	3.5	55.2	11.5	12.0	9.8	6.7
Arthur Ventura Grain Co., Taunton Pulverized White Oats.....	7.9	11.2	11.0	4.2	3.5	56.3	13.3	12.0	7.1	2.2
Schafer Oat Products Arthur Ventura Grain Co., Taunton "Big-S" Pulverized Oats.....	7.8	11.5	11.0	4.3	3.5	53.6	13.5	12.5	9.3	5.7

Poultry Feeds with an Ash Content in Excess of 11 Per Cent

Manufacturer and Brand	Water		Protein		Fat		Nitrogen Free Extract		Fiber		Ash	Acid Insoluble Ash	Calcium	Phosphorus	Salt
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed					
Beacon Milling Co., Inc.															
Beacon Breeders Mash	8.0	22.0	5.8	3.5	43.9	7.5	7.5	11.4	1.5	2.5	1.1	1.2			
Beacon Growing Mash	8.0	18.0	5.5	3.5	48.1	6.3	7.5	11.4	0.4	3.1	1.4	1.1			
Beacon Turkey Growing Mash Pellets	8.6	20.0	5.2	3.5	46.3	7.1	7.5	11.5	2.7	2.3	1.1	1.1			
Beacon Turkey and Game Bird Breeder Mash	6.6	22.0	5.7	3.5	43.9	7.5	7.5	12.2	1.6	2.9	1.2	1.1			
Chas. M. Cox Co.															
Wirthmore Laying Mash	8.8	20.0	4.9	3.0	45.5	6.0	7.0	12.3	0.8	3.2	1.3	1.3			
East Longmeadow Grain Store															
Blue Ribbon Growing Mash	7.1	20.0	5.9	4.0	47.8	5.9	6.5	11.9	0.5	3.0	1.5	1.3			
Blue Ribbon Laying Mash	7.6	20.0	5.7	4.0	47.2	6.7	6.5	11.7	0.5	3.0	1.4	1.3			
Eastern States Farmers' Exchange, Inc.															
Eastern States Developer	7.1	18.0	4.4	2.5	48.1	8.2	10.0	11.2	0.8	2.8	1.4	0.9			
Elmore Milling Co., Inc.															
Elmore Breeder Mash	8.7	20.0	4.8	4.0	45.1	7.0	8.0	13.5	0.7	3.3	1.1	1.8			
Elmore Complete Market Egg Mash	5.9	15.0	4.9	3.5	50.0	8.2	8.0	11.9	0.8	2.7	1.3	1.8			
Elmore M. A. C. Laying Mash	6.8	18.0	5.0	3.5	48.5	5.7	8.0	13.6	0.4	3.5	1.3	2.2			
Farm Bureau Association															
Farm Bureau Complete Market Egg	6.2	16.0	4.9	3.0	50.8	8.3	7.5	11.8	1.0	3.1	1.1	0.2			
General Mills, Inc., Larowe Division															
Larro 18% Egg Mash	7.3	18.0	5.2	3.0	48.0	7.2	8.0	11.7	0.7	3.3	1.5	1.2			
Larro Turkey Builder	7.9	24.0	5.9	3.0	40.0	7.7	7.5	13.0	0.5	3.3	1.6	1.3			
Larro Turkey Finisher	7.6	20.5	5.6	3.0	45.4	7.8	7.5	13.1	0.9	3.3	1.4	1.6			
D. Harbeck & Sons															
Egg Mash	8.7	20.0	5.0	4.0	49.1	6.4	7.0	11.4	1.0	3.1	1.2	1.1			

Jacquith & Co.													
Growing Mash	8.6	18.7	17.0	4.1	4.0	49.7	7.0	8.0	11.9	0.8	3.1	0.9	1.1
Laying Mash	8.9	19.0	18.0	3.9	4.0	49.3	6.7	8.0	12.2	0.8	3.5	1.0	0.6
Starting Feed	8.8	22.6	19.0	5.8	3.5	44.3	6.8	7.0	11.7	0.7	3.5	1.2	1.0
Park & Pollard Co., Inc.													
Lay or Bust Breeder Mash Pellets	8.4	23.2	20.0	4.7	2.5	45.4	6.1	7.5	12.2	1.1	2.8	1.3	1.2
Park & Pollard Chick Starter	8.1	20.2	20.0	4.5	2.5	49.6	6.0	8.5	11.6	0.8	3.2	1.0	0.9
Relston Purina Co.													
Purina 22% Lay Chow	8.3	24.5	22.0	4.7	3.5	42.6	7.2	8.0	12.7	0.6	3.6	1.3	1.2
Taunton Grain Co.													
Chick Starter	8.6	26.6	20.0	5.9	4.0	40.3	5.7	7.0	12.9	0.7	4.0	1.6	0.5
Growing Mash	9.1	21.8	18.0	4.7	4.0	45.5	7.8	7.0	11.1	0.9	2.8	0.9	1.7
Arthur Ventura Grain Co.													
Ventura Grower	7.6	17.8	16.0	4.9	4.0	51.1	7.0	6.0	11.6	3.0	2.3	0.9	0.9
Ventura Laying Mash	7.7	17.7	19.0	4.5	5.0	51.4	7.5	7.0	11.2	2.9	2.4	0.8	1.3
Ventura Starter with Charcoal	5.5	19.8	17.0	5.6	4.0	48.7	7.2	6.0	13.2	3.7	2.6	1.1	1.1
H. K. Webster Co.													
Blue Seal Breeder's Mash	7.7	20.3	20.0	4.4	3.5	47.2	7.9	7.0	12.5	0.8	3.1	1.0	0.9
Blue Seal Broiler Mash	8.2	21.5	20.0	6.0	3.5	45.2	5.6	7.0	13.5	1.0	3.3	1.2	1.6
Blue Seal Egg Mash	8.4	25.0	24.0	5.8	4.0	43.3	6.3	6.5	11.2	0.3	2.9	1.3	1.1
Blue Seal Growing Mash	8.3	20.0	18.0	5.3	3.5	48.3	6.0	6.5	12.1	0.5	3.1	1.2	1.5
Blue Seal Turkey Growing	8.4	18.9	18.0	4.4	3.5	48.1	7.4	7.0	12.8	1.0	3.3	1.0	1.3
Blue Seal Turkey Growing Pellets	8.2	21.1	20.0	5.5	3.5	46.4	6.6	7.0	12.2	0.5	3.2	1.2	1.7
	7.5	20.6	20.0	5.4	3.5	46.4	8.1	7.0	12.0	0.7	3.1	1.1	1.4
Stanley Wood Grain Co.													
Preferred Laying Mash	6.9	21.6	20.0	7.2	4.0	43.3	7.9	7.0	13.1	0.6	3.5	1.7	0.9

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FEEDINGSTUFFS
FOR SALE IN MASSACHUSETTS IN 1947**

Aberjona Division, General Foods Corporation, 209 New Boston St., Woburn, Mass.
 Acme Milling Co., Olean, N. Y.
 Acme-Evans Co., Inc., 902 West Washington Ave., Indianapolis 9, Ind.
 Albers Milling Co., Seattle 4, Wash.
 Allied Mills, Inc., Chicago, Ill.
 American Maize-Products Co., 100 East 42nd St., New York 17, N. Y.
 Anchor Mills, Hagerstown, Md.
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago, Ill.
 Archer-Daniels-Midland Co., Minneapolis 2, Minn.
 Armour & Co., Union Stock Yards, Chicago, Ill.
 Ashcraft-Wilkinson Co., 601 Trust Co. of Georgia Bldg., Atlanta 3, Ga.
 Auburn Nebraska Alialfa Co., Auburn, Neb.

B & B Dairy Co., Inc., Margaretville, N. Y.
 E. W. Bailey & Co., Montpelier, Vt.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Foods, Inc., 1442 Marine Trust Bldg., Buffalo 3, N. Y.
 Birkett Mills, Penn Yan, N. Y.
 Bisbee Linsed Co., 2100 Lincoln Liberty Bldg., Philadelphia 7, Penn.
 Blatchford Calf Meal Co., Waukegan, Ill.
 Blatchley & Ballard, Inc., Middletown, Conn.
 Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
 Borden Grain Co., West Water St., Taunton, Mass.
 Brookside Farms Laboratory, New Knoxville, Ohio
 George B. Brown Corp., Ipswich, Mass.
 Buckeye Cotton Oil Co., Cincinnati, Ohio.

A. B. Caple Co., Toledo 5, Ohio
 Cargill, Inc., 761 Grain Exchange, Minneapolis, Minn.
 Caro-Green, Inc., Kansas City 6, Mo.
 Central Mills, Inc., Dunbridge, Ohio
 Central Soya Co., Inc., Fort Wayne, Ind.
 Clinton Industries, Inc., Clinton, Iowa
 Coatsworth and Cooper Ltd., 67 Yonge St., Toronto 1, Canada
 Commander-Larabee Milling Co., Minneapolis, Minn.
 Community Service, Inc., Canaan, Conn.
 Consolidated Chemical Industries, Inc., Woburn, Mass.
 Consolidated Products Co., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Continental Distilling Corp., 1429 Walnut St., Philadelphia, Penn.
 Cooperative Mills, Inc., S. Wayne St., Auburn, Ind.
 Corn Products Sales Co., 17 Battery Place, New York 4, N. Y.
 Coucy & Sons Grain Co., 12 Waverly St., Taunton, Mass.
 Cover Grain & Feed Co., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston, Mass.
 Crawford Brothers, Inc., Walton, N. Y.

Dailey Mills, Inc., Olean, N. Y.
 Dairymen's League Co-operative Assn., Inc., 11 West 42nd St., New York 18, N. Y.
 Dawe's Manufacturing Co., 4806 South Richmond St., Chicago 32, Ill.
 Decatur Milling Co., Inc., Decatur, Ill.
 Dehydrating Process Co., 66 Mt. Washington Ave., Boston, Mass.
 Delaware Mills, Inc., Deposit, N. Y.
 Dehlinger's Alfalfa Mills, Bloomville, Ohio
 Frank Dianto, Randolph, Mass.
 F. Diehl & Son, Inc., Wellesley 81, Mass.
 Dietrich & Gambrell, Inc., Frederick, Md.
 Doughnut Corporation of America, Ellicott City, Md.
 Drackett Products Co., Cincinnati 32, Ohio
 J. L. Dunnell & Son, Bernardston, Mass.
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.

Eagle Roller Mill Co., New Ulm, Minn.
 East Bridgewater Farmer's Exchange, Inc., East Bridgewater, Mass.
 East Longmeadow Grain Store, East Longmeadow, Mass.
 Eastern States Farmers' Exchange, Inc., West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 M. W. Ellis Estate, 19 Walnut St., Peabody, Mass.
 Elmore Milling Co., Inc., Oronota, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Assn., Topsfield, Mass.
 Excelsior Milling Co., Minneapolis, Minn.

Faesy & Pesthoff, Inc., 220 East 42nd St., New York, N. Y.
 Farm Bureau Assn., 155 Lexington St., Waltham, Mass.
 Farm Industries, Inc., Toledo, Ohio
 Farmers Feed Co., 532 East 76th St., New York 21, N. Y.
 Federal Mill, Inc., Lockport, N. Y.
 Ferneau Grain Co., Blainester, Ohio
 Finer Lakes Division of Arrow Mills, Inc., Geneva, N. Y.
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Flambeau Milling Co., Phillips, Wis.
 Flory Milling Co., Inc., Bangor, Penn.
 Fred A. Fountain, Taunton, Mass.
 Frantz Basic Feeds, 124 Third Ave., Pittsburgh 22, Penn.

J. B. Garland & Son, Inc., 15 Grafton St., Worcester, Mass.
 Gateway Milling Assn., Inc., Dart at Letchworth, Buffalo 13, N. Y.
 General Foods Corp., Battle Creek, Mich.
 General Foods Corp., Corn Mill Division, Kankakee, Ill.
 General Mills, Inc., 400 Second Avenue South, Minneapolis 1, Minn.
 General Mills, Inc., Farm Service Division, Buffalo 3, N. Y.
 General Mills, Inc., Larowe Division, Detroit, Mich.
 Gerard Co., Monument & Haven Sts., Baltimore, Md.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis 6, Ind.
 Glidden Co., Soya Products Division, 5165 W. Moirat St., Chicago 39, Ill.
 Gloucester Dehydrating Process Co., Gloucester, Mass.
 Golden Eagle Milling Co., Petaluma, Cal. (Distributors for Western Condensing Co.)
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., New York, N. Y.

Hales & Hunter Co., 141 West Jackson Blvd., Chicago, Ill.
 D. Harbeck & Sons, New Bedford, Mass.
 Harper Feed Mills, Inc., Washington, Penn.
 Hercules Powder Co., Dairy Products Division, 332 South Michigan Ave., Chicago, Ill.
 Hespenheide and Thompson, Inc., York, Penn.
 D. B. Hodakins Co., Inc., 30 Pearl St., Gloucester, Mass.
 H. P. Hood & Sons, Inc., 500 Rutherford Ave., Boston 29, Mass.
 Hood Mills Co., 4100 East Monument St., Baltimore 5, Md.
 E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
 Hubinger Co., Keokuk, Iowa
 Humphreys-Godwin Co., Memphis 3, Tenn.

Illinois Yeast Co., Princeton, Ill.
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.
 International Milling Co., Minneapolis 1, Minn.

Jaquith & Co., 305 Main St., Woburn, Mass.

Kansas Flour Mills Co., 1000 New York Life Bldg., Kansas City, Mo.
 Kellogg Co., Battle Creek, Mich.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 Keystone Dehydrators, Box 204, Nazareth, Pa.
 H. H. King Flour Mills Co., Minneapolis, Minn.
 Kraft Foods Co., 500 Peshtigo Court, Chicago 90, Ill.
 Chas. A. Krause Milling Co., Milwaukee, Wis.

Larabee Flour Mills Co., 525 - 20 West 9th St., Kansas City, Mo.
 Lauthoff Grain Co., Danville, Ill.
 Lawrence Milling Co., 715 East 13th St., Wichita, Kan.

Mackenzie & Winslow, Inc., Fall River, Mass.
 Maine Fish Meal Co., Union Wharf, Portland, Maine
 Mansfield Milling Co., Mansfield, Mass.
 Maritime Milling Co., Inc., Buffalo 2, N. Y.
 Merrimack Farmers' Exchange, Inc., Concord, N. H.
 Midland Flour Milling Co., North Kansas City 16, Mo.
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.
 Monroe Alalta Mill, Monroe, Neb.
 Geo. O. Moon & Co., Inc., Binghamton, N. Y.
 Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.
 Mount Vernon Milling Co., Mount Vernon, Ind.

National Alfalfa Dehydrating and Milling Co., Lamar, Col.
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.
 National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
 National Milling Branch of National Biscuit Co., 2221 Front St., Toledo, Ohio
 Neumond Co., 300 Merchants Exchange Bldg., St. Louis, Mo.
 New Bedford Fish Products Corp., 2 Washburn St., New Bedford, Mass.
 New Bedford Grain Co., New Bedford, Mass.

P. Fred'k Obrecht & Son, 4101 East Monument St., Baltimore 5, Md.
 Ozden Grain Co., Utica, N. Y.
 Oswego Soy Products Corp., Oswego, N. Y.

Palm Grain Co., 1081 Gorham St., Lowell, Mass.
 Philip R. Park, Inc., Outer Harbor, San Pedro, Cal.
 Park & Pollard Co., Inc., 356 Hertel Ave., Buffalo 7, N. Y.
 George H. Parker Grain Co., Danvers, Mass.
 Pasco Packing Co., Dade City, Florida
 Patent Cereals Co., Geneva, N. Y.
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa
 Pillsbury Mills, Inc., Minneapolis 2, Minn.
 Pittsford Milling Co., Inc., Schoen Place, Pittsford, N. Y.
 R. C. Pratt, 68 King St. East, Toronto, Ont., Canada
 Publicker Industries, Inc., 1429 Walnut St., Philadelphia, Penn.

Quaker Oats Co., 141 W. Jackson Blvd., Chicago 4, Ill.

Ralston Purina Co., St. Louis, Mo.
 John Reardon & Sons Division of Wilson & Co., Inc., Cambridge, Mass.
 D. F. Riley, North Hatfield, Mass.
 Rodney Milling Co., Kansas City 8, Mo.
 Rossmoyne Processing Corp., Camp Hill, Penn.

Russell-Miller Milling Co., Minneapolis 1, Minn.
Ryther & Warren Co., Belchertown, Mass.

Saunders Mills, Inc., Box 1436 Central Station, Toledo, Ohio
Schenley Distilleries, Inc., 350 Fifth Ave., New York 1, N. Y.
Schoeneck Farms, Inc., Nazareth, Penn.
Joseph E. Seagram & Sons, Inc., Louisville, Ky.
Sherwin-Williams Co., Cleveland, Ohio
W. J. Small Co., Inc., 12th and Oak St., Kansas City 6, Mo.
A. E. Staley Manufacturing Co., Decatur, Ill.
Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
D. A. Stickell & Sons, Inc., Hagerstown, Md.
Stratton & Co., Concord, N. H.
Sunny Slope Farms, Nazareth, Penn.
Swift & Co., Union Stock Yards, Chicago 9, Ill.
Swift & Company Soybean Mills, Champaign, Ill.

Taunton Grain Co., Taunton, Mass.
Toledo Soybean Products Co., Toledo, Ohio

Union National Mill, Springfield, Ohio
Union Sales Corp., Columbus, Ind. (Distributor for Union Starch & Refining Co.)
United Cooperative Farmers, Inc., Fitchburg, Mass.
United Distillers of America, Inc., Gethsemane, Ky.
United Farmers Cooperative Creamery Assn., Inc., Charlestown, Mass.
United Mills Co., Inc., Grafton, Ohio
Unity Feeds, Inc., 177 Milk St., Boston, Mass.
Universal Grain Co., Newark, N. J.

Valier & Spies Milling Co., 5020 Shreve Ave., St. Louis 15, Mo.
Arthur Ventura Grain Co., Winter St., Taunton, Mass.
Vita-Vim Millers, 135 Scott St., Buffalo, N. Y.
O. B. Vunck & Son, Voorheesville, N. Y.

Wakefield Sawdust & Shavings Co., Wakefield, Mass.
Hiram Walker & Sons, Inc., Peoria, Ill.
C. P. Washburn Co., Middleboro, Mass.
Wayne County Grangers Feed Corp., Clyde, N. Y.
H. K. Webster Co., Lawrence, Mass.
Western Condensing Co., San Francisco, Cal.
Whitmoyer Laboratories, Inc., Myerstown, Penn.
Stanley Wood Grain Co., Taunton, Mass.
Woods & Sprague Milling Co., Inc., Albion, N. Y.
Worcester Grain & Coal Co., Worcester, Mass.

AGRICULTURAL EXPERIMENT STATION
MASSACHUSETTS

CONTROL SERIES

BULLETIN NO. 133

JULY 1947

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventy-fourth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1947

By Fertilizer Control Service Staff:

John W. Kuzmeski, *Official Chemist, in Charge*
Albert F. Spelman, *Senior Chemist*
C. Tyson Smith, *Assistant Chemist*
Joseph A. Bart, *Junior Chemist*
Charles J. Rogers, *Junior Chemist*
Robert T. Wetherbee, *Junior Chemist*

Joseph Martell, *Technical Assistant*
Joseph Conklin, *Inspector*
George E. McLaughlin, *Inspector*
Richard P. Patterson, *Inspector*
Cora B. Grover, *Senior Clerk*

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PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesium.

Label must show:

 Net weight of fertilizer

 Name, brand or trade mark, and grade

 Name and address of manufacturer

 Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tannage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1.

Tonnage fee: 6 cents per ton of 2,000 pounds.

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1947 by 65 firms, covering 248 brands of mixed fertilizer and unmixed fertilizing materials.

The following brands were not found on display by the sampling agent at any point in the State and therefore do not appear in the tables of analyses.

Brands of Fertilizer Registered but Not Sampled

Acme Guano Co. Acme 5-8-7	E. I. du Pont de Nemours & Co. Du Pont Uramon Fertilizer Compound (42-0-0)
American Agricultural Chemical Co. Agrico for Cranberries 7-7-7	Eastern States Farmers' Exchange, Inc. Eastern States 0-19-19 W/Borax, 2% magnesium oxide Eastern States 0-20-20, 2% magnesium oxide
American Liquid Fertilizer Co., Inc. Liqua-Vita 6-9-7	Humphreys-Godwin Co. Dixie Brand 41% Protein Prime Cottonseed Meal (6.58-0-0)
American Potash & Chemical Corp. Trona Muriate of Potash (0-0-60)	Kerr Manufacturing Co. Quick Growth 4-8-4
Apothecaries Hall Co. Liberty Fertilizer 0-14-14 Liberty Tobacco Starter 4-10-0 Liberty Tobacco Mixture (with Cotton Hull Ashes) 6-3-6 Liberty Green Gro 6-7-4 Castor Pomace (4-5-0-0)	Olds & Whipple, Inc. O & W 5-10-5 Fertilizer
Armour Fertilizer Works Armour's Big Crop Fertilizer 0-14-7	Ra-Pid-Gro Corporation Ra-Pid-Gro 23-21-17
W. Allee Burpee Co. Burpee-Gro Tablets 7-13-26	Rogers & Hubbard Co. Hubbard Dry Ground Fish (9.56-5-0)
California Stucco Products of N. E., Inc. Nutrex 16-6-8	Ruhm Phosphate & Chemical Co. Red Seal Brand Ruhm's Phosphate Rock (0-30-0)
Chamberlin & Barclay, Inc. Old Reliable 7-7-7	M. L. Shoemaker Div., Wilson & Co., Inc. M. L. Shoemaker's "Swift-Sure" 5-8-7
Ross Daniels, Inc. Ross Nutrient Cartridges 8-16-8	Swift & Co., Plant Food Division Cattle Manure (1.85-.75-1.75)
Davey Tree Expert Co. Davey Tree Food 12-4-4	C. P. Washburn Co. Special Potato 5-10-10

FERTILIZER TONNAGE
Tonnage of Fertilizers Sold in Massachusetts

	1945		1946	
	Jan. 1 to July 1	July 1 to Dec. 31	Jan. 1 to July 1	July 1 to Dec. 31
Mixed fertilizers.....	60,040	5,112	62,960	6,668
Fertilizer chemicals and materials unmixed.....	9,857	2,567	8,556	4,153
Pulverized animal manures.....	1,488	354	1,446	527
Totals.....	71,385 <i>a</i>	8,033 <i>a</i>	72,962	11,348

a Does not include tonnage distributed by A.A.A.

Tonnage of Mixed Fertilizers, January 1, 1946, to December 31, 1946

Grade*	Tonnage			Brands	Grade*	Tonnage		
	Jan. 1 to July 1	July 1 to Dec. 31				Jan. 1 to July 1	July 1 to Dec. 31	
5-8-7	16,160	1,268	20	6-5-5	174	—	—	
5-10-10	15,865	828	19	8-8-4	165	50	—	
6-3-6	9,627	22	12	5-10-3	138	183	—	
7-7-7	5,189	1,566	13	5-3-5	136	—	—	
4-12-4	4,360	585	12	6-12-4	77	21	—	
5-10-5	4,534	328	19	5-15-5	72	—	—	
8-16-16	1,891	244	6	6-8-6	62	—	—	
4-10-10	949	93	—	0-20-20	59	16	—	
4-12-8	923	49	5	5-15-20	47	17	—	
3-12-6	523	14	—	4-8-4	36	13	—	
0-14-14	495	507	6	5-8-5	16	3	—	
8-6-4	494	126	—	6-6-4	14	4	—	
10-10-10	450	330	—	6-7-4	13	—	—	
8-24-8	447	2	—	7-8-5	12	—	—	
4-12-16	293	134	—	0-14-7	—	104	—	
8-6-2	277	40	—	Miscellaneous	39	28	17	
6-10-4	250	86	—					
8-4-8	182	7	—	TOTALS	62,960	6,668	156	

*The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1, 1946, to December 31, 1946

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Nitrate of soda.....	2,699	394	3
Superphosphate.....	2,436	1,996	12
Milorganite.....	890	899	—
Ammonium nitrate.....	683	67	—
Muriate of potash.....	621	52	7
Bone meal.....	362	210	11
Sulfate of ammonia.....	276	31	6
Castor pomace.....	154	—	—
Cyanamid.....	149	7	—
Fish.....	85	—	—
Cottonseed meal.....	59	462	—
Bone and tankage.....	35	10	—
Tankage.....	33	—	—
Sulfate of potash.....	15	—	—
Miscellaneous.....	59	45	—
TOTALS.....	8,556	4,153	61

MIXED FERTILIZERS
 Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
Agricultural Laboratories, Inc.	1	1	3	0	0	0	
American Agricultural Chemical Co.	45	19	135	20	4	2	2
Apothecaries Hall Co.	18	18	54	0	0	0	0
Amour Fertilizer Works	18	15	54	4	0	0	0
F. A. Bartlett Tree Expert Co.	2	1	6	1	0	0	0
Berkshire Chemical Co.	19	15	56	4	0	0	0
Joseph Breck & Sons Corporation	5	2	15	3	0	0	0
Consolidated Rendering Co.	17	12	49	2	1	1	1
Doggett-Freil Co.	1	1	3	0	0	0	0
Eastern States Farmers' Exchange, Inc.	14	7	50	1	5	0	2
Essex County Co-operative Farming Association	3	2	9	0	1	0	0
Excell Laboratories	1	1	3	0	0	0	0
Frost & Higgins Co.	1	0	3	0	1	0	0
Goulard & Oleno, Inc.	3	1	9	0	2	0	1
Hydroponic Chemical Co., Inc.	1	1	3	0	0	0	0
Hy-Trous Corporation	6	4	18	2	0	0	1
International Minerals & Chemical Corp.	34	12	111	18	6	3	0
McCormick & Co., Inc.	1	1	3	0	0	0	0
Miller Chemical & Fertilizer Corp.	2	0	6	0	0	0	2
Old Deerfield Fertilizer Co., Inc.	22	16	67	6	0	0	0
Olds & Whipple, Inc.	9	8	27	0	0	0	1
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbe Corporation	1	1	3	0	0	0	0
Plantspur Products Co.	1	1	3	0	0	0	0
Ralston Purina Co.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	19	16	56	3	0	0	0
O. M. Scott & Sons Co.	3	2	9	0	1	0	0
Sears, Roebuck & Co.	1	1	3	0	0	0	0
M. L. Shoemaker Div. of Wilson & Co., Inc.	2	2	5	0	0	0	0
Smith Agricultural Chemical Co.	1	1	3	0	0	0	0
Swift & Company Plant Food Division	8	0	24	3	5	1	2
Tennessee Corporation	1	1	3	0	0	0	0
Universal Chemical Co.	1	0	3	0	0	1	0
C. P. Washburn Co.	1	1	3	0	0	0	0
Woodruff Fertilizer Works	2	1	6	1	0	0	0
TOTALS	266	166	811	68	26	8	12

Explanation of Table of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

This table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More Per Ton

Name of Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Where Sampled	Approximate Commercial Shortage Per Ton
	Water Insoluble	Total				
American Agricultural Chemical Co. Agrico for Corn 3-12-6	.17	3.33	11.10	6.74	Fair Grain Co., Holliston	\$1.97
Agrico for Corn 3-12-6(a)	.16	3.11	11.02	6.24	Frank Kuzmeskus, Montague	1.67
Agrico Country Club Fertilizer 8-6-2	2.35	7.36	7.33	2.33	New Bedford Country Club, North Dartmouth	2.38
Eastern States Farmers' Exchange, Inc Eastern States 10-10-10 (a)	.18	10.37	9.04	11.37	August Tomaszewski, Amherst, R.F.D.	1.63
Goulard & Olena, Inc. G & O Dablia Food 5-6-15 (d)	.48	4.50	7.05	12.01	Joseph Breck & Sons Corporation, Boston	b
Hy-Trous Corporation Hy-Trous 4-8-4 (a)	—	4.02	7.15	3.91	DeWolfe & Vincent, New Bedford	b
International Minerals & Chemical Corporation International Tobacco 6-3-6 (a)	2.50	5.58	3.40	6.24 c	John Keefe, Hadley	1.60
Miller Chemical & Fertilizer Corporation VHPF 5-25-15 (d)	—	8.48	12.32	29.06	Skibiski & Panek, South Deerfield	b
VHPF 5-25-15 (d)	—	6.47	20.30	22.14	Skibiski & Panek, South Deerfield	b
Olds & Whipple, Inc. O & W 4-12-4 Market Garden Fertilizer	1.09	4.51	10.80	5.40	Joseph A. Skalski, South Deerfield	2.04
Swift & Company Plant Food Division Blenn 5-10-5	.41	4.46	10.35	5.39	Boston Gardening Co., Waban	1.76
Brimm 5-10-10	.08	4.61	10.38	8.95	Westboro State Hospital, Westboro	2.21
Brimm 5-10-10 (a)	.08	4.54	10.42	8.82	Industrial School for Boys, Shirley	2.56

a See also table of "Mixtures substantially complying with guarantees."

b Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with other seriously deficient mixtures.

c Potash in forms other than muriate.

d Withdrawn from sale.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Agricultural Laboratories, Inc.		
Stim-U-Plant 11-12-15	1	.08
American Agricultural Chemical Co.		
AA Quality Fertilizer 5-8-7	1	.13
AA Quality Fertilizer 5-10-10	1	.20
Agrico for Corn 3-12-6	3 ^a	.17
Agrico for Seeding Down 3-12-12	2	.19
Agrico for Corn 4-12-4	2	.16
Agrico for Cranberries 5-8-7	1	.20
Agrico for New England 5-8-7	6	.17
Agrico for Gardens 5-10-5	2	.15
Agrico for Onions 5-10-5	3	.22
Agrico for Potatoes 5-10-10	6	.17
Agrico for Tobacco 6-3-6	6 ^b	2.81
Agrico Broadleaf Evergreens 6-10-4	1	.42
Agrico Country Club Fertilizer 6-10-4	1	.20
Agrico for Lawns, Trees & Shrubs 6-10-4	2	.17
Agrico for Top Dressing 7-7-7	5	.11
Apothecaries Hall Co.		
Liberty Fertilizer 4-12-4	3	.42
Liberty High Grade Market Gardeners 5-8-7	3	.53
Liberty Fertilizer 5-10-5	1	.12
Liberty Fertilizer 5-10-10	3	.41
Liberty Fertilizer (with Sulphate Potash) 5-10-10	1 ^b	.11
Liberty Tobacco Mixture 6-3-6	6 ^b	3.08
Liberty Fertilizer Special for Fruit & Grass 7-7-7	1	.73
Armour Fertilizer Works		
Armour's Big Crop Fertilizer 4-12-4	2	.30
Armour's Big Crop Fertilizer 4-12-8	2	.27
Armour's Big Crop Fertilizer 5-8-7	3	.17
Armour's Big Crop Fertilizer 5-10-5	2	.29
Armour's Lawn & Garden Fertilizer 5-10-5	1	.25
Armour's Big Crop Fertilizer 5-10-10	2	.19
Armour's Big Crop Tobacco Special 5-3-6	2 ^b	2.29
Armour's Big Crop Fertilizer 7-7-7	3	.22
Armour's Special Ornamental Fertilizer 10-6-4	1	.21
F. A. Bartlett Tree Expert Co.		
Bartlett Green Tree Food 6-8-6	2	.42
Berkshire Chemical Co.		
Berkshire 0-14-14	1	—
Berkshire 4-12-4	2	.25
Berkshire 5-8-7	4	.20
Berkshire 5-10-5	2	.22
Berkshire 5-10-10	2	.18
Berkshire 5-10-10 with 2% water soluble magnesium oxide	2	.16
Berkshire 6-3-6 Tobacco	4 ^b	2.80
Berkshire 7-7-7	2	.13
Joseph Breck & Sons Corporation		
Breck's Country Club Fertilizer 8-6-2	1	.20
Brexone Garden-Gro 5-10-10, 2% magnesium oxide	2	.11
Brexone Turf-Gro 8-6-2	2	.16
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser	2	—
Corenco 4-12-4 Complete Manure	3	.14
Corenco 5-8-7 Potato & General Crop	6	.16
Corenco 5-10-5 Home Garden	2	.20
Corenco 5-10-10 Peerless Potato	4	.15
Corenco 6-3-6 Special Tobacco Grower	1 ^b	3.40
Corenco 8-6-4 Landscape	2	.59
Doggett-Pencil Co.		
D & P Rose Food 5-8-3	1	2.83

^a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

^b Potash in forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Eastern States Farmers' Exchange, Inc.		
Eastern States 5-10-5 Garden, 2% magnesium oxide	2	.35
Eastern States 5-10-10, 1% magnesium oxide	2	.18
Eastern States 5-15-10	1	.18
Eastern States 5-15-15, 1% magnesium oxide	1	.17
Eastern States 8-4-8 Tobacco, 1% magnesium oxide	1 b	3.62
Eastern States 8-12-16 LCS, 1% magnesium oxide	1 b	.17
Eastern States 8-16-16, 1% magnesium oxide	1	.20
Eastern States 8-24-8	1	.25
Eastern States 10-10-10	1 a	.20
Eastern States 13-30-0	2	.18
Essex County Co-operative Farming Association		
S-X Brand 5-8-7	1	.14
S-X Brand 5-10-10, 2% magnesium oxide	1	.13
S-X Brand 7-7-7	1	.11
Excel Laboratories		
"New Plant Life" 2-1-2	1	—
Frost & Higgins Co.		
Frost & Higgins Special Tree and Shrub Food 8-6-4	1	.49
Goulard & Olena, Inc.		
G & O Rhodo-Azalea-Camellia 3-20-3	1	.85
G & O Rose Food 7-8-5	1	1.42
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19	1	—
Hy-Trous Corporation		
Hy-Trous 4-8-4	5 a	—
International Minerals & Chemical Corporation		
International 0-14-14	2	—
International 4-12-4	10	.19
International 4-12-8	1	.24
International 5-8-7	11	.13
International 5-10-5	5	.16
International 5-10-10	8	.18
International Caribee 5-10-10, 2% water soluble magnesium oxide	2	.30
International Potato 5-10-10, 2% water soluble magnesium oxide	4	.11
International Tobacco 6-3-6	1 a c	2.17
International 7-7-7	4	.12
International Fruit 7-7-7, 3% water soluble magnesium oxide	2	.35
International Lawn Fertilizer 8-6-2	1	.18
International 8-16-16, 1.5% magnesium oxide	2	.19
McCormick & Co., Inc.		
Hy-Gro 13-26-13	1	.57
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 4-12-4	2	.26
Old Deerfield 5-5-15	1 b	2.37
Old Deerfield 5-8-7 All Crop Fertilizer	2	.13
Old Deerfield 5-8-7, 2% magnesium oxide, potash other than muriate	1 b	.10
Old Deerfield 5-10-5 Trucker's Special	1	.18
Old Deerfield 5-10-10 Potato Fertilizer	3	.14
Old Deerfield 6-3-6 Complete Tobacco Fertilizer	10 b	3.06
Old Deerfield Lawnshrub 6-5-5	1	1.54
Old Deerfield 7-7-7 Grass Top Dressing	1	.14
Olds & Whipple, Inc.		
O & W 5-3-5 Complete Tobacco Fertilizer	1 b	2.76
O & W 5-8-7 Potato & General Purpose Fertilizer	1	.41
O & W 5-8-7 Potato & General Purpose Fertilizer with Sulphate	1 b	1.10
O & W 5-10-10 Potato Fertilizer	1	.38
O & W 6-3-6 Blue Label Tobacco Fertilizer	2 b	3.38
O & W 6-3-6 Blue Label Tobacco Fertilizer, Potash derived from Cotton Hull Ash	1 b	3.52
O & W 7-7-7 Top Dressing & Grass Fertilizer	1	.57

a See table of "Mixtures showing a commercial shortage of \$1 or more per ton"

b Potash in forms other than muriate.

c Potash as muriate, .86%; in forms other than muriate, 5.59%.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
F. G. Phillips Co.		
Ferti-Flora 3-3-3	1	—
Plantabbs Corporation		
Fulton's Plantabbs 11-15-20	1	—
Plantspur Products Co.		
Plantspur 4-4-2	1	.50
Ralston Purina Co.		
Purina Plant Food 5-10-5	1	.17
Rogers & Hubbard Co.		
Gro-Fast Plant Food 5-8-5	1	1.04
Hubbard Potato Fertilizer 5-8-7	2	1.24
Hubbard High Potash Fertilizer 5-10-10	1	1.24
Hubbard Tobacco Grower 6-3-6	1 ^b	3.12
Red H 0-14-14	1	—
Red H 4-12-4	2	.64
Red H 4-12-8	1	.18
Red H 5-8-7	3	.24
Red H 5-10-5	1	.32
Red H 5-10-10	3	.21
Red H 7-7-7	2	.50
Red H 8-16-16	1	.25
O. M. Scott & Sons Co.		
Scotts Turf Builder 8-7-3	2	2.26
Scotts Lawn Food plus Weed Control 9-9-9	1	3.67
Sears, Roebuck & Co.		
Garden Master Plant Food 5-10-5	1	.20
M. L. Shoemaker Division of Wilson & Co., Inc.		
M. L. Shoemaker's "Swift-Sure" 4-10-0	1	1.11
M. L. Shoemaker's "Swift-Sure" 6-3-6	1 ^b	3.68
Smith Agricultural Chemical Co.		
Sacco 4-12-4	1	.43
Swift & Company, Plant Food Division		
Brimm 5-10-10	1 ^a	.09
Vigoro 4-12-4	6	.15
Tennessee Corporation		
5-10-5 Loma	1	.23
Universal Chemical Co.		
Electra Plant Food 5-10-3	1	1.74
C. P. Wasburn Co.		
Market Garden 5-2-7	1	.21
Woodruff Fertilizer Works		
Woodruff's 5-8-7 Fertilizer	1	.61
Woodruff's Tobacco Fertilizer 6-3-6	1 ^b	2.94

^a See table of "Mixtures showing a commercial shortage of \$1 or more per ton."

^b Potash in forms other than muriate.

NITROGEN COMPOUNDS

Ammonium Nitrate, Calcium Cyanamid, Castor Pomace, Nitrate of Soda,
Sulphate of Ammonia

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
Allied Chemical & Dye Corp., The Barrett Division Arcadian the American Nitrate of Soda	16 02	16 00
American Cyanamid Co. 20 6% Aero Cyanamid, Granular.....	20 60	20 60
Aeroprills Ammonium Nitrate Fertilizer Compound.....	33 04	33 50
Chilean Nitrate Sales Corporation Chilean Nitrate of Soda—Champion Brand.....	16 03	16 00
Chilean Nitrate of Soda—Champion Brand.....	16 11	16 00
Chilean Nitrate of Soda—Champion Brand.....	16 00	16 00
Ford Motor Co. Ford Ammonium Sulphate	20 82	20 80
International Minerals & Chemical Corporation Castor Pomace.....	6 02	4 53
L. B. Lovill & Co. "Lovit Brand" 41% Protein Cottonseed Meal.....	6 64	6 56
Old Deerfield Fertilizer Co., Inc Old Deerfield Sulfate of Ammonia.....	20 68	20 50

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Dry Ground Fish, Animal Tankage, Milorganite

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid		Available Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed
Apothecaries Hall Co. Dry Ground Fish.....	10 37	9 00	8 13	5 00	—	—
Dry Ground Fish.....	10 12	9 00	7 35	5 00	—	—
Old Deerfield Fertilizer Co., Inc. Dry Ground Fish.....	9 14	9 46	7 63	5 00	—	—
Olds & Whipple, Inc. O & W Dry Ground Fish.....	10 16	9 00	7 15	5 00	—	—
N. Roy & Son Animal Tankage.....	7 00	7 00	13 08	—	11 24	8 00
Sewerage Commission of the City of Milwaukee Milorganite.....	6 04	6 00	3 41	—	2 89	2 00
Milorganite.....	5 88	6 00	3 43	—	2 87	2 00
Milorganite.....	5 77	6 00	3 18	—	2 44	2 00
Milorganite.....	6 05	6 00	3 23	—	2 57	2 00
Milorganite.....	5 91	6 00	3 46	—	2 74	2 00
Milorganite.....	6 39	6 00	3 26	—	2 88	2 00
Milorganite.....	5 90	6 00	3 13	—	2 63	2 00
Milorganite.....	5 85	6 00	3 16	—	2 62	2 00
Milorganite.....	5 90	6 00	3 41	—	2 83	2 00

Ground Bone

Manufacturer	Nitrogen		Total Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
American Agricultural Chemical Co.	2 70	2 00	27 88	25 00
	2 98	2 00	26 66	25 00
Armour Fertilizer Works.	2 33	2 47	25 20	23 00
Consolidated Rendering Co.	1 96	2 00	27 42	23 00
	1 89	2 00	26 31	23 00
	4 00	4 00 ^a	20 65	20 00
A. H. Hoffman, Inc.	3 78	3 70	20 96	20 00
	3 84	3 70	19 70	20 00
International Minerals & Chemical Corp.	3 81	3 70	20 87	20 00
	4 08	3 70	20 10	20 00
	4 02	3 70	19 14	20 00
John Reardon & Sons Division of Wilson & Co., Inc.	2 19	2 60	27 52	21 00
	1 92	2 00	25 76	21 00
Rogers & Hubbard Co.	4 30	4 00	23 89	23 00
	4 27	4 00	24 04	23 06
	4 12	2 00	25 05	23 00
	2 05	2 00	27 67	23 00
	1 41	1 25	32 57	30 00
	1 39	1 25	32 32	30 00
	1 12	1 25	33 38	30 00

^a Corenco Raw Bone & Tankage

Adulterated Ground Bone

From time to time inspectors of the Fertilizer Control Service have found small lots of mixtures consisting of bone meal and various other fertilizer materials such as sulfate of ammonia, urea, superphosphate, phosphate rock, horn and hoof meal, etc. Such mixtures have been sold as "ground bone", "reinforced ground bone", etc., usually with no statement on the label to indicate that the product was a mixture of several fertilizer ingredients and not a straight ground bone product. Generally, the phosphoric acid guarantees in these cases were in terms of total phosphoric acid. This was in violation of the provision of the Massachusetts Fertilizer Law which requires that, in cases of fertilizer mixtures, the *available* phosphoric acid shall be guaranteed.

The sale of the "ground bone" mixtures has been stopped wherever found. As the dealers actually selling the products were unaware of their nature and were handling them in good faith no legal action was taken against the dealers. The mixtures were manufactured outside the Commonwealth.

It has been claimed that the mixtures sold as "reinforced ground bone" or "ground bone" were better than straight bone meal for growing plants. If this line of reasoning is followed a step further it may be shown that a regular 5-10-5 or a 4-8-4 fertilizer is even a more balanced source of plant food for most plants than is straight bone meal or the "reinforced ground bone".

A 5-10-5 fertilizer sold for about \$45.00 per ton the past season. Bone meal was quoted at about \$100.00 per ton. It would not have been considered ethical to sell a 5-10-5 fertilizer labelled as "ground bone" for \$100.00 per ton. Certainly no fertilizer control official would have permitted it.

Aside from the economic one, there is another factor involved. To many gardeners ground bone has come to mean, besides a good source of plant food, a fertilizer that is "safe" or "fool-proof". That is, it may be mixed with soil in almost any concentration without injuring the roots of plants set in that soil. This quality of pure bone meal is especially prized by many florists in potting plants. Mixtures containing soluble inorganic or synthetic organic salts cannot be used in like manner without risk of plant injury.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
18% Normal Superphosphate	18.99	18.00	18.00
18% Normal Superphosphate	19.04	18.04	18.00
Apothecaries Hall Co.			
Superphosphate 20%	21.31	20.81	20.60
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%	21.41	21.41	20.00
Consolidated Rendering Co.			
Coenco Superphosphate 20%	21.06	20.28	20.00
Davison Chemical Corporation			
Davco Granulated Superphosphate 20%	21.61	20.71	20.00
Eastern States Farmers' Exchange, Inc.			
Eastern States Superphosphate 20%	20.35	20.21	20.00
Eastern States Superphosphate 20%	21.72	21.36	20.00
International Minerals & Chemical Corporation			
International 20% Superphosphate	21.56	20.16	20.00
International 20% Superphosphate	21.51	20.31	20.00
International 20% Superphosphate	21.51	20.03	20.00
International 20% Superphosphate (a)	21.21	20.13	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield Superphosphate 20%	20.45	20.31	20.00
Rogers & Hubbard Co.			
Hubbard 20% Superphosphate	20.00	20.00	20.00
Brand Showing Commercial Shortage of More than \$1 per Ton			
International Minerals & Chemical Corporation			
International 20% Superphosphate	20.00	18.64^b	20.00

a Composite of 3 samples.

b Commercial shortage, \$2.31 per ton.

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Apothecaries Hall Co.	60 64	60.00
Eastern States Farmers' Exchange, Inc.	61 20 62 04	60.00 60.00
Farm Bureau Association.	61.43	60.00
International Minerals & Chemical Corporation.	60 48	60.00
Old Deerfield Fertilizer Co., Inc.	60 68	60.00
Brand Showing Commercial Shortage of More than \$1 per Ton		
Rogers & Hubbard Co.	58 83^a	60.00

^a Commercial shortage, \$1.05 per ton.

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash	Organic Matter	Acid Insoluble Ash (a)	Moisture
American Agricultural Chemical Co. Pulverized Sheep Manure (1.25-1-2).....	1.78	1.60	2.19	43.17	31.23	7.40
Apothecaries Hall Co. Sheep Manure (1.-5-1).....	1.70	1.24	2.32	56.80	36.30	6.90
Armour Fertilizer Works Shredded Cattle Manure (1.25-1-1).....	1.26	1.04	.85	30.85	45.90	6.50
Pulverized Sheep Manure (1.5-1-1.5).....	1.50	1.31	1.76	36.95	38.19	6.80
Atkins & Durbrow, Inc. Driconture (2-1-1).....	3.60	3.00	1.74	73.47	2.03	12.30
Consolidated Rendering Co. Corenco Sheep Manure (1.25-1-2).....	1.54	1.72	3.97	43.77	34.08	6.30
Spurz-on (3.5-3.5-1.5).....	3.55	3.79	1.59	68.65	4.45	7.70
Glendale Poultry Farm Buff Peat-Poultry Manure (2-3-1).....	2.49	3.62	2.30	65.40	4.70	12.90
A. H. Hoffman, Inc. Cow Manure (Dehydrated) (2-1-1).....	2.07	1.41	2.27	83.17	2.58	5.10
Poultry Manure (Dehydrated) (3-1-1.5).....	3.42	4.22	1.86	68.01	6.45	5.10
Sheep Manure (Kiln-Dried) (1.5-1-2).....	1.68	1.46	3.38	48.95	38.75	5.30
International Minerals & Chemical Corp. Sheep Manure (1.25-1-2).....	1.60	1.52	3.57	46.07	33.10	6.10
Norwood Brand Fertilizer Co. Sheep Manure Screened from Wool (1.5-.35-2.75).....	1.50	.35	3.63	31.95	46.91	4.20

a The acid insoluble ash is mainly sand although it may contain other materials which are practically valueless as plant food.

Pulverized Animal Manures—Concluded

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash	Organic Matter	Acid Insoluble Ash (a)	Moisture
Pulverized Manure Co.						
Wizard Brand Cow Manure (2-1-1).....	2 03	2 00	2 31	53 50	25 78	6 50
Wizard B and Pulverized Sheep Manure (2-1-2).....	1 49	1 75	3 39	47 30	38 50	4 90
Rogers & Hubbard Co.						
Gro-Fast Cow Manure (2-1-1).....	2 21	3 09	1 81	56 30	22 30	8 50
Gro-Fast Sheep Manure (1-25-1-2).....	1 57	1 57	4 07	44 62	35 79	5 10
Gro-Fast Sheep Manure (1-29-1-2).....	1 89	1 67	3 74	53 61	21 25	8 90
Scars, Roebuck & Co.						
Garden Master Sheep Manure (1-5-1-2).....	1 68	1 67	4 30	47 50	31 10	6 90
Stockdale Fertilizer Co.						
Ovene (Sheep Manure) (2-1-2).....	2 19	1 67	2 89	68 70	12 00	7 50
Swift & Conroy, Plant Food Division						
Sheep Manure (1-5-1-2).....	2 07	1 62	2 90	49 15	29 81	5 20
Walker-Gordon Laboratory Co.						
Po-yung (2-1-1).....	2 09	1 00	2 61	52 37	3 75	5 90

a The acid insoluble ash is mainly sand although it may contain other material which are practically valueless as plant food.

AGRICULTURAL LIME PRODUCTS

Manufacturers and Brands

During 1947, 11 firms registered for sale in Massachusetts 24 brands of lime products, manufactured and sold for neutralizing acid soils. The products are grouped as follows:

Hydrated or slaked lime.....	14
Ground limestone	10
	24

The analytical results which appear in this bulletin represent officially drawn samples secured by the same sampling agents who drew the samples of commercial fertilizer which served for the inspection of that commodity; the samples therefore came from every section of the State and are, we believe, representative of the lime products sold in Massachusetts as soil amendments.

We were not successful in securing samples of the following brands:

Conklin Limestone Co., Inc., Canaan, Conn
High Magnesium Agricultural Ground Limestone

Goulard & Otten, Inc., Skillman, N. J.
G & O Agricultural Limestone

Kelley Island Lime & Transport Co., 1122 Leader Bldg., Cleveland, Ohio
Tiger All Purpose Hydrated Lime

Explanation of Table of Analyses

Tables I and II: "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "percent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "percent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical analysis" the figures represent the percentage of product that would pass or be retained by the meshed sieves mentioned.

Table I. Hydrated or Slaked Lime

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	
Brewer & Co., Inc., 45 Arctic St., Worcester, Mass.							
Green Moditain Handy Hydrate.....	65.6	60.0	3.4	1.0	68.6	1372	5.7
Snow-Fluff Agricultural Lime Hydrate.....	69.9	70.0	3.6	5.0	72.2	1344	3.2
Sure Crop Agricultural Lime Hydrate.....	69.4	65.0	3.6	1.0	72.9	1458	5.8
A. H. Hoffman, Inc., Landisville, Penn.							
Hoffman Hydrated Lime.....	67.0	70.0	3.4	1.0	68.7	1374	4.4
Lee Lime Corporation, Lee, Mass.							
Lee Double Strength Agricultural Hydrated Lime.....	47.4	45.0	33.4	29.0	90.0	1800	3.4
Lee Hydrated Lime for General Purposes.....	47.6	45.0	34.5	29.0	90.6	1812	3.2
Tobey Agra Hydrate.....	38.8	35.0	28.0	25.0	74.1	1482	3.2
Limestone Products Corporation of America, Newton, N. J.							
Lime Crest Brand of Agricultural Hydrated Lime.....	71.8	70.0	2.8	1.0	74.2	1484	2.1
New England Lime Co., Adams, Mass.							
Nelco Agricultural Hydrated Lime (Adams).....	73.4	70.0	0.5	0.5	73.1	1462	3.1
Nelco Agricultural Hydrated Lime (Canaan, Conn.).....	44.8	47.0	32.3	31.0	85.7	1714	2.9
Nelco Land Lime (Canaan, Conn.).....	43.6	35.0	31.1	25.0	82.6	1652	3.5
United States Gypsum Co., 370 West Adams St., Chicago 6, Ill.							
Red Top Hydrate Lime (Farnams).....	68.5	70.0	1.9	trace	68.5	1370	3.8
USG Hydrate Lime — Agricultural (Farnams).....	71.0	70.0	1.4	trace	71.1	1422	3.7

Table II. Ground Limestone

Name of Manufacturer and Brand	Calcium Oxide (C+O)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter		Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	Finer than 100-mesh	Coarser than 20-mesh		
Alfred Minerals, Inc., Adams, Mass.										
Hoo-ac Agricultural Limestone.....	52.4	51.5	0.6	0.5	52.2	1044	6.4	60.3	1.1	
Lee Lime Corporation, Lee, Mass.										
Lee Pulverized Limestone.....	30.3	30.0	21.7	20.0	57.5	1150	3.1	53.9	.2	
Tobey Pulverized Limestone.....	43.0	35.0	9.6	7.0	55.1	1102	3.8	82.1	none	
Limestone Products Corporation of America, Newton, N. J.										
Lime Crest Brand of Calcite Pulverized.....	48.8	42.0	2.2	2.0	50.5	1010	9.2	80.5	.4	
Clifford L. Miller Estate, West Stockbridge, Mass.										
Monarque Agricultural Limestone.....	46.3	39.0	0.2	11.0	53.4	106.8	5.7	59.4	1.0	
New England Lime Co., Adams, Mass.										
Nedco Agricultural Ground Limestone (Canaan, Conn.)....	30.7	30.0	21.1	21.0	58.5	1170	3.6	70.9	.4	
United States Cypsum Co., 360 West Adams St., Chicago 6, Ill.										
USG Agricultural Limestone (Farnams).....	55.1	50.5	1.2	0.25	55.4	1108	4.2	81.4	none	
USG Agricultural Limestone (Falls Village, Conn.).....	31.2	30.0	21.3	20.0	58.5	1170	2.3	28.1	2.5	

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1947**

Acme Guano Co., 411 National Marine Bank Bldg., Baltimore 2, Md.
 Agricultural Laboratories, Inc., 1145 Chesapeake Ave., Columbus, Ohio
 Allied Chemical & Dye Corporation, The Barrett Division, 40 Rector St., New York, N. Y.
 American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St. at St. Clair, Marietta, Ohio
 American Potash & Chemical Corporation, 122 East 42nd St., New York 17, N. Y.
 Apothecaries Hall Co., Waterbury 88, Conn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Atkins & Durbrow, Inc., 165 John St., New York, N. Y.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Berkshire Chemical Co., 92 Howard Ave., Bridgeport, Conn.
 Joseph Breck & Sons Corp., 85 State St., Boston 9, Mass.
 W. Atlee Burpee Co., Hunting Park Ave. at 18th St., Philadelphia 32, Penn.
 California Stucco Products of N. E., Inc., 169 Waverly St., Cambridge, Mass.
 Chamberlin & Barclay, Inc., Cranbury, N. J.
 Clean Nitrate Sales Corporation, 170 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Rose Daniels, Inc., 1217 High St., Des Moines, Iowa
 Davey Tree Expert Co., 117 South Water St., Kent, Ohio
 Davison Chemical Corporation, 20 Hopkins Place, Baltimore, Md.
 Doggett-Pfeil Co., 642 Morris Turnpike, Springfield, N. J.
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.
 Eastern States Fertilizer Exchange, Inc., 95 Elm St., West Springfield, Mass.
 Essex County Co-operative Farming Association, South Main St., Topsfield, Mass.
 Excell Laboratories, 2623 Indiana Ave., Chicago, Ill.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Ford Motor Co., 3006 Schaefer Road, Dearborn, Mich.
 Frost & Higgins Co., 20 Mill St., Arlington, Mass.
 Glendale Poultry Farm, Somerset, Mass.
 Goulard & Olena, Inc., Skillman, N. J.
 A. H. Hoffman, Inc., Landisville, Penn.
 Humphreys-Godwin Co., Memphis 3, Tenn.
 Hydroponic Chemical Co., Inc., 315 West 39th St., New York 18, N. Y.
 Hy-Tons Corporation, 3 Green St., Woburn, Mass.
 International Minerals & Chemical Corporation, Woburn, Mass.
 Kerr Manufacturing Co., Everett, Mass.
 L. B. Lovitt & Co., Memphis, Tenn.
 McCormick & Co., Inc., 414 Light St., Baltimore, Md.
 Miller Chemical & Fertilizer Corporation, 1000 South Caroline St., Baltimore 31, Md.
 Norwood Brand Fertilizer Co., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., 28 Sugarloaf St., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 F. G. Phillips Co., 253 Cedar St., Dedham, Mass.
 Plantabbs Corporation, 1 West Biddle St., Baltimore 1, Md.
 Plantsmilt Products Co., 1072 West Side Ave., Jersey City 6, N. J.
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago 9, Ill.
 Ralston Purina Co., St. Louis 2, Mo.
 Ra-Pid-Gro Corporation, Dansville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck & Co., 925 S. Homan Ave., Chicago 7, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
 M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave. & Venango St., Philadelphia 34, Penn.
 Smith Agricultural Chemical Co., 619 N. Champion Ave., Columbus, Ohio
 Stockdale Fertilizer Co., Morris, Ill.
 Switt & Company Plant Food Division, 25 Faneuil Hall Square, Boston 9, Mass.
 Tennessee Corporation, Lockland, Cincinnati 15, Ohio
 Tennessee Corporation, 621 Grant Bldg., Atlanta 1, Ga.
 Universal Chemical Co., 106 Ontario St., Lynn, Mass.
 Walker-Gordon Laboratory Co., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro, Mass.
 Woodruff Fertilizer Works, North Haven, Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 134

JULY, 1947

**Twenty-seventh Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

A total of 1,271,378 samples, representing 651 chicken and turkey flocks, was tested during the 1946-47 testing season. The average percentage of positive tests was 0.13. A slight increase in the volume of testing over the previous season was noted. It is gratifying to observe that 95 percent of all the birds tested are in 100 percent tested non-reacting flocks. The Massachusetts poultry industry is to be complimented upon having such a large percentage of birds in non-reacting flocks.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

TWENTY-SEVENTH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1946-47

By the Poultry Disease Control Laboratory¹

INTRODUCTION

During the 1946-47 season an increase in the volume of tests over the previous season was noted. The Massachusetts poultry industry is continuing its progress in eliminating the disease from its flocks. Approximately 95 percent of the total birds tested are in 100 percent tested non-reacting flocks. This accomplishment is placing the industry in a very favorable position from the standpoint of selling hatching eggs and stock which are free of pullorum infection.

During the past year the laboratory has put forth every effort to meet the testing demands. This was accomplished in part by increased personnel on the permanent staff and by obtaining blood collectors more readily. However, the volume of the work has increased beyond the point where the laboratory facilities are adequate. It is hoped that this situation will be corrected when the proposed new laboratory becomes a reality.

Appreciation is extended to the poultrymen who have cooperated by having part or all of their birds tested early in the season. This has been a distinct help in relieving some of the congestion during the peak testing months of November, December, and January.

We also wish to express appreciation for the help and cooperation received from the Extension Service, Massachusetts Department of Agriculture, and other agencies in the program to eliminate pullorum disease from Massachusetts poultry flocks.

SUMMARY OF SERVICE RENDERED

Applications received.....	687
Applications cancelled.....	36
Flocks tested.....	651
Chicken flocks.....	562
Chicken and turkey flocks.....	11
Turkey flocks.....	78
Number of tests.....	1,271,378
Chickens:	
Routine.....	1,225,184
Experimental.....	13,799
Fowl other than chickens:	
Routine.....	31,802
Experimental.....	593
Owners receiving necropsy service.....	114*
Necropsies of reacting birds.....	211**

*Includes 5 turkey, 1 pheasant, and 1 game flocks.

**Includes 7 turkeys, 3 pheasants, and 1 game

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor; K. L. Bullis, Research Professor; G. H. Snoeyenbos, Research Professor; O. S. Flint, Assistant Research Professor; F. G. Spieling, Assistant Research Professor; Miriam K. Clarke, Research Assistant; O. M. Olesiuk, Research Assistant; E. M. Allen, Research Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

Table 1. Distribution of Tests and Reactors by Counties and by Breeds

Breeds	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Suffolk	Worcester	TOTALS	Percent Positive Tests
Rhode Island Reds	5,741	5,482	94,679	169	68,232	17,072	19,178	25,067	96,373	132,897	66,691	509	124,237	656,327	0.12
Positive tests.....	75	0	346	0	6	0	0	102	37	84	54	0	47	758	
Barred Plymouth Rocks	2,536	9,861	34,234	2,498	18,244	28,018	9,343	13,012	47,076	18,892	45,453		38,314	267,481	0.19
Positive tests.....	0	0	20	0	3	65	269	161	1	8	39		12	518	
New Hampshires	14,811	2,564	25,052		44,059	1,537	1,402	4,717	66,255	10,654	71,298		12,017	254,456	0.11
Positive tests.....	0	0	178		19	0	0	0	31	6	51		1	286	
White Plymouth Rocks					1,888	1,563	241	2,771	8,149	3,164	10,756		3,315	31,847	0.04
Positive tests.....					0	0	0	0	4	0	8		0	12	
White Leghorns		3,769	412		6,773									10,954	0.00
Positive tests.....		0	0		0									0	
Miscellaneous	148	383	3,342		2,743	3	69	44	5,573	2,372	2,617		624	17,918	0.39
Positive tests.....	0	0	1		2	0	0	0	0	0	2		65	70	
Total Tests.....	23,236	22,059	157,719	2,667	141,939	48,193	39,323	45,611	223,436	167,979	196,815	509	178,507	1,238,983	
Positive Tests	75	0	545	0	30	65	216	263	73	98	151	0	125	1,644	0.13
Percent.....	0.32	0.00	0.35	0.00	0.02	0.13	0.71	0.58	0.03	0.06	0.08	0.00	0.07		

DISTRIBUTION OF TESTS AND REACTORS

Table 1 gives the number of tests and reactors by counties. The 1,238,983 samples tested showed only 0.13 percent reactors. Flocks owners in thirteen counties were given testing service. No reactors were detected among birds tested in three counties (Berkshire, Dukes, and Suffolk); while five counties (Essex, Middlesex, Norfolk, Plymouth, and Worcester) each had less than 0.1 percent reactors. Middlesex, Plymouth, Worcester, Norfolk, and Bristol counties led in the number of samples tested, all exceeding 150,000.

The following breeds were tested: Bantam, Barnevelder, Barred Plymouth Rock, Brahma, Columbian, Crosses, Cornish, New Hampshire, Rhode Island Red, Silver Faverolles, White American, White Leghorn, White Plymouth Rock, and White Wyandotte. The predominant breeds are Rhode Island Red, Barred Plymouth Rock, and New Hampshire. Of the total samples, 52.9 percent were taken from the Rhode Island Red, 21.5 percent from the Barred Plymouth Rock, 20.5 percent from the New Hampshire, and the balance from the other breeds listed.

Of the 1,125,574 samples collected from females, 60,098 were from hens and 1,065,566 from pullets, with 0.03 and 0.14 percent reactors, respectively. The 113,409 samples collected from males gave 0.07 percent positive tests.

ANNUAL TESTING OF FLOCKS

The results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years are given in Table 2.

The 93 flocks tested for the first time represented 96,580 tests of which 0.23 percent were positive. In this group, 85 flocks containing 88.8 percent of the birds, were found to be non-reacting, and 8 flocks were positive. The average number of birds per flock was 990.

The group tested intermittently was the smallest of the four, both in number of flocks and in number of birds tested; and the average percentage of positive tests was the highest. Six of the flocks were positive; and 33, representing 89.2 percent of the birds, were non-reacting. The average number of birds per flock was 1,847. These results substantiate previous observations which indicate that intermittent testing is not a sound procedure in establishing or maintaining a pullorum-free flock.

In the group tested for two consecutive years, 86 flocks were non-reacting and 4 were positive. The average percentage of infection was smaller than in the first two groups. Approximately 96.7 percent of the birds tested in this group are in non-reacting flocks. The average number of birds per flock was 2,304.

The group tested for three or more consecutive years was by far the largest of the four groups and showed the smallest percentage of positive tests. A total of 330 non-reacting flocks was detected, which contained 97.5 percent of the birds in this group. The average flock size was 2,307 birds. These results show that flocks which were tested annually have made more progress in pullorum eradication than flocks tested for the first time or intermittently.

For the four groups as a whole, 562 flocks were tested, representing 1,156,147 birds, and 1,238,983 samples of which 0.13 percent were positive. The 515 flocks which were 100 percent tested and non-reacting contained 1,098,417 birds, or 95 percent of the total birds tested. The 28 flocks classified as positive represented 44,104 birds or 3.81 percent of the total birds tested.

It should be mentioned that 103 or 20 percent of the flocks tested in 1945-46 did not test this season. This is more than dropped out the previous season.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially Tested	100% Tested	Partially Tested
Flocks tested—									
For the first time.....	93	92,142	96,580	223	0.23	76	9	6	2
Intermittently.....	39	72,051	75,528	276	0.37	31	2	4	2
Two consecutive years.....	90	207,367	218,446	474	0.22	82	4	4	—
Three or more consecutive years	340	784,587	848,429	671	0.08	326	4	8	2
Totals.....	562	1,156,147	1,238,983	1,644	0.13	515	19	22	6

It is hoped that in the future flocks will be tested annually, for intermittent testing is not a sound procedure for the establishment or maintenance of pul-
lorum-free flocks.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

Reactors were found in seventeen flocks which had been non-reacting the previous season. Table 3 gives the testing results for these flocks. Five flocks had been negative for one year, five for two years, two for three years, and the remaining five for four, six, eight, eleven, and fourteen years, respectively.

Nine flocks had less than 0.5 percent reactors on the first test. Two flocks had more than 3 percent reactors. Twelve flocks obtained a negative test through partial or 100 percent retests. The majority were negative after one retest. One flock failed to obtain a negative test through retesting. Four flocks were not retested. In nine flocks the source of the infection was unknown. In the other eight flocks the infection was attributed either to the purchase of questionable stock or to failure in observing adequate preventive measures.

The matter of "breaks" has been of concern to flock owners and those persons associated with testing programs. The following summary gives the incidence of "breaks" among Massachusetts-tested flocks for the past eight years.

Year	Number of Flocks	Breaks		Flocks with less than 0.5 percent infection on first test	
		Number	Percent	Number	Percent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	56.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94

It will be noted that the incidence of "breaks" increased during the war years and has been on the decline since the end of the war. Just what factors played a role in this increase is a matter of conjecture. It is hoped that the number of "breaks" can be kept to a minimum.

Flock owners and commercial hatcherymen should observe the following measures in order to establish and maintain a pullorum-free flock.

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.

Table 3. Appearance of Infection in Flocks Previously Negative

Flock	Number of Years Negative	1946-47 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	2	1,401	1,351	0.30	Unknown
		1,368	1,367*	0.00	
2	6	2,236	2,235	4.47	Purchased questionable stock
		706	703*	0.28	
		688	680*	0.00	
3	14	961	960	0.31	Unknown
4	1	1,523	1,520	0.92	Unknown
5	1	1,631	1,631	0.06	Purchased questionable stock
		1,630	305*	0.00	
		1,630	296*	0.00	
6	2	2,122	2,122	3.35	Purchased questionable stock
		1,268	1,268*	0.00	
		1,230	1,230*	0.00	
		1,215	455*	0.00	
7	2	2,011	2,011	0.20	Unknown
		1,902	1,901*	0.00	
8	4	2,295	2,295	0.26	Unknown
		2,024	1,722*	0.25	
		1,549	1,549*	0.00	
		1,517	732*	0.00	
9	1	3,423	3,422	0.56	Purchased questionable stock
		3,252	3,252*	0.00	
10	2	1,903	1,902	0.11	Purchased questionable stock
		1,037	1,037*	0.00	
11	1	3,700	3,700	0.54	Unknown
12	2	338	338	0.30	Unknown
		306	306*	0.00	
13	1	1,698	1,698	0.65	Purchased questionable stock
14	8	3,438	3,438	0.32	Unknown
		3,300	1,481*	0.07	
		3,263	3,261*	0.18	
15	3	15,559	15,559	0.006	Unknown
		15,559	2,015*	0.00	
16	11	2,965	2,714	0.63	Inadequate preventive measures
		2,372	2,122*	0.00	
		1,927	1,926*	0.00	
17	3	3,796	3,794	0.55	Purchased questionable stock
		3,542	3,542*	0.00	

*Represents retests

3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.

4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.

5. The poultry houses, runs, and equipment, should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.

6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are re-admitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult your county agent regarding additions or replacements in your flock.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING OF FOWL OTHER THAN CHICKENS

During the past year 31,329 fowl other than chickens were tested, 18,831 of which were turkeys and 9,907 pheasants. The number of turkeys tested was less than in the previous season. The percentage of infection was also less, 0.51 as compared with 2.26. The following table summarizes the results of tested fowl other than chickens:

Fowl	Number Birds	Reactors		Number Tests	Reactors	
		Number	Percent		Number	Percent
Turkeys.....	18,831	25	.13	19,796	100	.51
Pheasants.....	9,907	4	.04	10,008	4	.04
Quail.....	2,197	0		2,197	0	
Game.....	222	1	.45	222	1	.45
Ducks.....	56	0		56	0	
Geese.....	100	0		100	0	
Guineas.....	14	0		14	0	
Owls.....	2	0		2	0	
Totals.....	31,329	30		32,395	105	

The majority of turkey flocks contained less than 200 birds. The following summary gives the range in flock sizes for the turkey flocks tested:

Size of Flock	Number of Flocks
0-50	25
51-100	9
101-150	15
151-200	4
201-500	27
501-1000	9
1001-2000	0
2001 and more	0

There was a considerable increase in the number of pheasants tested, due to recent State legislation requiring that pheasants must be tested for pullorum disease before liberation. In one instance pullorum infection was detected in breeding birds imported from a mid-western state.

Table 4. Non-reacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable.....	3	21,381	—	—	3	21,381
Berkshire.....	8	22,059	—	—	8	22,059
Bristol.....	69	125,797	5	4,422	74	130,219
Dukes.....	1	2,667	—	—	1	2,667
Essex.....	64	126,039	3	2,452	67	128,491
Franklin.....	26	39,373	—	—	26	39,373
Hampden.....	22	26,342	1	4	23	26,346
Hampshire.....	27	41,028	2	1,542	29	42,570
Middlesex.....	94	208,871	2	678	96	209,549
Norfolk.....	48	153,674	—	—	48	153,674
Plymouth.....	75	163,791	3	2,967	78	166,758
Suffolk.....	1	509	—	—	1	509
Worcester.....	77	165,886	3	1,561	80	168,447
Totals...	515	1,698,417	19	15,626	534	1,112,043
Positive Flocks						
Barnstable.....	—	—	1	1,855	1	1,855
Bristol.....	4	10,527	3	1,142	7	11,669
Essex.....	3	6,325	—	—	3	6,325
Hampden.....	2	2,189	—	—	2	2,189
Middlesex.....	5	6,936	1	1,524	6	8,460
Norfolk.....	2	4,700	—	—	2	4,700
Plymouth.....	2	3,350	—	—	2	3,350
Worcester.....	4	4,695	1	861	5	5,556
Totals...	22	38,722	6	5,382	28	44,104

NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4 the non-reacting and positive flocks are listed by counties. A total of 515 flocks, representing 1,098,417 birds, was 100 percent tested and non-reacting. Nineteen flocks, representing 13,626 birds were partially tested and negative. Middlesex, Worcester, and Plymouth counties have the largest number of birds in non-reacting flocks. Five counties, Berkshire, Dukes, Franklin, Hampshire, and Suffolk, had all their flocks classified as negative at the end of the testing season.

Twenty-eight flocks, representing 44,104 birds, were classified as positive. The number of positive flocks, and birds in those flocks, was slightly larger than in the previous season. With economic and working conditions returning to peace time status, it is hoped that the flock owners will be in a better position to maintain conditions which are conducive towards establishing and maintaining flocks free of pullorum disease. The flock owner and hatcheryman should recognize that they share the greater part of the responsibility for establishing and maintaining flocks free of pullorum disease. It is hoped that Massachusetts flock owners will strive to still further reduce the number of infected flocks in the State.

Table 5. Comparison of 1945-46 and 1946-47 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1945-46 Season					
Barnstable.....	3	6,446	7,959	0.06	2
Berkshire.....	8	13,958	15,515	0.67	6
Bristol.....	74	141,319	163,903	0.07	68
Dukes.....	1	2,435	2,435	0.00	1
Essex.....	68	141,613	147,877	0.009	68
Franklin.....	30	48,558	48,617	0.37	26
Hampden.....	27	32,293	34,763	1.01	25
Hampshire.....	33	44,517	48,189	0.54	30
Middlesex.....	96	206,412	224,109	0.05	94
Norfolk.....	39	140,158	156,982	0.06	38
Plymouth.....	69	162,486	181,818	0.10	66
Worcester.....	90	185,542	193,427	0.02	89
Totals.....	538	1,125,737	1,225,594	0.12	513
1946-47 Season					
Barnstable.....	4	23,236	23,236	0.32	3
Berkshire.....	8	22,059	22,059	0.00	8
Bristol.....	81	141,888	157,719	0.35	74
Dukes.....	1	2,667	2,667	0.00	1
Essex.....	76	134,816	141,939	0.02	67
Franklin.....	26	39,373	48,193	0.13	26
Hampden.....	25	28,535	30,323	0.71	23
Hampshire.....	29	42,570	45,611	0.58	29
Middlesex.....	102	218,069	223,426	0.63	96
Norfolk.....	50	158,374	167,979	0.06	48
Plymouth.....	80	170,168	196,815	0.08	78
Suffolk.....	1	509	509	0.00	1
Worcester.....	85	174,003	178,507	0.07	80
Totals.....	562	1,156,147	1,238,983	0.13	534

COMPARISON OF 1945-46 and 1946-47 TESTING

Table 5 gives a comparison of the 1945-46 and 1946-47 testing results for the different counties. Slight increases in the number of tested flocks, birds, tests, and non-reacting flocks were noted in some counties, while in other counties decreases were observed.

In 1946-47 the following increases were noted over the previous season: 24 flocks; 30,410 birds; 13,389 tests; and 21 non-reacting flocks.

The data in Table 5 reveal that Massachusetts is continuing its progress in eliminating pullorum disease from its flocks.

TWENTY-SEVEN YEAR TESTING SUMMARY

In Table 6 is given a twenty-seven year testing summary which shows continued progress in eliminating the disease from flocks. The percentage of positive tests has not exceeded 0.13 in the last four years, which is the lowest four years in the testing history of Massachusetts. Also the percentage of total tested birds in non-reacting flocks has not been below 90 during the last seven years.

Table 6 Twenty-Seven Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.97
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,033	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,693	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: This past year 39 flocks were classified with an intermittent testing history, which means that the flocks are not tested annually. Flocks in this category usually reveal a higher percentage of positive tests than flocks which are tested annually. Breeding flocks should be tested annually in order to establish sound breeding stock.

Furthermore, 25 flocks, representing 19,608 birds or 1.7 percent of the total birds tested, were only partially tested. While the total number of birds in partially tested flocks may be small, it is hoped that as the testing program progresses all flock owners will see the wisdom of having their entire flocks tested. It should be emphasized that when only part of the flock is tested, the flock owner is unable to determine the true pullorum status of all birds on the premises.

Annual testing of all birds on the premises, therefore, cannot be too strongly advocated or emphasized if pullorum-free flocks are to be established and maintained.

Early Testing: During the past year market outlets have required that hatching eggs or chicks from untested birds cannot be sold. This requirement has created a new situation in the pullorum testing work in that more birds will be tested during the summer months. Birds over five months of age are eligible for the test. This early testing means more split-flock testing. Poultrymen are cautioned about the dangers of permitting untested birds to escape their attention which may readily happen through split-flock testing. All unbanded birds should be either tested or removed from the flock.

Testing accommodations at the laboratory are limited. Flock owners who can have their birds tested during the summer and early fall months are advised to do so. This will help to relieve the congestion during the months when the demands are greatest.

Flock owners can further cooperate by filing their applications early so that the laboratory can make preparations regarding the testing work. Application cards are serviced in the order in which they are received unless circumstances suggest otherwise. In order to service applications money must be on deposit with the Treasurer of the University of Massachusetts. As a rule, the flock owner should have this money on deposit at least two weeks before the date of the test. This amount of time is necessary for economical routing of the blood collectors. After flock owners have determined the approximate testing date for their flocks, it would be advisable to send the money to the Treasurer of the University of Massachusetts so that the laboratory will not have to send a special request for money. When deposits have been made some time in advance, the flock owner often benefits by having his flock tested at an earlier date than expected because occasionally there are postponements which enable the laboratory to schedule other flocks on short notice.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES BULLETIN NO. 135 NOVEMBER 1947

Seed Inspection

By F. A. McLaughlin

This report, the twentieth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1947, by authority of Chapter 94 as amended by Chapter 377 of the Acts of 1946.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The Seed Testing Laboratory will allow ten units of work free of charge, during any calendar year, to any person residing or doing business in the Commonwealth.

Units are rated as follows:	Units
Purity analysis (red clover, timothy, etc.).....	1
Purity analysis (bluegrass, orchard grass, etc.).....	2
Purity analysis of a mixture of seeds (depending upon the number of kinds in the mixture)	4-10
Examination for noxious weeds (sample of 4 oz. or less).....	2
Identification of seed or plant.....	1
Cleaning tobacco seed (4 oz. or less).....	2
Germination test (4 x 100 seeds of any seed not chaffy or requiring purity analysis).....	1
Germination test (soil, 2 x 100 seeds).....	1
Germination test (chaffy grasses or seeds requiring purity analysis)	2

Fees for work in excess of the ten free units allowed to any person residing or doing business in the Commonwealth.

Germination test of all crop seeds except grasses.....	\$0.25
Germination test of timothy.....	.25
Germination test of all other grasses.....	.50
Purity analysis of cereals.....	.50
Purity analysis of timothy.....	.75
Purity analysis of all other grasses.....	1.00
Purity analysis of all other crop seeds.....	.75
Purity analysis of mixtures of not more than 2 kinds of agricultural seeds	1.00
Purity analysis of special mixtures, including lawn grasses and pasture mixtures — a charge sufficient to cover the actual cost of working the sample, depending entirely upon the character of the sample.	
Minimum charge.....	1.25

In no case will the final report be rendered until all fees are paid.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any one kind to be submitted for a germination test is 400.

SEED INSPECTION

By F. A. McLaughlin¹

Massachusetts Vegetable Seed Standards for 1948

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>)	60	Kale	75
Asparagus	*70	Kohlrabi	75
Bean, Lima	70	Leek	60
Bean, Scarlet Runner	75	Lettuce	80
Bean, Other Varieties	75	Muskmelon	75
Beet	65	Mustard	75
Broccoli	75	Okra	*50
Brussels Sprouts	70	Onion	70
Cabbage	75	Parsley	60
Cabbage, Chinese	75	Parsnip	60
Carrot	55	Peas	80
Cauliflower	75	Pepper	55
Celeriac	55	Pumpkin	75
Celery	55	Radish	75
Chard, Swiss	65	Rhubarb	60
Chicory	65	Rutabaga	75
Citron	65	Salsify	75
Collard	80	Sorrel	60
Corn, Sweet	75	Soybean	75
Cress, Garden or Curled	40	Spinach, Common	60
Cress, Water	35	Spinach, New Zealand	40
Cucumber	80	Squash	75
Dandelion	45	Tomato	75
Egg Plant	60	Tomato, Husk	50
Endive	70	Turnip	80
Fetticus (Corn Salad)	70	Watermelon	70

*Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds and the percentage of hard seed, if present, must be stated.

¹ Assisted by Miss Jessie L. Anderson, Instructor; Mrs. Phyllis Russell, Laboratory Assistant from December 1946 to July 1947; and Miss May J. Honnay, Clerk.

1947 Official Inspection of Agricultural Seeds

From November 1, 1946, to November 1, 1947, the Seed Laboratory received 6300 samples of seed, of which 894 were collected by the State Department of Agriculture and 5406 were sent in by seedsmen, farmers, and various state institutions. An additional lot of 229 samples of flower seeds, for field tests only, was received from the State Commissioner of Agriculture.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 6300 samples was 7202; 309 for purity and 6893 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
206 Field Crops for Purity and Germination.....	206	206
462 Field Crops for Germination Only.....	.....	462
2 Field Crops for Purity Only.....	2	.....
102 Lawn Mixtures for Germination Only, Germinations involving 436 ingredients.....	.....	436
82 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 362 Ingredients	82	362
19 Lawn Mixtures for Purity Only.....	19	.....
5268 Vegetables for Germination Only.....	.....	5268
7 Tree Seeds for Germination Only.....	.....	7
118 Tobacco Seeds for Germination Only.....	.....	118
34 Flower Seeds for Germination Only.....	.....	34
<hr/> 6300	<hr/> 309	<hr/> 6893

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested 325 samples of vegetable seeds and 229 samples of flower seeds, respectively.

The Seed Laboratory cleaned 118 lots of tobacco seed for Connecticut Valley farmers. The gross weight of the tobacco seeds was 97.60 pounds and the net weight for the cleaned seed was 78.13 pounds.

Explanation of Tables

Tables 1 - 3 contain seeds, the sale of which is regulated by Chapter 94 as amended by Chapter 377 of the Acts of 1946: Table 1, Agricultural Seeds as defined under Section 261 B1; Table 2, Mixtures of Agricultural Seeds as defined under Section 261 B1; and Table 3, Vegetable Seeds only, under provisions of Section 261 B2 and 261 C.

All samples were taken by an inspector from the State Department of Agriculture and were tested at the Seed Laboratory according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement. Mislabeling and other irregularities are emphasized by boldface type and explained in the final column of the table or in footnotes. The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

Table 4 is a summary, by wholesalers, of the total number of samples tested, showing how many were correctly labeled and how many were mislabeled.

Table 1.—Results of Inspection and Analyses of Field Seeds—Sections 261 B1 and 261 C.

Each lot of Agricultural Seeds must be labeled to show the commonly accepted name and variety, except that for Barley, Buckwheat, Oats, Rye and Wheat, when the variety is unknown the label shall bear the statement: "Variety Unknown." The label must also show lot number or other identification; percentage by weight, of pure seed; percentage, by weight, of inert matter; percentage, by weight, of weed seeds; percentage, by weight, of other agricultural seeds; percentage of (a) germination, exclusive of hard seeds, (b) hard seeds, if present; month and year germination test was completed; origin of Alfalfa, Red Clover and Field Corn (other than Hybrid), except if origin is unknown, it must be so stated; name and address of the person who labeled the seed, or who sells, offers or exposes such seed for sale and the names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams and 1 in 10 grams of the smaller seeds, and per pound when present in excess of 1 in 25 grams and 1 in 100 grams of the larger seeds. Secondary noxious weeds are dodder (*Cuscuta spp.*), horse nettle (*Solanum carolinense*), wild mustards (*Brassica spp.*), wild garlic and wild onion (*Allium spp.*), perennial sow thistle (*Sonchus arvensis*), corncockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*). Seed is prohibited from sale for having a false or misleading label; unless the test for germination has been completed within a nine months period or if it contains primary noxious weed seeds in excess of tolerance. Primary noxious weeds are Canada thistle (*Cirsium arvensis*), field bindweed (*Convolvulus arvensis*), and quack grass (*Agropyron repens*).

One hundred eighty samples of field crop seeds were analyzed in the laboratory. Results of analyses, however, are given only for samples which were mislabeled. In this table complete analysis is recorded; but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
933	Mangel	W. Atlee Burpee Co., Philadelphia, Pa. Herman Davis, Merrimac Prize Long Red, Lot No. (*)	L * F 99.66	—	* 0.34	—	75.00 78.00	1/1947 6/1947	*Required information not given.
S-188	Oats	Arthur R. Cone, Buffalo, N. Y. Belchertown State School, Belchertown **Vieland Type, No. 50 x 75	L 99.00 F 97.90	0.05 0.25	0.85 0.02	0.10 1.73	90.00 94.00	2/1947 4/1947	**Variety required unless there is a statement "Variety Unknown," Noxious weeds not declared, but 15 Brassica spp. per lb. found. Purity below that stated. Other Crop Seed excessive.

S-537 Bromo Grass	Danvers State Hospital, Hathorne No. 43-15	L 93.30 F 89.67	0.20 0.44	6.44 9.77	0.06 0.12	90.00 91.00	1/1947 6/1947	Noxious weeds not declared, but 10 Buckhorn Plantain per oz. found. Purity below that stated. Inert Matter excessive.
1015 Clover	General Mills, Farm Service Division, Lowell Medium Red, No. 50 x 685, Origin (*)	L 99.50 F 99.49	0.10 0.17	0.20 0.08	0.20 0.26	75-15 84-12	2/1947 7/1947	*Required information not given, Noxious weeds not declared, but 15 Buckhorn Plantain and 1 Brassica spp. per oz. found.
870 Redtop	Frank Howard, Inc., Pittsfield No. 30-163	L 97.00 F 93.92	0.40 0.09	2.50 5.99	0.10 —	90.00 94.00	3/1947 6/1947	Purity below that stated. Inert Matter excessive.
990 Corn	Sunshine Feed Stores, Ayer **Canada Flint Type, No. 83 x 234, Origin— N. Y.	L 99.50 F 99.80	— —	0.50 0.20	— —	90.00 63.00	3/1947 6/1947	**Variety required. "Type" not acceptable. Germination below that stated.
993 Corn	**Leaming Type, No. 80 x 205, Origin—Va. . . .	L 99.50 F 99.80	— —	0.50 0.20	— —	90.00 93.00	3/1947 6/1947	**Variety required. "Type" not acceptable.
1058 Corn	Sunshine Feed Stores, Greenfield **8-Row Flint, No. 83 x 234, Origin—N. Y. . . .	L 99.50 F 99.75	— —	0.50 0.25	— —	88.00 73.00	2/1947 6/1947	**Variety required. "8-Row Flint" not a variety. Germination below that stated.
1054 Timothy	No. 10 x 631	L 99.60 F 99.64	0.10 0.21	0.15 0.10	0.15 0.05	86.00 90.00	1/1947 7/1947	Noxious weeds not declared, but 58 Buckhorn Plantain per oz. found.
479 Clover	Worcester Grain & Coal Co., Worcester Medium Red, No. 15-648 B, Origin—Ind.	L 99.60 F 99.19	0.14 0.28	0.09 0.23	0.17 0.30	83-6 88-5	2/1947 7/1947	Noxious weeds not declared, but 21 Buckhorn Plantain per oz. found.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1065	Oats	Charles M. Cox Co., Boston, Mass. W. N. Potter Co., Huntington Wirthmore Brand, "Variety Unknown"	L 98.80 F 98.39	0.10 0.15	0.20 0.18	0.90 1.28	94.00 96.00	12/1946 6/1947	9 seeds of Quack Grass per lb. found. Primary noxious weed seeds excessive; sale prohibited.
1063	Vetch	Eastern States Farmers' Exchange, Springfield, Mass. Greenfield Farmers' Co-operative Exchange, Hairy, No. 1393	L 99.00 F 95.65	0.15 0.30	0.40 0.08	0.45 3.97	58-32 90-5	1/1947 6/1947	Purity below that stated. Other Crop Seed excessive.
845	Oats	George O. Moore & Co., Binghamton, N. Y. Hoosac Valley Coal & Grain Co., Adams **Swedish Type, Lot No. (*)	L 98.57 F 99.84	Trace 0.01	0.21 0.06	1.12 0.09	95.00 99.00	3/1947 6/1947	*Required information not given. **Variety required unless there is a statement "Variety Unknown," "Type" not acceptable.
743	Corn	The Page Seed Co., Greene, N. Y. Erikson Farm Supply Store, South Acton Westbranch Sweepstakes, No. 7001, Origin, Pa.	L * F 99.78	— —	* 0.22	— —	90.00 85.00	2/1947 6/1947	*Required information not given.
742	Oats	Marvel, No. J 8-9947	L 99.00 F 99.85	— 0.02	— 0.11	— 0.02	96.00 95.00	11/1946 6/1947	17 seeds of Quack Grass per lb. found. Primary noxious weed seeds excessive; sale prohibited.
S-417	Millet	Wm. G. Scarlett & Sons, Baltimore, Md. Grafton State Hospital, Grafton Japanese, No. 29171	L 97.00 F 97.11	1.90 2.00	1.00 0.68	0.10 0.21	85.00 74.00	1/1947 7/1947	Germination below that stated.
326	Millet	C. P. Washburn Co., Middleboro Hungarian, No. 8788	L 98.00 F 98.15	1.20 1.28	0.80 0.57	— —	80.00 52.00	10/1946 7/1947	94 Brassica spp. per oz. declared. 81 Brassica spp. per oz. found. Germination below that stated.
S-363	Fescue	Worcester State Hospital, Worcester N. Z. Chewings, No. 555	L 98.50 F 99.26	0.30 0.05	1.00 0.49	0.20 0.20	90.00 80.00	1/1947 7/1947	Germination below that stated.

173	Clover	Sears, Roebuck & Co., Chicago, Ill. Sears, Roebuck & Co., Boston White, No. OWC 85.....	L F	98.85 99.11	0.25 0.30	0.55 0.30	0.35 0.29	90.00† 80.11	1/1947 4/1947	Germination and hard seeds not stated separately.
174	Bluegrass	Sears, Roebuck & Co., Quincy Kentucky, No. OK 275.....	L F	85.60 84.45	0.75 0.25	13.55 15.21	0.10 0.09	70.00 56.00	1/1947 3/1947	Germination below that stated.
843	Timothy	Stonford Seed Co., Buffalo, N. Y. Hoosac Valley Coal & Grain Co., Adams No. 5040	L F	99.62 99.57	0.05 0.21	0.20 0.16	0.13 0.06	90.00 86.00	12/1946 7/1947	Noxious weeds not declared, but 12 Buckhorn Plantain per oz. found.
316	Millet	Whitney Seed Co., Buffalo, N. Y. Pierce Hardware Co., Taunton Hungarian, No. 48513.....	L F	99.16 97.93	0.68 1.92	0.16 0.15	—	88.00 83.00	1/1947 7/1947	Purity below that stated. Weed Seed excessive.
318	Redtop	No. 40447	L F	94.90 92.46	0.20 0.31	4.50 6.92	0.40 0.31	88.00 86.00	1/1947 6/1947	Purity below that stated. Inert Matter excessive.
560	Millet	H. K. Webster Co., Lawrence Japanese, No. 46520.....	L F	98.80 97.04	0.87 1.44	0.12 1.52	0.21 —	81.00 86.00	1/1947 7/1947	Purity below that stated. Weed Seed and Inert Matter excessive.
561	Orchard Grass	No. 3160	L F	90.06 90.29	1.10 1.21	8.79 8.50	0.05 —	90.00 88.00	2/1947 6/1947	Noxious weeds not declared, but 48 Buckhorn Plantain and 2 Wild Onion per oz. found.
1114	Corn	F. H. Woodruff & Sons, Milford, Conn. L. P. Adams Co., Dalton Westbranch Sweepstakes, No. 30341, Origin (*)	L F	* 100.00	— —	— —	— —	90.00 89.00	2/1947 6/1947	*Required information not given.
961	Corn	Farm Bureau Association, Waltham Westbranch Sweepstakes, No. 30341, Origin (*)	L F	* 99.90	— —	* 0.10	— —	90.00 89.00	2/1947 6/1947	*Required information not given.
962	Corn	Lancaster Surecrop, No. 30344, Origin (*).....	L F	* 99.80	— —	* 0.20	— —	90.00 95.00	2/1947 6/1947	*Required information not given.

† Including Hard Seeds.

Table 2.—Results of Inspection and Analysis of Mixtures of Agricultural Seeds—Sections 261 B1 and 261 C.

Each mixture of Agricultural Seeds shall be labeled to show the commonly accepted name and variety of each agricultural seed component in excess of five percent of the whole and the percentage, by weight, of each in the order of its predominance. The word "mixture" or the word "mixed" shall be shown conspicuously on the label. Other label requirements for Mixtures are the same as those for Field Seeds; hence are not repeated here, since they will be found under Table 1.

Forty-six Mixtures were received, but only nineteen were found to vary sufficiently from the label requirements to justify the statement of complete analysis in this table. Sixteen mixtures which did not list the kinds of seeds contained in the order of their predominance, omitted lot numbers, or did not state the percentage of other crop seeds are also included in this table. Items which are mislabeled, also the name and address of the wholesaler, are printed in boldface type.

Lab. No.	Wholesale Distributor, Brand Name, Lot Number, and Components of each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Components %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
703	Associated Seed Growers, Inc., New Haven, Conn. Field's Hardware, Chicopee Easy Grow Mixture, No. 42										Components not listed in order of predominance.
937	Arthur R. Cone, Buffalo, N. Y. F. Diehl & Son, Wellesley Shady Lawn Mixture, Lot No. (*)										*Required information not given. Components not listed in order of predominance.
169	General Mills, Farm Service Div., Attleboro Anchor Lawn Mixture, Lot No. (*)										*Required information not given. Components not listed in order of predominance. Other Crop Seed not declared, but 1.55% found.
881	C. F. Paige & Co., Athol Special Mixed Lawn Seed, No. AMS 81										Components not listed in order of predominance.
644	Doughten Seed Co., Jersey City, N. J. Farmers Co-operative Exch., Framingham Centre Sunnyside Lawn Mixture, No. 1047					L F 90.48	0.73 0.26	8.47 8.61	0.17 0.65	1/1947 6/1947	

Components:

Common Ryegrass	34.36	90.00	90.00
Timothy	26.34	80.00	80.00
Redtop	19.10	21.45	86.00
Kentucky Bluegrass	9.65	10.40	75.00
White Clover	1.18	2.00	87.00†
			62-37

Germination and hard seeds not stated separately.

952 **Farm Bureau Assoc., Waltham, Mass.**
Shady Spot Lawn Mixture, Lot No. (*)

*Required information not given.
Components not listed in order of predominance.

509 **Garden State Seed Co., Newark, N. J.**
Brocton Hardware & Supply Co., Brocton
Central Park Lawn Mixture, No. 251 A

Components not listed in order of predominance.

569 **Charles C. Hart Seed Co., Wethersfield, Conn.**
A. C. Freeman, Whitman
Green Park Mixture, No. C-47

Components not listed in order of predominance. Other Crop Seed not declared, but 0.42% found.

685 **Rocky's Hardware Co., Springfield**
Elm Tree Lawn Seed Blend, No. E-47

Components not listed in order of predominance.

Percentage exceeds that stated.

Components:			
Red Fescue	13.86	80.00	95.00
Highland Bent	4.75	85.00	—
Kentucky Bluegrass	5.60	80.00	80.00
Redtop, Fancy	36.70	90.00	—
Domestic Ryegrass	29.70	90.00	93.00
Agrostis spp. (Redtop and Highland Bent)	—	—	89.00
	23.74		

I — 0.53 8.86 — 3/1947
F 91.09 0.21 8.62 0.08 6/1947

177 **J. Oliver Johnson & Co., Chicago, Ill.**
Decatur Hopkins Co., Boston
West Park Mixture, No. LA 391

Components not listed in order of predominance. 1 Buckhorn per oz. Buckhorn Plantain excessive — 29 per oz. found.

I — 1.00 13.22 0.50 1/1947
F 90.26 0.53 10.37 0.84 5/1947

† Including Hard Seeds.

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number, and Components of each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Components %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
177	J. Oliver Johnson & Co., Continued Decatur Hopkins Co., Continued Components:										
	Timothy	49.50	49.33	80.00	76.00						
	Redtop, Fancy	13.50	16.02	90.00	80.00						
	Domestic Ryegrass	21.78	22.14	90.00	93.00						Germination below that stated.
	White Clover	0.50	0.77	75-15	68-25						Other Crop Seed not declared but 0.72% found.
180	Boulevard Mixture, No. LA 372					$\frac{L}{F}$ 94.33	0.40 0.33	5.79 4.62	$\frac{L}{F}$ 0.72	1/1947 5/1947	
	Components:										
	Kentucky Bluegrass	40.00	38.04	80.00	63.00						Germination below that stated.
	Redtop, Fancy	30.87	—	92.00	95.00						
	Domestic Ryegrass	14.70	16.03	90.00	95.00						Germination below that stated.
	Astoria Bent	5.39	—	90.00	62-28						
	White Clover	2.85	3.00	77-15	94.00						
	Agrostis spp. (Redtop and Astoria Bent)	—	37.26	—	—						Other Crop Seed not declared but 0.54% found.
178	Lincoln Park Mixture, No. LA 376										Other Crop Seed not declared but 1.04% found.
179	Shady Place Mixture, No. LA 384										Other Crop Seed not declared but 1.04% found.
450	D. Landreth Seed Co., Bristol 1, Pa. Frank L. Whitcomb, Amherst Landreth's Never Die Mixture, No. 42					$\frac{L}{F}$ 88.32	0.85 0.57	9.92 10.87	0.83 0.24	1/1947 5/1947	Components not listed in order of predominance.
	Components:										
	Redtop, Fancy	60.32	61.64	89.00	91.00						Percentage below that stated.
	Cheatings Fescue	9.90	9.08	90.00	90.00						Germination and hard seeds not stated separately.
	Kentucky Bluegrass	6.85	0.97	80.00	82.00						
	English Bluegrass	6.93	6.00	90.00	96.00						
	White Dutch Clover	4.40	4.79	92.00	73-23						
451	Canada Bluegrass Special Shady Lawn Mixture, No. 50		5.84	—	89.00	$\frac{L}{F}$ 97.70	0.65 0.27	7.13 1.89	0.25 0.14	1/1947 5/1947	Found but not declared.

Components: Percentage exceeds that stated.

Redtop, Fancy	33.52	43.85	88.00	91.00
Perennial Ryegrass	19.84	—	99.00	95.00
Chewings Fescue	14.85	—	90.00	94.00
Domestic Ryegrass	14.85	—	90.00	95.00
Poa Trivialis	8.91	—	93.00	93.00

John D. Lyon, Inc., Belmont, Mass.

Belchertown State School, Belchertown
Ladino Clover, No. XX, Origin Cal.

S-186

L	93.11	0.20	0.20	6.49	8/1946	950 Buckhorn Plantain per lb.
F	99.11	0.54	0.35	—	4/1947	1072 Buckhorn Plantain per lb.

Sold as Ladino Clover; **found to be a mixture of Ladino Clover and Timothy.**

Components:

Ladino Clover	93.11	93.36	81.5-6	78-6
Timothy	—	5.75	—	92.00

Worcester State Hospital, Worcester

Ladino Clover, No. (*), Origin Cal.

S-656

L	93.11	0.20	0.20	6.49	8/1946	*Required information not given.
F	99.13	0.51	0.36	—	7/1947	950 Buckhorn Plantain per lb.

Sold as Ladino Clover; **found to be a mixture of Ladino Clover and Timothy.**

Components:

Ladino Clover	93.11	92.17	81.5-6	82-4
Timothy	—	6.96	—	92.00

Pedigreed Seed Co., New York, N. Y.

Franklin Hardware Co., No. Attleboro
Marvel Green Mixture, No. NE 502-AMS 41

166

L	—	0.75	12.84	1.00	2/1947	Given formula exceeds 100%.
F	87.47	0.80	11.07	0.66	3/1947	Noxious weeds not declared, but 24 Buckhorn Plantain per oz. found.

Components:

Redtop, Fancy	42.45	38.75	90.00	92.00
Timothy	32.60	28.24	85.00	81.00
Domestic Ryegrass	13.86	14.44	90.00	93.00
Kentucky Bluegrass	6.50	0.87	80.00	84.00
Canada Bluegrass	—	5.17	—	93.00

Percentage below that stated.
Found but not declared.

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number, and Components of each Mixture, Dealer when other than Wholesale Distributor, and Place Collected		Components %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks	
	Label	Found	Label	Found	Label	Found							
167	Pedigreed Seed Co., Continued Century Park Mixture, No. NE 501-AMS 41						L F	— 92.35	0.90 0.65	9.75 6.35	1.00 0.65	2/1947 4/1947	Given formula less than 100%. Noxious weeds not declared, but 44 Buckhorn Plantain per oz. found.
	Components:												Germination below that stated.
	Timothy	37.50	40.47	90.00	77.00								
	Domestic Ryegrass	27.72	24.71	90.00	93.00								
	Redtop, Fancy	17.55	20.24	90.00	91.00								
	Meadow Fescue	5.00	5.82	90.00	94.00								
	White Clover	0.50	1.11	80.00	88.2								
384	Perry Seed Co., Boston, Mass. Franklin Park Lawn Mixture, Lot No. (*)												* Required information not given. Components not listed in order of predominance.
312	Philadelphia Seed Co., Philadelphia, Pa. Warren Hardware & Radio Co., Bramtree Splendorlawn Mixture, No. 802						L F	— 85.79	1.50 0.58	15.00 11.80	2.50 1.83	3/1947 5/1947	Components not listed in order of predominance. Noxious weeds not declared, but 14 Buckhorn Plantain per oz. found.
	Components:												
	Redtop	20.50	21.76	85.00	80.00								
	Chewings Fescue	8.00	6.81	80.00	97.00								
	Common Ryegrass	19.50	20.68	90.00	87.00								
	Canada Bluegrass	2.00	1.90	60.00	90.00								
	Timothy	31.00	34.63	75.00	80.00								
459	Wm. G. Scarlett & Co., Baltimore, Md. Centre Hardware Co., Roslindale Velvet Lawn Mixture, No. 28921						L F	— 90.69	0.80 0.69	11.00 8.00	0.40 0.62	2/1947 5/1947	Noxious weeds not declared, but 14 Buckhorn Plantain per oz. found.

460	Components: Redtop Ryegrass	50.00 22.50	55.54 19.65	90.00 80.00	91.00 52.00	"Ryegrass" not sufficient—Do- mestic Ryegrass found. Germina- tion below that stated.
	Kentucky Bluegrass Meadow Fescue White Clover	8.50 4.90 1.90	8.57 4.69 2.24	75.00 80.00 80.00	83.00 90.00 65-32	Germination and hard seeds not stated separately.
	Shady Spot Lawn Mixture, No. 29044.....					
		L	0.80	6.00	2/1947	
		F	0.67	7.12	5/1947	
	Components: Redtop Chewings Fescue	30.00 24.50	31.04 24.28	90.00 85.00	89.00 89.00	"Ryegrass" not sufficient—Do- mestic Ryegrass found.
	Ryegrass	19.80	19.38	90.00	90.00	
	Meadow Fescue Kentucky Bluegrass	14.70 4.20	12.75 4.49	85.00 80.00	91.00 81.00	
334	C. P. Washburn Co., Middleboro Greenway Mixture, No. 28884.....					
	Components: Redtop Chewings Fescue	39.80 19.60	17.12 22.83	90.00 85.00	79.00 92.99	"Ryegrass" not sufficient—Do- mestic Ryegrass found.
	Ryegrass	19.60	22.83	90.00	92.99	
	Kentucky Bluegrass Bentgrass	8.50 2.70	8.70 —	80.00 90.00	85.00 —	"Bentgrass" not sufficient—Colon- ial Bentgrass found. Germination and hard seeds not stated separately.
	White Clover Agrostis spp. (Redtop and Colonial Bent)	1.90 —	2.17 42.19	90.00 —	68-30 90.00	
171	Sears, Roebuck & Co., Chicago, Ill. Sears, Roebuck & Co., Boston Green Carpet Mixture, No. OD 252.....					Components not listed in order of predominance. Other Crop Seed not declared but 0.41% found.
172	Garden Master Shady Mixture, No. OD 260.....					Components not listed in order of predominance.

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number, and Components of each Mixture, Dealer when other than Wholesale Distributor, and Place Collected	Components %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found						
175	Sears, Roebuck & Co., Chicago, Ill.—Continued Sears, Roebuck & Co., Quincy Superfine Mixture, No. OD 254			L	—	5.65	—	1/1947	Other Crop Seed not declared but 0.49% found.
				F	91.11	0.20	0.21	0.49	4/1947	Inert Matter excessive. Germination below that stated.
	Components:								
	Kentucky Bluegrass	45.00	40.94				66.00		
	Redtop	29.40	—				80.00		
	Common Ryegrass	14.85	13.42				90.00		
	Creeping Bent	4.90	—				90.00		
	Agrostis spp. (Redtop and Astoria Bent)	—	36.75				—		
176	Robinhood Park Mixture, No. OD 255			L	—	5.55	1.00	1/1947	Components not listed in order of predominance.
				F	93.02	0.33	5.89	0.76		4/1947
	Components:								
	Kentucky Bluegrass	12.75	11.93				70.00		
	Chewings Fescue	14.70	14.24				80.00		
	Redtop	34.20	36.57				90.00		
	Domestic Ryegrass	29.40	27.45				90.00		
	White Clover	1.90	2.83				85.00		70-28
351	Stanford Seed Co., Buffalo, N. Y. Cutler Grain Co., Framingham Shady Spot Lawn Mixture, No. 5004 B			L	—	13.36	0.80	3/1947	Components not listed in order of predominance.
				F	84.45	0.54	14.54	0.47		5/1947
	Components:								
	Kentucky Bluegrass	8.45	7.17				80.00		
	Chewings Fescue	14.25	13.87				80.00		48.00
	Perennial Ryegrass	18.80	18.82				85.00		91.00
	Redtop	23.34	22.87				85.00		85.00
	Timothy	20.20	21.72				85.00		87.00
710	Faulkner Hardware Co., Palmer Honor Creeping Bent Mixture, No. 5100 B T								Components not listed in order of predominance. Other Crop Seed not declared, but 0.56% found.

844	Hoosac Valley Coal & Grain Co., Adams Timothy & Alsike Mixture, No. 5110.....	L F	96.45 —	0.50 0.90	1.50 1.52	1.58 1.13	12/1946 6/1947	450 Buckhorn Plantain per lb. 96 Buckhorn Plantain and 2 Dodder per lb. found.
	Components: Timothy..... Alsike Clover.....		78.44 18.01	80.00 75-16	83.00 62-16			Germination below that stated.
181	Ware Coal & Grain Co., Ware Liberty Lawn Seed Mixture, No. 5001-B.....							Components not listed in order of predominance.
635	Supple & Biddle Co., Philadelphia, Pa. Modern Oil Heat & Hardware Co., Marlboro Biddle Valley Green Lawn Mixture, No. 46.....	L F	88.09 —	0.72 1.06	11.51 10.79	0.64 0.06	1/1947 6/1947	
	Components: Redtop..... Timothy..... Domestic Ryegrass..... Kentucky Bluegrass..... White Dutch Clover.....		39.89 18.93 18.82 6.85 2.64	37.98 19.44 21.03 80.00 92.00	88.00 90.00 95.00 84.00 71-12			Germination below that stated. Percentage below that stated. Germination below that stated. Germination and hard seed not stated separately. Found but not declared.
	Canoda Bluegrass		6.24	—	94.00			Components not listed in order of predominance.
804	Vaughan Seed Store, New York, N. Y. C. H. Symmes & Co., Winchester Columbian Grass Mixture, No. 4740.....							Components not listed in order of predominance.
325	F. H. Woodruff & Sons, Milford, Conn. Waldron Hardware Co., Taunton Milford Green Mixture, No. C 4F 221.....							Components not listed in order of predominance.

Table 3.—Results of Inspection and Germination of Vegetable Seeds Sections 261 B 2 and 261 C.

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety and the name and address of the person who labeled such seed or who sells, offers or exposes it for sale. For seeds which germinate less than the Massachusetts Standard the label must also show the percentage of germination exclusive of hard seeds, percentage of hard seeds if present, calendar month and year the test was completed and the words "Below Standard" in not less than 8 point type. Date of test shall not be over nine months old, exclusive of the month in which the test was completed. Seed may not be sold or offered for sale which has a false or misleading label.

Six hundred and sixty-eight samples of vegetable seed were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of the law.

The wholesaler's name, in all instances, and the germination for those samples of seed found below standard in germination are in boldface type. Samples for which the found germination is not in boldface indicates the germination is above standard but below the germination stated.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Associated Seed Growers, Inc., New Haven, Conn.							
110 F	Spinach	Essex Co. Cooperative Farming Assoc., Topfield Bloomsdale Savoy Long Standing	68	11/1946	50	3/1947	60
W. E. Barrett Co., Providence, R. I.							
502	Lettuce	W. E. Barrett Co., Brockton May King			3	5/1947	80
W. Atlee Burpee Co., Philadelphia, Pa.							
356 F	Beans	Harding Street Grain Co., Worcester Giant Stringless Green Pod	85	*/1946	70	4/1947	75
Comstock, Ferre & Co., Wethersfield, Conn.							
164 F	Beans	Franklin Hardware Co., No. Attleboro Improved Golden Wax	95	12/1946	84-1	5/1947	75
Eastern States Farmers' Exchange, Springfield, Mass.							
293 F	Beans	Eastern States Farmers' Exchange, Montello Fordhook Bush Lima, No. V992.2	90	2/1947	72	5/1947	70
Charles C. Hart Seed Co., Wethersfield, Conn.							
851 F	Radish	Carr Hardware Co., Pittsfield Early Scarlet Globe, No. 6-56	85	1/1947	73	6/1947	75
692	Cabbage	Hamilton & Atwater Co., Westfield Drumhead Savoy, No. S-15	94	12/1946	77	5/1947	75
677	Parsley	Mason's Farm Market, Springfield Hamburg or Turnip Rooted, No. 6-1-20	75	12/1946	53	3/1947	60
161 F	Beans	Pierce Hardware Co., Taunton Tendergreen, No. M1-34	85	12/1946	69	4/1947	75
162 F	Beans	French Horticultural, No. 6-1-42	90	12/1946	78	4/1947	75
1	Cabbage	Drumhead Savoy, No. 15	84	12/1946	65	4/1947	75
8	Pepper	Hot Squash, No. 420	65	12/1946	39	4/1947	60

* Month not readable.

**Table 3.—Results of Inspection and Germination
of Vegetable Seeds.—Continued.**

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	%
		Charles C. Hart Seed Co., Cont.					
811	Onion	Seaverin's Store, No. Scituate White Globe	70	1/1947	45	5/1947	70
1009	Cabbage	Smith Hardware Co., Lowell Golden Acre, No. 5-2	90	12/1946	78	4/1947	75
		D. Landreth Seed Co., Bristol, Pa.					
927	Onion	F. B. Keene, Amesbury Ebenezer	75	.....	0	6/1947	70
		The Page Seed Co., Greene, N. Y.					
1121	Onion	Goshen Store, Goshen Southport Red Globe	App. 80	12/1946	33	6/1947	70
		Sears, Roebuck & Co., Chicago, Ill.					
908	Onion	Sears, Roebuck & Co., No. Cambridge Bunching Scallion	75	1/1947	55	6/1947	70
		Joseph Sordillo & Sons, Boston, Mass.					
265	Broccoli	White Cape .....	.....	.....	0	4/1947	75
		Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission)					
761	Parsnip	Washington School, Taunton Large Sugar or Hollow Crown .....	.....	.....	36	5/1947	60
		F. H. Woodruff & Sons, Milford, Conn.					
232 F	Spinach	J. H. Fairbanks Co., Bridgewater Round Thick Leaf, No. 29747 C	85	12/1946	70	5/1947	60
		General Mills, Farm Service Division, Lowell					
617 F	Beans	Plentiful, No. 1-6124	90	12/1946	57	5/1947	75
		General Mills, Farm Service Division, Middleboro					
241 F	Beans	Sure Crop Wax, No. 16743	90	12/1946	79	5/1947	75
563 F	Beans	Thornton & Crouch, Lawrence Davis Stringless Wax, No. 27802	90	3/1947	68	5/1947	75
568	Chicory	Magdelburg, No. 1-546	85	12/1946	68	6/1947	65
550 F	Beans	Treat Hardware Corp., Lawrence Top Notch Golden Wax, No. 2-886	90	12/1946	45	5/1947	75
551 F	Beet	Detroit Dark Red, No. 1-817	77	12/1946	62	5/1947	65
		S. D. Woodruff & Sons, Orange, Conn.					
S-362 F	Spinach	Worcester State Hospital, Worcester Summer Savoy, No. 4353	85	1/1947	68	4/1947	60

Table 4.—Summary of Inspection.

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Associated Seed Growers, Inc. New Haven, Conn.	30	29	1	4	4	0	1	0	1
Aubuchon, A. W., & Co. Fitchburg, Mass.	6	6	0						
Barrett, W. E., Co. Providence, R. I.	11	10	1						
Boston Market Gardener's Assoc. Boston, Mass.	2	2	0						
Breck, Joseph, & Sons Boston, Mass.	20	20	0	1	1	0	2	2	0
Brown, Alfred J., Seed Co. Grand Rapids, Mich.	7	7	0						
Burpee, W. Atlee, Co. Philadelphia, Pa.	32	31	1	1	0	1			
Butler Bros. Chicago, Ill.	3	3	0						
Comstock, Ferris & Co. Wethersfield, Conn.	48	47	1	2	2	0	2	2	0
Cone, Arthur R. Buffalo, N. Y.				43	34	9	3	0	3
Cox, Charles M., Co. Boston, Mass.				1	0	1			
Crosman Seed Corp. Rochester, N. Y.	10	10	0						
Dickinson, Albert, Co. Chicago, Ill.				1	1	0			
Doughten Seed Co. Jersey City, N. J.				3	3	0	1	0	1
Eastern States Farmers' Exchange Springfield, Mass.	23	22	1	20	19	1			
Empire Seed Co. Fredonia, N. Y.	9	9	0						
Farm Bureau Assoc. Waltham, Mass.							1	0	1
Ferry-Morse Seed Co. Detroit, Mich.	10	10	0						
Fredonia Seed Co. Fredonia, N. Y.	5	5	0						
Garden State Seed Co. Newark, N. J.							1	0	1
Grey, Thomas J., Co. Boston, Mass.	20	20	0						
Harris, Joseph, Co. Rochester, N. Y.	10	10	0						
Hart, Charles C., Seed Co. Wethersfield, Conn.	67	58	9	3	3	0	2	0	2
Hawkins, Budd D. Reading, Vt.	20	20	0						
Hygrade Seed Co. Fredonia, N. Y.	9	9	0						
Johnson, J. Oliver, & Co. Chicago, Ill.							4	0	4
Landreth, D., Seed Co. Bristol, Pa.	28	27	1				2	0	2
Lyon, John D., Inc. Belmont, Mass.							2	0	2
Mandeville & King Co. Rochester, N. Y.	4	4	0						
Michael-Leonard Seed Co. Chicago, Ill.	6	6	0						
Moore, George O., & Co. Binghamton, N. Y.				1	0	1			
Northrup, King & Co. Minneapolis, Minn.	12	12	0				1	1	0
The Page Seed Co. Greene, N. Y.	21	20	1	3	1	2	1	1	0
Pedigreed Seed Co. New York, N. Y.							3	1	2
Perry Seed Co. Boston, Mass.	17	17	0				1	0	1

Table 4.—Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Philadelphia Seed Co. Philadelphia, Pa.							1	0	1
Ralston Purina Mills St. Louis, Mo.	5	5	0						
Rice, J. B., Jr., Inc. Shushan, N. Y.	11	11	0						
Rice, Jerome B., Seed Co. Cambridge, N. Y.	1	1	0						
Ross Bros. Co. Worcester, Mass.	15	15	0	1	1	0	2	2	0
Scarlett, Wm. G., & Co. Baltimore, Md.				20	17	3	3	0	3
Sears, Roebuck & Co. Chicago, Ill.	13	12	1	2	0	2	4	0	4
Sordillo, Joseph, & Sons Boston, Mass.	7	6	1						
Stanford Seed Co. Buffalo, N. Y.				24	23	1	4	0	4
Sterling Seed Co. Minneapolis, Minn.	6	6	0						
Sunshine Feed Store Greenfield, Mass.				1	1	0			
Supple-Biddle Co. Philadelphia, Pa.							1	0	1
Templin Bradley Co. Cleveland, Ohio	10	9	1						
Varick, John B. Manchester, N. H.				1	1	0			
Vaughan's Seed Store New York, N. Y.	2	2	0				1	0	1
Whitney Seed Co. Buffalo, N. Y.	1	1	0	34	30	4	1	1	0
Woodruff, F. H., & Sons Milford, Conn.	74	67	7	8	5	3	1	0	1
Woodruff, S. D., & Sons Orange, Conn.	93	92	1	6	6	0	1	1	0
TOTALS	668	641	27	180	152	28	46	11	35

TYPE AND VARIETY STUDIES OF VEGETABLES**Conducted by the Department of Olericulture****W. H. Lachman, Assistant Research Professor****J. Fred Knowles, Jr., Student Assistant**

Tests are conducted by the Experiment Station each year to determine the trueness to type of various kinds of vegetable seeds which are offered for sale by the seedsmen and retailers in this state. The aim of this work has been to discourage the distribution of unfit or worthless seed. Samples of seed of rutabagas, turnips, carrots, radishes, beets, spinach, beans and sweet corn were purchased by the State Inspectors and sent to the Massachusetts Agricultural Experiment Station at Amherst, where the Department of Olericulture planted the seed in field test plots in order to compare plant characteristics with the labeled variety name. The trials of spinach were a failure due to adverse growing conditions; hence results are not recorded in this report.

Yield records were not taken because of the necessity of using small plots and also because replication of the plantings was not feasible due to the large number of strains and varieties that were in the test. Conformity to type has been the measure of comparison in these tests and individual plants have been called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration.

In studying the performance records it becomes evident that most of the stocks were true to name and most of them appeared to be highly productive. In a few instances it appeared that the variety had been misnamed or misrepresented but usually these were reasonably good substitutions. A number of the rutabagas were mixed with turnips and variation in tassel color of sweet corn indicates that more attention should be paid to detasseling in the production fields of hybrids. The quality of the beet stocks has been improving for several years, and carrots were also good. It was evident that a few cases of outright misrepresentation among the various stocks had taken place. It appears that much of this trouble results from some retailers, who are careless or do not realize the importance of not mixing the seed of various strains of vegetables.

Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., New Haven, Conn.				
922 F	Carrot	Duggan Supply Co., Newburyport Long Orange	98	2% very light colored
112 F	Beet	Essex Co. Cooperative Farming Assoc., Topsfield Asgrow Wonder	96	4% leafy—non-rooting type
391 F	Beet	Lindeloof Hardware Co., Stoughton Detroit Dark Red	91	9% flattened
670 F	Beet	Wells Hardware Co., Holyoke Early Blood Turnip	94	6% long top shape
A. W. Aubuchon & Co., Fitchburg, Mass.				
456 F	Radish	A. W. Aubuchon & Co., Spencer Sparkler White Tip	---	This is a mixture of not less than 5 different varieties.
W. E. Barrett Co., Providence, R. I.				
496 F	Beet	W. E. Barrett Co., Brockton Early Wonder	91	9% top shape
499 F	Carrot	Nantes Half Long Coreless	98	2% light colored
497 F	Radish	Cavalier	98	2% very light colored
Joseph Breck & Sons, Boston, Mass.				
198 F	Beet	Beats All	92	8% light colored
199 F	Beet	Winter Keeper	94	6% green tops
195 F	Corn	Bantam Crosby, No. 5725	80	20% tall later plants
206 F	Radish	French Breakfast, No. 6772-19	94	2% very light colored—4% tapered
207 F	Radish	White Icicle, No. 6794-17	98	2% purple tops
Norwood Hardware & Supply Co., Norwood				
222 F	Beet	Detroit Dark Red, No. 5279	96	2% short spindle shape— 2% light colored
223 F	Beet	Edmand's Blood Turnip	96	2% light colored—2% spindle shape
Alfred J. Brown Seed Co., Grand Rapids, Mich.				
401 F	Beet	Alden's, Inc., Campello Early Blood Turnip	90	2% obovate—2% very flat— 6% spindle shape
W. Atlee Burpee Co., Philadelphia, Pa.				
751 F	Rutabaga	Clinton Hardware & Auto Supply Co., Clinton Burpee's Purple Top Yellow	98	2% turnips
354 F	Beet	Harding Street Grain Store, Worcester Detroit Dark Red	90	6% spindle shape— 4% flattened
358 F	Beet	Improved Blood	94	6% spindle shape
Comstock, Ferre & Co., Wethersfield, Conn.				
262 F	Beet	Frank Cardoza, New Bedford Early Wonder Green Top	84	6% very light colored— 10% long top shape
Essex Co. Cooperative Farming Assoc., Topsfield				
118 F	Corn	Carmel Cross	88	12% off type
Franklin Hardware Co., Attleboro				
164 F	Bean	Improved Golden Wax	98	2% flat green podded type
165 F	Beet	Detroit Dark Red	90	10% flattened
W. C. Fuller Co., Mansfield				
286 F	Carrot	Danvers Half Long Improved	98	2% white roots
G. W. Gardiner & Sons, Fall River				
132 F	Beet	Early Wonder	86	6% long top shape— 8% deep globe
138 F	Beet	Perfected Detroit	90	10% flattened
136 F	Carrot	Improved Long Range	98	2% light colored

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Comstock, Ferre & Co., Cont.				
258 F	Beet	A. E. Wordel, New Bedford Detroit Dark Red	92	2% flattened— 6% long top shape
Crosman Seed Corp., East Rochester, N. Y.				
854 F	Beet	Berkshire Hardware & Plumbing Supply Co., Pittsfield Detroit Dark Red Perfected	98	2% very light colored
855 F	Carrot	Improved Long Orange	96	4% light colored
F. E. Ryan, Chester				
1066 F	Radish	White Strasburg	98	2% purple tops
Eastern States Farmers' Exchange, Springfield, Mass.				
94 F	Beet	Eastern States Farmers' Exchange, Waltham Detroit Dark Red	94	4% flattened—2% light colored
Ferry Morse Seed Co., Detroit, Mich.				
546 F	Beet	Stoneham Paint & Hardware Supply Co., Stoneham Detroit Dark Red, Morse's Strain	92	8% very flattened
549 F	Beet	Crosby Egyptian	92	8% spindle shape
Fredonia Seed Co., Fredonia, N. Y.				
658 F	Beet	Langer Hardware Co., Oxford Early Eclipse	90	10% long top shape
660 F	Radish	Early Scarlet Globe	96	2% light colored—2% white tip
Thomas J. Grey Co., Boston, Mass.				
598 F	Beet	Early Wonder	96	2% light colored—2% spindle shape
Joseph Harris Co., Rochester, N. Y.				
786 F	Beet	Joseph Harris Co., Lexington Detroit Dark Red	98	2% spindle shape—excellent type
788 F	Radish	Comet, No. 856	96	4% very light color
Charles C. Hart Seed Co., Wethersfield, Conn.				
851 F	Radish	Carr Hardware Co., Pittsfield Early Scarlet Globe	92	2% white tips—6% purple roots
146 F	Beet	C. F. Jordan Hardware Co., Bridgewater Detroit Dark Red	88	4% very light colored— 8% flattened
916 F	Radish	Lunt & Kelley, Inc., Newburyport Scarlet Globe, 6-56	92	8% long tapered roots
313 F	Beans	Pierce Hardware Co., Taunton Plentiful	80	20% vining type plants
Budd D. Hawkins, Reading, Vt.				
483 F	Carrot	Elwood Adams, Inc., Worcester Improved Long Orange	98	2% light colored
630 F	Beet	Hanley's Hardware Store, Marlboro Early Wonder	92	8% spindle shape
875 F	Radish	Home Supply Co., Orange New French Breakfast	94	6% very long tapering roots
Hygrade Seed Co., Fredonia, N. Y.				
306 F	Beet	Abraham Lincoln School, East Braintree Crosby's Egyptian	98	2% spindle shape
D. Landreth Seed Co., Bristol, Pa.				
123 F	Beet	Bedford Hardware Co., Fall River Detroit Dark Red	98	2% flattened
124 F	Beet	Early Large Blood Turnip	94	4% deep globe—2% very light colored
480 F	Beet	Elwood Adams, Inc., Worcester Crosby's Egyptian, No. 201	84	12% long top—4% spindle shape

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Mandeville & King Co., Rochester, N. Y.				
1069 F	Radish	Dresser Hull Co., Lee Scarlet Globe	98	2% light colored
288 F	Rutabaga	W. C. Fuller Co., Mansfield American Purple Top	86	14% turnips
The Page Seed Co., Greene, N. Y.				
233 F	Corn	J. H. Fairbanks Co., Bridgewater Golden Rush Hybrid, No. B 273847	85	15% short off-type plants
216 F	Beet	Shamut Farmers' Exchange, Millis Crosby's Egyptian	98	2% long top shape
219 F	Beet	Early Wonder	98	2% obovate
Perry Seed Co., Boston, Mass.				
372 F	Beet	Crosby's Improved Egyptian	88	12% long top shape
Ralston Purina Mills, St. Louis, Mo.				
346 F	Beet	Checkerboard Feed Store, Franklin Early Egyptian	94	6% top shape
J. B. Rice, Jr., Inc., Shushan, N. Y.				
605 F	Beet	Thompson Hardware Co., Lowell Early Blood Turnip	96	4% spindle shape
606 F	Carrot	Improved Long Orange	92	4% short top shape—4% light colored
Ross Bros. Co., Worcester, Mass.				
736 F	Carrot	Erickson Farm Supply Store, So. Acton Danvers Half Long	96	4% very light colored
430 F	Beet	Ross Bros. Co., Worcester Detroit Dark Red	90	10% flattened
431 F	Radish	French Breakfast	92	8% globe shape
Sears, Roebuck & Co., Chicago, Ill.				
901 F	Beet	Sears, Roebuck Co., Cambridge Detroit Dark Red	90	10% flattened roots
Joseph Sordillo & Sons, Boston, Mass.				
264 F	Carrot	Oxheart	---	These are not Oxheart but
270 F	Radish	Black Spanish Round	98	Improved Long Orange 2% Scarlet White Tip
Sterling Seed Co., Minneapolis, Minn.				
94 F	Beet	W. T. Grant Co., Weymouth Extra Early Flat Egyptian	---	100% true, but very poor type
The Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission)				
765 F	Beet	Washington School, Taunton Crosby's Egyptian	86	4% very light colored— 10% spindle shape
F. H. Woodruff & Sons, Milford, Conn.				
672 F	Turnip	Carlisle Hardware Co., Springfield Yellow Globe	95	5% purple tops
289 F	Beet	H. J. Croteau & Co., Northampton Detroit Dark Red, No. 1-817 C.....	96	4% long top shape
240 F	Beans	General Mills, Farm Service Division, Middleboro Burpee's Stringless Green Pod	98	2% very short stubby podded plants
241 F	Beans	Surecrop Wax, No. 16743	98	2% vining type plants
862 F	Carrot	The Hardware Shop, Adams Long Orange	94	6% light lemon color
889 F	Radish	Highland Hardware Co., Athol French Breakfast	94	2% dark purple color— 4% Scarlet Globe type

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
F. H. Woodruff & Sons, Continued				
252 F	Beet	Lemlin Hardware Co., New Bedford Detroit Dark Red 9-7234 C.....	84	14% long top shape—2% purple very light color
226 F	Beet	Town Square Hardware Co., Norwood Early Blood Turnip, No. 9-7237-C	92	4% light colored— 4% deep globe shape
227 F	Beet	Crosby's Egyptian, No. 1-557 C.....	84	2% very light colored— 14% long top shape
551 F	Beet	Treat Hardware Co., Lawrence Detroit Dark Red, No. 1-817	92	8% flattened
S. D. Woodruff & Sons, Orange, Conn.				
S-49 F	Beet	Danvers State Hospital, Hathorne Detroit Dark Red	88	12% flattened
S-41 F	Radish	Scarlet Globe	96	4% very dark purple
S-10 F	Beet	State Farm, So. Bridgewater Early Wonder	98	2% top shape
S-15 F	Rutabaga	L. I. Improved	94	6% turnips
601 F	Radish	Thompson Hardware Co., Lowell French Breakfast No. 2887	98	2% light colored roots
603 F	Rutabaga	L. I., No. 4247	80	20% turnips
S-283 F	Corn	Wrentham State Hospital, Wrentham Marcross 13.6, No. 74229	90	10% short inbred plants

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor
and

J. Fred Knowles, Jr., Student Assistant

For the twelfth season the Department of Floriculture has cooperated with the Seed Laboratory in conducting trials to determine the quality of flower seeds offered for sale in retail seed stores, hardware stores, chain stores, schools, and other retail outlets. The seeds, collected by the Seed Inspector, were tested in the field for germination and performance.

All seeds were sown on June 20. A second sowing was made, if seed was available, for those varieties which did not germinate with the first sowing. The results of the second test are indicated by the letter "D" in the table.

Seeds of 229 lots, representing 55 genera, packeted by 28 wholesale dealers or distributors and obtained from 56 retail sources, were grouped as follows:

Acroclinium	1	Dianthus	8	Papaver	4
Adonis	1	Dimorphotheca	1	Petunia	9
Ageratum	4	Eschscholtzia	3	Phacelia	1
Alyssum	7	Godetia	1	Phlox	6
Anchusa	1	Gomphrena	1	Portulaca	5
Antirrhinum	9	Gypsophila	2	Reseda	3
Aster (Machaeranthera)	1	Helianthus	1	Salpiglossis	2
Brachycome	2	Helichrysum	3	Salvia	3
Calendula	10	Iberis	7	Sanvitalia	2
Callistephus	14	Impatiens	2	Scabiosa	7
Celosia	2	Ipomoea	6	Schizanthus	1
Centaurea	4	Kochia	2	Tagetes	19
Cheiranthus	1	Linaria	1	Tithonia	2
Chrysanthumum	4	Lupinus	1	Tropacolum	2
Clarkia	3	Mathiola	2	Verbena	4
Cleome	1	Mirabilis	4	Vinca	2
Cosmos	10	Nemesia	1	Zinnia	21
Dahlia	3	Nemophila	1		
Delphinium	8	Nicotiana	3		
		Total.....			229

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, with only one-third or less of the plants not true to form or color; "fair" between one-third and two-thirds not true; and "not satisfactory" if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. Since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

A comparison of results of germination in 1946 and 1947 would seem to indicate that a lower quality of seed was offered this year.

Rating	1946		1947	
	Number of Lots	Percent of Total	Number of Lots	Percent of Total
Good	179	79.30	95	41.49
Fair	29	12.77	68	29.69
Poor	14	6.16	56	24.45
None	4	1.77	10	4.37
	<hr/> 226	<hr/> 100.00	<hr/> 229	<hr/> 100.00

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
W. E. Barrett Co., Providence, R. I.				
504 F	Callistephus	W. E. Barrett Co., Brockton		
505 F	Tagetes	Crego Crimson	None	
		Guinea Gold	Poor	Not satisfactory
Joseph Breck & Sons, Boston, Mass.				
463 F	Acroclinium	Sensation Giant Pink	Fair	Satisfactory
461 F	Alyssum	Carpet of Snow	Good	Satisfactory
462 F	Alyssum	Violet Queen	Good	Satisfactory
464 F-D	Antirrhinum	Large Flowered Giant Mixed	Good	Incomplete; had not flowered Sept. 30
467 F	Centaurea	Improved Cyanus Pinkie	Fair	Satisfactory
468 F	Cleome	Pink Queen	Fair	Satisfactory
469 F	Cosmos	Sensation Pink	Fair	Satisfactory
478 F	Delphinium	Chinese Blue Butterfly	Good	Satisfactory
470 F	Dianthus	Breck's Geisha Girl	Good	Satisfactory
466 F	Dianthus	Chabaud's Giant Mixed	Poor	Not Satisfactory
465 F	Iberis	Candytuft	Poor	Not Satisfactory
473 F	Nicotiana	Breck's Snowstorm	Poor	Not Satisfactory
474 F	Petunia	Ruffled Little Giant Mixed	Poor	Not Satisfactory
475 F	Phacelia	Campanularis. California Blue Bell	Good	Satisfactory
476 F	Phlox	Drummond Tall Mixed	Fair	Satisfactory; 6 colors
471 F	Tagetes	Harmony Double French	Good	Satisfactory
472 F	Tagetes	Sunset Giants Tall Double African Super Crown of Gold Pastel Tints Mixed	Good	Satisfactory
477 F	Zinnia	Mixed	Good	Satisfactory; 8 colors
Edward Fleming, Cohasset				
815 F	Chrysanthemum	Single Mixed	Good	Satisfactory
Needham Hardware Co., Needham				
936 F	Callistephus	Giant Comet Mixed	Good	Satisfactory; 2 colors
Alfred J. Brown Seed Co., Grand Rapids, Mich.				
Alden's, Adams				
400 F	Ageratum	Blue	Good	Satisfactory
399 F	Ipomoea	Heavenly Blue	Good	Satisfactory
W. Atlee Burpee Co., Philadelphia, Pa.				
Champion Stores, Inc., Waltham				
966 F	Calendula	Orange Fantasy	Fair	Satisfactory
964 F	Cosmos	Early Flowering Orange Flare	Good	Satisfactory
965 F	Cosmos	Sensation Mixed	Good	Satisfactory; 3 colors
Little Tree Farms, Framingham				
629 F-D	Calendula	Scotch Marigold	None	
627 F	Delphinium	Larkspur Giant Imperial Ruby	Fair	Satisfactory
628 F	Iberis	Candytuft Flesh Pink	Poor	Not satisfactory
Butler Bros. Co., Chicago, Ill.				
Ben Franklin Stores, Shelburne Falls				
830 F	Antirrhinum	Finest Mixed	Fair	Satisfactory; 4 colors
828 F	Dianthus	Annual Mixed	Good	Satisfactory; 4 colors
829 F	Zinnia	Super Giant Cherry Queen—Treated	Poor	Not satisfactory
Comstock, Ferré & Co., Wethersfield, Conn.				
Joseph Sordillo & Sons, Boston				
273 F-D	Callistephus	Giant Crego Comet Mixed	Poor	Not satisfactory
274 F-D	Dahlia	Unwins Dwarf Hybrids	Poor	Not satisfactory
275 F	Portulaca	Double Mixed	Good	Satisfactory; 4 colors
Crosman Seed Corp., East Rochester, N. Y.				
Berkshire Hardware & Plumbing Supply Co., Pittsfield				
861 F	Dianthus	Garden or Grass Pinks Mixed Colors	Good	Satisfactory; 7 colors
S. S. Kresge Co., Boston				
1035 F	Dianthus	Heddewigii Double Improved Strain	Good	Not satisfactory; all single except 1 plant

Flower Seed Inspection—Continued

No. Lab.	Seed Kind of	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Crosman Seed Corp., Cont.				
S. S. Kresge Co., Boston, Continued.				
1033 F	Helianthus	Sunflower Double Improved Strain	Good	Satisfactory; excellent strain
1034 F	Papaver	Shirley Mixed Colors	Good	Satisfactory; 7 colors
1032 F	Portulaca	Mixed Colors	Good	Satisfactory; 4 colors
S. S. Kresge Co., Quincy				
1025 F	Alyssum	Dwarf Pure White	Good	Satisfactory
1023 F-D	Antirrhinum	Snadragon Mixed. University of California Strain	Good	Incomplete; had not flowered Sept. 30
1020 F	Callistephus	Vick's Branching Mixed	Fair	Satisfactory; 2 colors
1016 F	Godetia	Duke of York. Double Rose or Crimson	Poor	Not satisfactory
1019 F	Linaria	Miniature Snadragon Mixed	Fair	Satisfactory; 5 colors
1022 F	Aster	Tahoka Daisy	Poor	Not satisfactory
1017 F	Petunia	Gen. Dodds	Good	Satisfactory
1024 F	Phlox	Drummond's Mixed	Poor	Not satisfactory
1026 F	Scabiosa	Tall Double Mixed	Poor	Not satisfactory
1018 F	Zinnia	Fantasy Mixed	Fair	Satisfactory; 5 colors
1021 F	Zinnia	Tiny Cupid Mixed	Fair	Satisfactory; 4 colors 40% tall
Deerington Gardens, Borgersville, Ind.				
F. W. Woolworth Co., Taunton				
780 F	Zinnia	Baby Bee Double Bloom Mixed	Fair	Satisfactory; 5 colors; 10% large flowers
779 F	Zinnia	Double Bloom Mixed Colors	Good	Satisfactory; 6 colors
Ferry-Morse Seed Co., Detroit, Mich.				
Lockhart Hardware Co., Natick				
938 F	Antirrhinum	Snadragon Giant Bedding	Fair	Satisfactory; 4 colors
939 F	Callistephus	Giant Crego Rose Pink	Fair	Satisfactory
942 F	Petunia	White King	Fair	Satisfactory
941 F	Verbena	Fine Mixed	Poor	Not satisfactory
940 F	Zinnia	Giant Double Crimson	Poor	Not satisfactory
Teddy's Hardware Co., Jamaica Plain				
721 F	Salvia	Bonfire	None	
722 F	Zinnia	All Giant. Pastel Shades	Poor	Not satisfactory
Fredonia Seed Co., Fredonia, N. Y.				
Bellingham Hardware Co., Weymouth				
1043 F	Alyssum	Benthami	Good	Satisfactory
1040 F	Calendula	Orange King	Fair	Not satisfactory; 4 types
1042 F	Cosmos	Orange Flare	Good	Satisfactory
1036 F	Gypsophila	Baby's Breath	Fair	Satisfactory
1044 F	Helichrysum	Strawflower Finest Mixed	Good	Satisfactory; 3 colors
1041 F	Iberis	Candytuft Finest Mixed	Good	Satisfactory; 4 colors
1045 F	Kochia	Mixed Fine Breck's Summer Cypress	None	
1037 F	Mathiola	Stock Finest Mixed Double	Poor	Not satisfactory
1038 F	Papaver	Shirley Double Finest Mixed	Good	Satisfactory; 5 colors
1039 F	Scabiosa	Mixed	Poor	Not satisfactory
Frank J. Wells, Charlemon				
833 F	Callistephus	Tall Branching Mixed	Fair	Satisfactory; 3 colors
Wood Square Hardware Co. Hudson				
754 F	Alyssum	Benthami Sweet	Good	Satisfactory
753 F	Eschscholtzia	California Poppy Finest	Good	Satisfactory
755 F	Mirabilis	Four O'Clocks Finest Mixed	Fair	Satisfactory; 3 colors
752 F	Zinnia	Giant Orange	Poor	Not satisfactory
Genesee Valley Seed Co., Dalton, N. Y.				
S. S. Kresge Co., Boston				
1029 F	Calendula	Campfire	Fair	Not satisfactory; 4 types
1031 F	Dianthus	Laciniatus	Poor	Not satisfactory
1028 F	Mathiola	Stock—Rose of Standish	Poor	Not satisfactory
1030 F	Tagetes	Crown of Gold	Fair	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Thomas J. Grey Co., Boston, Mass.				
589 F	Antirrhinum	Maximum Rustproof Mixed	Fair	Satisfactory; no rust; 3 colors
584 F	Callistephus	Sunshine Mixed	Poor	Not satisfactory
580 F	Chrysanthemum	Double Mixed	Fair	Not satisfactory; yellow only
582 F-D	Delphinium	Salmon Cockade	Fair	Incomplete; had not flowered Sept. 30
585 F	Petunia	Elk's Pride	Poor	Not satisfactory
586 F	Phlox	Gigantea Art Shades	None	
587 F	Portulaca	Double	Good	Satisfactory; 5 colors
588 F	Salpiglossis	Improved Large Flowering Mixed	Poor	Not satisfactory
581 F	Tagetes	Double African Buff Beauty	Fair	Satisfactory
583 F	Tagetes	Golden Orange	Good	Satisfactory
590 F-D	Verbena	Mixed	Poor	Not satisfactory
Joseph Harris & Co., Rochester, N. Y.				
795 F	Antirrhinum	Joseph Harris & Co., Lexington Snapdragon Harris' Colossal Mixed	Good	Satisfactory; 2 colors
796 F	Callistephus	American Branching Mixed	Fair	Satisfactory; 3 colors
797 F	Delphinium	Larkspur Mixed	None	
Charles C. Hart Seed Co., Wethersfield, Conn.				
Berkshire Hardware & Farm Supply Co., North Adams				
836 F	Helichrysum	Everlasting Mixed	Good	Incomplete
835 F	Iberis	Candytuft Dwarf Hybrid Mixed Colors	Fair	Satisfactory; 3 colors
Bryan Hardware Co., Westfield				
699 F	Callistephus	Giant Comet Mixed Colors	Good	Satisfactory; 2 colors
701 F	Impatiens	Balsam Choice Double Mixed	Fair	Not satisfactory; over 30% single
A. T. Chase Corporation, Dedham				
729 F-D	Kochia	Mexican Fire Bush	None	
Wakefield Supply Co., Wakefield				
544 F	Ageratum	Blue Perfection	Fair	Satisfactory
545 F	Calendula	Orange King	Poor	Not satisfactory
541 F	Ipomoea	Improved Heavenly Blue	Good	Satisfactory
543 F	Portulaca	Double Mixed Colors	Good	Satisfactory; 5 colors
542 F	Reseda	Giant Market Type Mignonette	Poor	Not satisfactory
Budd D. Hawkins, Reading, Vt.				
Home Supply Co., Orange				
879 F	Tagetes	New Crown of Gold	Fair	Not satisfactory; not odorless
880 F	Zinnia	New Giant Dahlia Flowered	Good	Satisfactory
Lunt & Kelley, Newburyport				
919 F	Callistephus	Blue	Poor	Not satisfactory
920 F	Cosmos	Dawn Mixed	Fair	Satisfactory
A. E. Stewart Estate, Athol				
883 F	Adonis	Mixed Colors	Poor	Not satisfactory
886 F	Antirrhinum	Snapdragon Fine Mixed	Fair	Satisfactory; 7 colors
885 F	Chrysanthemum	Mixed	Fair	Satisfactory; 2 colors
884 F	Nicotiana	Affinis Large Flowered White Sweet Scented	Good	Not satisfactory; 3 colors
Hygrade Seed Co., Fredonia, N. Y.				
Abraham Lincoln School, East Braintree				
311 F	Calendula	Exquisite Mixed Colors	Fair	Satisfactory; 4 colors
310 F	Tagetes	Sunset Giant Mixed	Poor	Not satisfactory
309 F	Tropaeolum	Golden Gleam	Good	Satisfactory
D. Landreth Seed Co., Bristol, Pa.				
Barstow's, Marshfield				
809 F	Tagetes	Yellow Supreme	Good	Satisfactory
Sylvester Co., Hanover				
527 F	Cosmos	Single Mixed Colors	Good	Satisfactory; 3 colors
525 F	Dianthus	Laciniatus Splendens	Good	Satisfactory
528 F	Helichrysum	Mixed	Good	Incomplete
531 F	Salvia	Bonfire	Poor	Not satisfactory
526 F	Tagetes	Guinea Gold	Good	Satisfactory
529 F	Zinnia	Lilliput Pompon Mixed	Good	Not satisfactory; 25% Pompons

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Mandeville and King Co., Rochester, N. Y.				
849 F	Callistephus	Berkshire Hardware Co., Pittsfield		
850 F	Gypsophila	Rose Pink	Good	Satisfactory
848 F	Mirabilis	Baby's Breath	Good	Satisfactory
		Four O'Clocks	Fair	Satisfactory; 3 colors
700 F	Scabiosa	Bryan Hardware Co., Westfield		
		Blue Cockade	Poor	Not satisfactory
782 F	Chrysanthemum	Felber Paint and Seed Store, Brockton		
783 F	Tithonia	Eldorado Scarlet	Fair	Satisfactory
784 F	Vinca	Orange	Fair	Satisfactory
785 F	Zinnia	All Colors	Good	Satisfactory; 3 colors
		Fantasy	Poor	Not satisfactory
		Guy E. Harvey, Hardware, Jamaica Plain		
725 F-D	Delphinium	Sky Blue	Fair	Satisfactory
726 F	Eschscholtzia	California Poppy Orange	Good	Satisfactory
727 F	Papaver	Keelan's Hardware Co., Dedham		
728 F	Sanvitalia	Sweet Briar	Good	Satisfactory
		Creeping Golden Yellow	Good	Satisfactory
662 F	Dimorphotheca	Kindler Hardware Co., Webster		
661 F	Zinnia	African Daisy	Fair	Satisfactory
		Lilliput All Colors	Good	Satisfactory; 6 colors
823 F	Anchusa	H. Newell & Co., Shelburne Falls		
821 F	Brachycome	Blue Bird	Fair	Satisfactory
822 F	Celosia	Swan River Daisy All Colors	Fair	Satisfactory; 3 colors
824 F	Nemesia	All Colors	Fair	Satisfactory; 4 colors
		Triumph All Colors	Good	Satisfactory; 4 colors
805 F	Tagetes	Plymouth Rock Hardware Corp., Plymouth		
		Golden West	Fair	Satisfactory
663 F	Reseda	Waite Hardware Co., Webster		
664 F	Verbena	Very Flowering	Good	Satisfactory
		Scarlet Defiance	Poor	Not satisfactory; only one plant
665 F	Zinnia	Mexican All Shades	Good	Satisfactory; 16 colors
Northrup, King & Co., Minneapolis, Minn.				
415 F	Tagetes	F. W. Woolworth & Co., Boston		
		Melody	Fair	Satisfactory
777 F	Callistephus	F. W. Woolworth & Co., Taunton		
775 F	Cheiranthus	Crego or Ostrich Plume White	Fair	Satisfactory
778 F	Chrysanthemum	Wallflower Single Mixed	Good	Satisfactory; 3 colors
772 F	Clarkia	Annual Mixed	Fair	Satisfactory; 2 colors
771 F	Dahlia	Double Mixed	Good	Satisfactory; 3 colors
773 F-D	Delphinium	Unwin Dwarf Hybrid Mixed	Fair	Satisfactory; 2 colors
774 F	Petunia	Larkspur Giant Imperial	Poor	Not satisfactory
		Rosy Morn	Good	Satisfactory; 25% pale lavender
776 F	Reseda	Mignonette-Sweet Scented Odorata	Good	Satisfactory
770 F	Tropaeolum	Golden Gleam-Some Double	Good	Satisfactory
The Poge Seed Co., Greene, N. Y.				
894 F	Mirabilis	Bengston Hardware Co., Gardner		
892 F	Papaver	Four O'Clocks Mixed Colors	Poor	Not satisfactory
893 F	Zinnia	Shirley Poppy American Legion	Good	Satisfactory
		Fantasy	Good	Not satisfactory; 50% not Fantasy type
747 F	Clarkia	Felix Hardware Co., Clinton		
748 F	Iberis	All Colors Mixed	Good	Satisfactory; 4 colors
750 F	Nicotiana	Umbellata Mixed Colors	None	
749 F	Salpiglossis	Sanderac Hybrid Mixed	Good	Satisfactory; 4 colors
		Gloxiniaeflora Mixed	Good	Satisfactory; 7 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Perry Seed Co., Boston, Mass.				
570 F	Alyssum	Carpet of Snow	Good	Satisfactory
571 F	Calendula	Perry's Orange King	Good	Not satisfactory; 3 types
572 F	Calendula	Sensation or Campfire	Good	Not satisfactory; 4 types
574 F	Centaurea	Cyanus Blue Boy	Good	Satisfactory
575 F	Cosmos	Yellow Flare	Fair	Satisfactory
576 F	Delphinium	Giant Imperial Brilliant Rose	Fair	Satisfactory
573 F	Iberis	Candytuft Giant White Perfection	Good	Satisfactory
578 F	Tagetes	Mammoth African All Double Orange	Fair	Satisfactory
577 F	Tagetes	Mammoth Mum Light Yellow	Fair	Satisfactory
579 F	Zinnia	Lilliput Salmon Rose	Good	Satisfactory
J. B. Rice, Jr., Inc., Shushan, N. Y.				
Community General Stores, West Bridgewater				
781 F	Dahlia	Unwin's Dwarf Hybrid	Poor	Not satisfactory
Plymouth Rock Hardware Co., Plymouth				
806 F	Celosia	Cockscomb Tall Flesh Mixed	Good	Not satisfactory; 6 colors
Toabes Duxbury Hardware Co., Duxbury				
807 F	Scabiosa	Giant Mixed	Poor	Not satisfactory
808 F	Zinnia	Super Giant White	Fair	Satisfactory; one plant pink flowers
Toabes Kingston Hardware Co., Kingston				
524 F	Ipomoea	Heavenly Blue	Good	Satisfactory
Yankee Maid Products, Inc., Boston				
896 F	Antirrhinum	Snadragon Pink	Poor	Not satisfactory
895 F-D	Phlox	Pink	Poor	Not satisfactory
897 F	Schizanthus	Large Flowered Mixed	Fair	Incomplete; did not flower
898 F	Tithonia	Speciosa	Poor	Not satisfactory
899 F	Vinca	Periwinkle Mixed	Fair	Satisfactory; 3 colors
900 F	Zinnia	Super Giant Polar Bear	Good	Satisfactory
Ross Bros Co., Worcester, Mass.				
423 F	Callistephus	Supreme Giant Los Angeles	Fair	Incomplete; had not flowered Sept. 30
422 F	Centaurea	Cyanus Double Blue Boy	Good	Satisfactory
426 F	Cosmos	Sensation Pinkie	Good	Satisfactory
427 F-D	Delphinium	Giant Imperial Miss California	Poor	Not satisfactory
419 F	Ipomoea	Grandiflora Alba	Fair	Incomplete; had not flowered Sept. 30
420 F	Ipomoea	Heavenly Blue	Good	Satisfactory
424 F	Petunia	Snow Queen	Poor	Not satisfactory; in- cluded striped types
418 F	Scabiosa	Tall Double Large Flowered Rosette	Poor	Not satisfactory
425 F	Tagetes	Dwarf Scotch	Good	Satisfactory
421 F	Tagetes	Extra Dwarf Double Spry	Good	Satisfactory
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Cambridge				
911 F	Clarkia	Double Mixed	Good	Satisfactory; 3 colors
912 F	Mirabilis	Four O'Clocks Mixed	Good	Satisfactory; 2 colors
Sears, Roebuck & Co., Framingham				
948 F	Callistephus	Giant Branching White	Poor	Not satisfactory
947 F	Dianthus	Chabaud Mixed	Poor	Not satisfactory
950 F	Lupinus	Texas Texas Blue Bonnet	Poor	Not satisfactory
949 F	Nemophila	Baby Blue Eyes	None	
Sterlina Seed Co., Minneapolis, Minn.				
W. T. Grant Co., Weymouth				
1000 F	Brachycome	Swan River Daisy	Good	Satisfactory; 4 colors
1001 F	Gomphrena	Globe Amaranth Mixed	None	
1002 F	Impatiens	Tall Double Camellia-flowered Mixed	Fair	Satisfactory; in- cluded some single
1003 F	Zinnia	Fantasy Mixed	Good	Satisfactory; 5 colors 10% not Fantasy

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Templin Bradley Co., Cleveland, Ohio (Children's Flower Mission)				
Washington School, Taunton				
767 F	Calendula	Scotch Marigold	Fair	Satisfactory; 5 colors
766 F	Cosmos	Early Giant Flowering	Fair	Satisfactory; 3 colors
768 F	Petunia	Hybrids Mixed	Poor	Not satisfactory
769 F	Sanvitalia	Creeping Zinnia	Good	Satisfactory
Voughan's Seed Store, New York, N. Y.				
Carlisle Hardware Co., Springfield				
676 F	Petunia	Single Dwarf Rose of Heaven	Poor	Not satisfactory
674 F	Tagetes	Dahlia Flowering	Good	Satisfactory
675 F	Tagetes	Gnome	Good	Satisfactory
Arnold Fisher Co., Boston				
712 F	Alyssum	Violet Queen	Fair	Satisfactory
720 F	Antirrhinum	University of California Mixed	Fair	Satisfactory; 5 colors
711 F	Calendula	Shaggy	Good	Satisfactory
715 F	Phlox	Grandiflora Splendens Mixed	Poor	Not satisfactory
713 F	Ipomoea	Scarlett O'Hara	Fair	Satisfactory
714 F	Petunia	Rose of Heaven	Good	Not satisfactory; 50% off type
717 F	Portulaca	Moss Rose Double Best Mixed	Good	Satisfactory
719 F	Scabiosa	Blue Moon Double Large Flowering	Poor	Not satisfactory
716 F	Verbena	Manmoth Mixed	Poor	Not satisfactory
718 F	Zinnia	Giant David Burpee	Good	Satisfactory; 5 colors
S. D. Woodruff & Sons, Orange, Conn.				
Rosen Hardware Co., East Dedham				
732 F	Cosmos	Sensation Mixed	Fair	Satisfactory; 2 colors
731 F	Eschscholtzia	California Poppy Finest Mixed Colors	Good	Not satisfactory; yellow and orange only
733 F	Phlox	Nana Compacta Dwarf	Fair	Satisfactory
734 F	Salvia	Scarlet Sage	Poor	Not satisfactory
735 F	Zinnia	Super Crown of Gold	Poor	Not satisfactory
E. I. Taske Co., Brockton				
507 F	Centaurea	Double Blue	Fair	Satisfactory
508 F	Iberis	Umbellata Mixed	Poor	Not satisfactory
506 F	Tagetes	Yellow Supreme	Fair	Satisfactory
Woburn Hardware & Plumbing Supply Co., Woburn				
801 F	Scabiosa	Tall Double Flowering All Colors	Poor	Not satisfactory
800 F	Tagetes	Carnation French Yellow Supreme	Good	Satisfactory

AGRICULTURAL EXPERIMENT STATION
MASSACHUSETTS

CONTROL SERIES

BULLETIN NO. 136

JUNE 1948

**Inspection of Commercial
Feedstuffs**

By Feed Control Service Staff

This is the fifty-fourth report on feeding stuffs inspection. The report contains detailed data on the quality of ground oats sold in Massachusetts during 1947-1948 and other information of interest to those concerned with the production, handling or use of feeds.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

John W. Kuzmeski, *Official Chemist*
Albert F. Spelman, *Senior Chemist*
C. Tyson Smith, *Assistant Chemist*
Robert T. Weiberbee, *Assistant Chemist*
Joseph Bart, *Junior Chemist*

Frederick A. McLaughlin, *Microscopist*
Joseph A. Martell, *Technical Assistant*
W. Noel Jameson, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Senior Clerk*

The fall and winter of 1947-1948 found the feed industry operating under more favorable conditions than those prevailing during the like period of 1946-1947. The increased availability of feed ingredients was reflected in better maintenance of guarantees on mixed feeds, particularly the maintenance of fiber guarantees.

Considerable difficulty, however, was encountered by some feed manufacturers in obtaining ground oats of specified quality. The Feed Control Service made a special effort during the past season to eliminate the questionable practices of a few manufacturers of this product. It is believed that the shipment into Massachusetts of ground oats adulterated with limestone or other mineral fillers has been stopped. Present evidence indicates that some shipments of ground oats contain considerable quantities of added screenings, oat hulls, oat mill feed or other materials of similar nature. This will necessitate the continued scrutiny of shipments of this product into this State. A detailed report on the ground oats situation in Massachusetts during the past season is given on pages 15-19.

In the report it is stated that analytical and shipping data on six shipments of ground oats were referred to the Food and Drug Administration of the Federal Security Agency. In the belief that the information may be of interest to the readers of this bulletin, the relationship between the Federal Food and Drug Administration and the Massachusetts Feed Control Service is explained here.

The Administrator of the Federal Security Agency under authority conferred by 21 U.S.C. (a), (Section 702 (a) of the Federal Food, Drug and Cosmetic Act of 1938) has commissioned the Official Chemist, and those agents under his direction whom he may designate, as officers of the Federal Security Agency, for the purposes of such Act, to conduct in the State of Massachusetts the following examinations and investigations:

- (1) To collect and to examine samples of food (commercial feeding stuffs) shipped or received in interstate commerce.
- (2) At reasonable times to have access to and to copy all records showing the movement of such articles in interstate commerce or the holding of such articles during or after such movement and the quantity, shipper, and consignee thereof, as authorized by 21 U.S.C. 373 (Section 703 of the Federal Food, Drug, and Cosmetic Act of 1938).

Under the provisions of the Massachusetts Feedingstuffs Act, it is not possible to prosecute any person or firm with a place of business outside the State. In cases of violations involving interstate shipments the Official Chemist or his designated agents are empowered to collect samples and to obtain the necessary shipping data. These data are then referred to the Federal Food and Drug Administration and are used by the Administration as the basis for action against the offending interstate shipper.

Registration of Brands

At the beginning of the past registration period, new simplified registration forms were sent to the larger feed manufacturers. The new form is a slightly modified version of that adopted earlier in Kansas.

Favorable comment on the new form has been received from several feed manufacturers, and, in the absence of adverse criticism, it is planned to continue the new registration procedure.

In return the Feed Control Service requests the cooperation of feed manufacturers in eliminating unnecessary correspondence. Each year the Control Service is burdened by some manufacturers with useless work involving correspondence concerning unregistered brands. This is directed toward several concerns which year after year, register their brands only after they have received two or three letters from the Control Service.

It is planned to eliminate this unessential work. On February 1 of each year a careful check of registrations will be made. One, and only one, reminding letter will be sent to each firm selling unregistered brands. If registration is not received within ten days a court complaint will be filed. In the future this complaint will not be withdrawn because the firm has registered its brands after the complaint has been filed.

Sex Control Feed

This year's registration applications were high-lighted by an application from a concern that decided to "add something new" to the field of poultry feeds.

In April, the Feed Control Service received an application for the registration of a "Sex Control Feed" or "Feminizing Mash." The tag submitted listed as ingredients, soybean meal, corn germ meal, dried skimmed milk, wheat meal, yellow corn meal, pulverized barley, alfalfa leaf meal, flour middlings and $\frac{1}{2}$ of 1% salt.

It was claimed that a larger proportion of the chicks hatched from eggs produced by birds that had been fed the "Sex Control Feed" according to directions would be of the desired sex than would normally be the case. The manufacturers claimed that nothing was present in the feed except the listed ingredients, and that the unusual property of the feed was due entirely to these ingredients and to the proportion in which they were present in the feed.

The Official Chemist, being somewhat skeptical of the manufacturer's claims, suggested that, since the feed would be involved in interstate commerce, the manufacturer clear the label through the Food and Drug Administration and, if approved by this Administration, further consideration would be given the registration of the label in this State.

Through correspondence with Mr. L. E. Bopst, Secretary-Treasurer of the Association of American Feed Control Officials, Inc., it was learned that registration of this feed was attempted in at least two other states with no greater success.

In conferences and discussions with representatives of the Federal Food and Drug Administration, the manufacturer of the "Sex Control Feed" was unable to furnish satisfactory scientific evidence to substantiate the claims made for his product. As a result, the manufacturer decided to suspend manufacture and sale of the feed in question until such time as experimental evidence is accumulated, if possible, to support adequately the claims made for his product.

Brands Substantially Complying with Guarantees

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Albers Milling Co.		Beacon Milling Co., Inc., Continued	
Calf Manna.....	1	Beacon Broiler Feed.....	1
Allied Mills, Inc.		Beacon Cali Grain.....	1
Economy 20% Dairy Ration.....	1	Beacon Cali Starter.....	2
Economy 16% Dairy Ration.....	2	Beacon Cayuga Horse Feed.....	1
Economy Laying Mash.....	1	Beacon Complete Starting Ration.....	1
Sugarine 20% Dairy Ration.....	1	Beacon "22" Egg Mash.....	1
Wayne All Mash Egg.....	2	Beacon Fitting Ration.....	1
Wayne All Mash Grower.....	1	Beacon Fleshing Pellets.....	2
Wayne Breeder Mash.....	1	Beacon Goat Ration.....	1
Wayne Chick Feed.....	1	Beacon Growing Mash.....	1
Wayne Chick & Broiler Ration.....	1	Beacon Hog Feed.....	1
Wayne 20% Dairy Ration.....	3	Beacon Poultry Fitting Ration.....	1
Wayne 16% Dairy Ration.....	2	Beacon Test Cow Ration.....	2
Wayne Egg Mash.....	2	Beacon Turkey & Game Bird Fitting Ration.....	1
Wayne Fitting Ration.....	1	Beacon Turkey Growing Mash.....	1
Wayne Growing Mash.....	2	Be-Co-Lass.....	1
Wayne Pork Maker.....	1		
Wayne Rabbit Pellets.....	1	Bisbee Linseed Co.	
Wayne Spring Pasture Poultry Pellets.....	1	Bisbee Brand 32% Protein Old Process Linseed Oil Meal.....	1
Wayne Turkey Growing Mash.....	2	Bisbee Brand 41% Protein Expeller Soybean Oil Meal.....	3
American Maize-Products Co.		Blatchley & Ballard, Inc.	
Cream of Corn Gluten Feed.....	2	Bee Brand 20% Dairy Ration.....	1
Arcady Farms Milling Co.		Bee Brand Laying Mash.....	1
Arcady Breeder Mash.....	1	Borden Co., Special Products Division	
Wonderfat Station Feed with Rolled Oats.....	1	Flaydry.....	1
Archer-Daniels-Midland Co.		Borden Grain Co.	
Archer Quality 41% Protein Soybean Oil Meal.....	1	Borden's Dairy Feed.....	2
Midland 30% Protein Linseed Feed.....	1	Borden's Laying Mash.....	1
Ashcraft-Wilkinson Co.		Borden's Starter and Growing Feed.....	2
Cow-Eta Brand 36% Prime Quality Cotton Seed Meal.....	1	George B. Brown Corporation	
E. W. Bailey & Co.		Brown's Dairy Feed.....	1
Pennant Brand Cali Ration.....	1	Brown's Egg Mash.....	1
Pennant Brand Chick Starter-Breeder.....	1	Brown's Growing Mash.....	1
Pennant Brand Complete Egg Ration.....	1	Brown's Pig Feed.....	1
Pennant Brand Complete Grower.....	1	Cargill, Inc.	
Pennant Brand 16% Dairy Ration.....	1	Linseed Oil Meal 32%.....	1
Pennant Brand Fitting Ration.....	1	Central Soya Co., Inc.	
Pennant Brand Growing Mash.....	1	Central Star Brand Soybean Oil Meal, 44%.....	2
Pennant Brand Horse Feed.....	1	Central 41% Protein Expeller Soybean Oil Meal.....	1
Pennant Brand Laying Mash.....	1	Community Service, Inc.	
Pennant Brand Pig Feed.....	2	Community Complete Pig Feed.....	1
Pennant Brand Turkey Grower.....	1	Community 18% Dairy Ration.....	1
Pennant Brand Yankee 16.....	1	Community 16% Dairy Ration.....	1
Pennant Brand Yankee Complete Egg Ration.....	1	Community Fitting Ration.....	1
Barber & Bennell, Inc.		Community Growing Mash.....	1
Ace Dairy Ration.....	1	Community Laying Mash.....	1
Fort Orange Dairy Ration.....	1	Community Starter & Growing Mash.....	1
Fort Orange 12% Fitting and Cali Grain Ration.....	1	Consolidated Chemical Industries, Inc.	
Fort Orange Golden Test Ration.....	1	Digesta-Bone.....	2
Fort Orange Pig & Hog Feed.....	1	Consolidated Rendering Co.	
Franklin Baker Division		*Corenco 45% Meat and Bone Scrap.....	2
General Foods Corp.		Corn Products Refining Co.	
Baker's Cooked Coconut Oilmeal.....	1	Buffalo Corn Gluten Feed.....	3
Beacon Milling Co., Inc.		Diamond Corn Gluten Meal.....	1
Auburn "20".....	1		
Beacon "16".....	1		
Beacon Battery Broiler Pellets.....	1		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Courcy & Sons Grain Co.		F. Diehl & Son, Inc.	
Courcy's Dairy Feed, 16%.....	2	Diehl's Dairy Feed.....	1
*Courcy's Growing Mash.....	1	Diehl's Dry Mash.....	1
Courcy's Horse Feed.....	1	Diehl's Fitting Ration.....	1
Courcy's Laying Mash.....	2	Diehl's Growing Feed.....	1
		Diehl's Starter Mash.....	1
Cover Grain & Feed Co.		Dietrich & Gambrill, Inc.	
C & P Own 20 Dairy Ration.....	1	Frederick 16% Dairy Feed.....	1
Chas. M. Cox Co.		Federick Laying Mash.....	1
Wirthmore Breeder Mash.....	1	Gambull's Chick Starter.....	1
Wirthmore Cali Starter Meal.....	1	Gambrill's Growing Mash.....	1
Wirthmore Complete Breeder Ration.....	1	Gambrill's Laying Mash.....	1
Wirthmore Complete Egg Ration.....	1	Pen Mar Horse & Stock Feed.....	1
Wirthmore Complete Growing Ration.....	2	Pig & Hog Meal.....	1
Wirthmore 20 Dairy Ration.....	1		
Wirthmore 14% Fitting Ration.....	1	J. L. Dunnell & Son	
Wirthmore Growing Mash.....	1	Excel 20% Dairy Ration.....	2
Wirthmore Horse Feed.....	2	Excel Fitting Ration.....	2
Wirthmore Laying Mash.....	2	Excel Laying Mash.....	2
Wirthmore Poultry Flush.....	1	Horse Feed.....	2
Wirthmore Rabbit Pellets.....	1	Starter and Grower—Horner's.....	2
Wirthmore 16 Record Ration.....	1		
Wirthmore Standard 16 Dairy Ration.....	1	East Longmeadow Grain Store	
Wirthmore Starter & Broiler Ration.....	1	Blue Ribbon All Mash Grower.....	1
Wirthmore Stock Feed.....	2	Blue Ribbon All Mash Layer.....	1
Wirthmore Turkey Breeder Ration.....	1	Blue Ribbon Chick Starter and Broiler Mash.....	1
Wirthmore Turkey Fattening.....	1	Blue Ribbon Dairy Feed.....	1
Wirthmore Turkey Growing Ration.....	1		
Wirthmore Turkey Starter.....	1	Eastern States Farmers' Exchange, Inc.	
Wirthmore Twin-Mix Cali Ration.....	1	Eastern States All-Mash Developer.....	1
		Eastern States Breeder Concentrate.....	1
Crawford Brothers, Inc.		Eastern States Calving Ration.....	1
Laying Mash.....	1	Eastern States Developer.....	1
Producer 20%.....	1	Eastern States Egg Mash.....	1
Star Complete Egg Mash.....	2	Eastern States Fitting Ration.....	1
Star Complete Growing Mash.....	2	Eastern States Fulpail.....	1
Star Laying Mash.....	1	Eastern States Highland 18.....	1
		Eastern States Horse Feed.....	1
Curley Grain & Fuel Co.		Eastern States Milkmore 16.....	1
Crystal Complete Laying Mash.....	3	Eastern States Minuteman Mash.....	1
Crystal Dairy Ration 20%.....	2	Eastern States Pig Starter and Breeder.....	1
Crystal Growing Mash.....	2	Eastern States Pork Builder.....	1
Crystal 20% Laying Mash.....	1	Eastern States Stock Feed.....	1
Crystal Laying Mash 19%.....	3	Eastern States 32% Supplement.....	1
*Crystal Starter and Broiler.....	1	Eastern States Turkey-Grower.....	1
Dailey Mills, Inc.		B. A. Eckhart Milling Co.	
Complete Egg Producer (All Mash).....	1	Ecko Pure Wheat Bran.....	1
Dairy Rich 20%.....	1		
Dairy Rich 16%.....	1	Elmore Milling Co., Inc.	
Double Diamond Complete Grower.....	1	Elmore Breeder Mash.....	1
Double Diamond Complete Layer.....	2	Elmore Chixsaver.....	2
Double Diamond Horse Feed.....	1	Elmore Complete Broiler Ration.....	1
Double Diamond Pork Producer.....	1	Elmore Complete Growing Ration.....	1
Double Diamond 20% Test Ration.....	1	Elmore Complete Layer and Breeder.....	1
Double Diamond 16% Test Ration.....	2	Elmore Complete Market Egg Mash.....	1
Range Grower.....	1	Elmore Egg Mash.....	1
		Elmore Fitting Ration.....	1
Dawe's Manufacturing Co.		Elmore Fleshing Pellets.....	1
Flavonne Ribo-D.....	2	Elmore Fullflo 20% Dairy.....	1
Vitamelnk Base.....	2	Elmore Fullflo 16% Dairy.....	1
		Elmore Growing Mash.....	1
Delaware Mills, Inc.		Elmore Milk Grains "Sixteen".....	2
Delaware Egg Mash.....	1	Elmore Stock Feed.....	1
Delaware Laying Mash.....	1	Elmore Test Ration.....	1
Delaware Rabbit Pellets.....	1	Elmore Turkey Finisher (Fattener).....	2
Delaware Sweet 16% Dairy Feed.....	1	Elmore Turkey Growing Mash.....	2
Frank Diauto			
Diauto's Growing Mash.....	1		
Diauto's Laying Mash.....	1		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
John W. Eshelman & Sons		Gateway Milling Association, Inc.	
Pennsy 16 Dairy Feed.....	1	*Gateway All Mash Grower.....	1
Pennsy Laying Mash.....	1	Gateway All Mash Layer.....	1
Red Rose Broiler Ration.....	1	Gateway Breeding Mash.....	2
Red Rose 16 Dairy Feed.....	1	Gateway Broiler Mash.....	3
Red Rose Growing Mash.....	1	Gateway Fitting Ration.....	1
Red Rose Laying Mash.....	1	Gateway Growing Mash.....	1
S-O-S.....	1	Gateway Laying Mash.....	2
		Gateway Star 16% Dairy Feed....	2
Essex County Co-operative Farming Association		General Mills, Inc.	
S-X All-Mash Breeder.....	1	Washburn's Gold Medal Hard	
S-X All-Mash Egg.....	1	Wheat Bran and Ground	
S-X All-Mash Growing.....	1	Wheat Screenings not exceed-	
S-X Breeder Mash.....	1	ing mill run.....	1
S-X 20% Dairy Ration.....	1	Washburn's Gold Medal Hard	
S-X Starting and Broiler.....	1	Wheat Standard Middlings	
		and Ground Wheat Screenings	
		not exceeding mill run.....	1
Farm Bureau Association		General Mills, Inc., Farm Service Division	
Breeder Mash.....	1	Farm Service 20% Dairy Feed....	1
Chick Starter Mash.....	1	Farm Service Horse Feed.....	1
Complete Breeder Mash.....	1	Farm Service Starter.....	1
Complete Market Egg Mash.....	2	NEC Laying Mash.....	2
Conditioner Mash.....	1	Vigor 16% Dairy Feed.....	1
Dairy 20%.....	1	Vigor Hog Feed.....	1
Dairy 18%.....	1		
Dairy 16%.....	1	General Mills, Inc., Larowe Division	
Developer.....	1	Dried Beet Pulp.....	2
Fitting Ration.....	1	Dried Molasses—Beet Pulp.....	1
Flushing Mash.....	1	Larro Broiler Feed.....	2
Horse Feed.....	1	Larro Calf Builder.....	1
Market Egg Mash.....	1	Larro Chick Builder.....	2
Turkey Grower & Finisher.....	1	Larro 20% Dairy Feed.....	2
		Larro 16% Dairy Feed.....	2
Farmers Feed Co.		Larro Egg Mash.....	2
Bull Brand Dried Brewers Grains .	2	Larro Poultry Breeder Mash.....	1
		Larro Sow and Pig Builder.....	1
Flory Milling Co., Inc.		Larro Turkey Breeder Mash.....	1
Flory 14% All Purpose Dairy Feed	1	Larro Turkey Builder.....	1
Flory 20% Dairy Feed.....	1		
Flory Fattener and Flesher Pellets	1	Glidden Co., Feed Mill Division	
Flory Hog Feed.....	1	Glidden All-Mash Grower.....	1
Flory N-er-G Mash.....	1	Glidden All-Mash Layer.....	1
Flory Pig and Sow Feed.....	1	Glidden 20% Dairy Feed.....	1
Flory Starter Mash.....	1	Glidden Growing Mash.....	1
Flory Superior 14% Fitting Ration	1		
Flory Turkey Grower.....	1	Gorton-Pew Fisheries Co., Ltd.	
Golden Flo (Sugared) Stock Feed .	1	Gorton's Redfish Meal.....	1
Fred A. Fountain		D. H. Grandin Milling Co.	
Fountain's Breeder Mash.....	2	Grandin's All-Mash Grower.....	1
*Fountain's Growing Mash.....	1	Grandin's All-Mash Layer.....	1
**Fountain's Laying Mash.....	1	Grandin's 14 Fitting Ration.....	1
Fountain's Starting and Broiler		Grandin's Horse Feed.....	1
Ration.....	2	Grandin's Laying Mash.....	2
		Grandin's 20 Milk Maker.....	2
J. B. Garland & Son, Inc.		Grandin's 16 Milk Maker.....	1
Garland Chick Starter.....	1	Grandin's Start-to-Finish Mash...	2
Garland Complete Starting and		Grandin's Starter & Broiler Mash.	1
Broiler Mash.....	1	Grandin's Stock Feed.....	2
Garland 20% Dairy Ration.....	1	Grandin's 16 Test Ration.....	1
Garland Fitting Ration.....	1		
Garland Horse Feed.....	1	Hales & Hunter Co.	
Garland Pig & Hog Ration.....	1	Kingalfia Horse Feed.....	1
Garland Stock Feed.....	1	Pioneer 18 Dairy.....	1
Garland Turkey Starting and		Pioneer Dry & Freshening.....	1
Growing Feed.....	1	Red Comb Broiler Mash.....	1
Royal 16% Dairy Ration.....	1	Red Comb Chick Starter.....	1

* See also table of "Brands Not Conforming to Guarantees".

** See also table of "Poultry Feeds with an Ash Content in Excess of 11 Percent."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
D. Harbeck & Sons		Chas. A. Krause Milling Co.	
Welcome Dairy Feed.....	1	Badger Yellow Hominy Feed.....	1
Welcome Growing Mash.....	1		
Welcome Starter and Broiler Mash.....	1	Kronick's Coal & Grain Co.	
Harper Feed Mills, Inc.		Kronick's Dairy.....	1
Exchange Laying Mash.....	1	Kronick's Egg Mash.....	1
Harco Complete Starting and Growing Ration.....	1	Kronick's Starter-Grower Mash.....	1
Harco 20% Dairy Ration.....	1		
Harco Pig and Hog Meal.....	1	L. B. Lovitt & Co.	
Harco Turkey Finisher Mash.....	1	Lovitt Brand Cottonseed Meal, 41%.....	1
D. B. Hodgkins Co., Inc.			
Hodgkins' Dairy Ration.....	1	Mackenzie & Winslow, Inc.	
Hodgkins' Growing Mash and Laying Mash.....	1	Money's Worth Complete Mash.....	1
Hood Mills Co.		Money's Worth Dairy Feed 20%.....	2
*Pulverized Hood.....	3	Money's Worth Growing Mash.....	2
Hubbard Milling Co.		Money's Worth Laying Mash.....	2
Mother Hubbard Bran.....	1	Money's Worth Turkey Fattener.....	1
Hubinger Co.		Maine Fish Meal Co.	
KeOkuk Corn Gluten Feed.....	1	Maine Concentrate.....	1
Humphreys-Godwin Co.		Mansfield Milling Co.	
Humphreys Brand Old Process Soy Bean Oil Meal, 41%.....	1	Mansfield "20".....	1
Independent Tallow Co.		Mansfield Chick Growing Mash.....	1
Eggaday Brand 50% Protein Meat and Bone Scrap.....	1	Mansfield Chick Starter.....	1
International Milling Co.		Mansfield Dry Poultry Mash.....	1
Blackhawk Wheat Bran with Ground Wheat Screenings not exceeding 8%.....	1	Maritime Milling Co., Inc.	
Blackhawk Wheat Bran and Wheat Standard Middlings containing Screenings not exceeding mill run.....	1	B-B Egg Mash.....	1
Blackhawk Wheat Standard Middlings with Ground Wheat Screenings not exceeding mill run.....	3	B-B Farmers Mixing Feed 32% Protein.....	1
Jaquith & Co.		B-B Horse Feed.....	1
41% Brazil Cottonseed Meal.....	1	Hi-Test Hog Feed.....	1
20% Dairy Ration.....	3	Sweetened Bull Brand "20" Dairy Ration.....	1
**Growing Mash.....	2		
**Laying Mash.....	2	Methuen Grain Co.	
Maine Mash.....	1	Umpire All-Mash Layer.....	1
Starting Mash.....	2	Umpire 20% Starter-Broiler Mash.....	1
Kasco Mills, Inc.		Miner-Hillard Milling Co.	
Kasco Beetsall Milk Grains 20%.....	1	Choice Steam Cooked Hominy Feed.....	1
Pig Hog Feed.....	1	Geo. Q. Moon & Co., Inc.	
Kellogg Co.		Moon's Complete Laying Mash.....	1
Kellogg's Hominy Feed.....	2	Moon's Complete Starter and Broiler Mash.....	1
Spencer Kellogg & Sons, Inc.		Moon's Fitting Ration.....	2
Spencer Kellogg's 34% Protein Old Process Linseed Oil Meal.....	1	Moon's Hog Feed.....	1
King Midas Flour Mills		Moon's 90 Horse Feed.....	2
Pure Wheat Bran.....	1	Moon's Laying Mash.....	1
H. C. Knoke & Co.		N. E. Complete Laying Mash.....	1
Barley Feed.....	1	Special A Dairy 20% Ration.....	1
		Special A Dairy 16% Ration.....	1
		Jas. F. Morse & Co.	
		Morse's 45% Meat & Bone Scraps.....	2
		National Distillers Products Corp.	
		Nadrisol Brand Distillers Dried Solubles.....	1
		Produlac Brand Dried Corn Distillers Grains with Solubles.....	1
		Near's Food Co., Inc.	
		Mineraltone.....	1
		Ogden Grain Co.	
		"Biddy" Mash.....	1
		Cloverbloom Dairy Feed, 20%.....	1
		Cloverbloom Dairy Feed, 16%.....	1
		Ogden Complete Starter-Grower Layer.....	1
		Ogden Fitting Ration.....	1

* See also table of "Brands Not Conforming to Guarantees".

** See also table of "Poultry Feeds with an Ash Content in Excess of 11 Percent."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Oswego Soy Products Corp.		Ralston Purina Co., Continued	
Expeller Soy Bean Oil Meal Toasted, 41%.....	2	Purina Chick Growena.....	1
Pabst Brewing Co.		Purina Chicken Fatena.....	1
Pabst Hominy Feed.....	2	Purina Cow Chow.....	1
Palm Grain Co.		Purina Dry and Freshening Chow.....	2
Palm's Complete Starter-Grower- Layer.....	1	Purina Flock Chow.....	1
Park & Pollard Co., Inc.		Purina Layena (Complete Ration).....	1
Doublex 20% Dairy Ration.....	1	Purina Omolene.....	1
Go-Tu-It Pig & Hog Ration.....	1	Purina Turkey Growena.....	1
Hi-Valu Scratch Pellets.....	1	John Reardon & Sons Division of Wilson & Co., Inc.	
Lay or Bust All-Mash Layer.....	2	47% Register Brand Meat and Bone Scraps.....	1
Lay or Bust Broiler Mash.....	1	45% Register Brand Meat and Bone Scraps.....	2
Lay or Bust Chick Starter.....	1	D. F. Riley	
Lay or Bust Egg Mash.....	1	Riley's 16% Dairy Ration.....	1
Lay or Bust Laying Pellets.....	1	Riley's 18% Laying Mash.....	1
Lay or Bust Turkey Grower.....	1	Robin Hood Flour Mills, Ltd.	
Milk-Maid Cali Starter Pellets.....	1	Superior Wheat Shorts.....	1
Milk-Maid 20% Dairy Ration.....	1	Russell-Miller Milling Co.	
Milk-Maid Test Cow Ration.....	1	Hard Wheat Occident Bran.....	2
Park & Pollard Stock Feed.....	1	Hard Wheat Occident Standard Middlings.....	1
Yankee Horse Feed.....	1	Ryther & Warren Co.	
George H. Parker Grain Co.		Blue Tag Dairy Ration.....	2
Parker's Egg Mash.....	1	Minot Chick Mash.....	1
Parker's Growing Mash.....	1	Minot Egg Mash.....	2
Parker's Starter and Broiler Mash.....	1	Minot Growing Mash.....	2
Pasco Packing Co.		Sea Board Supply Co.	
Sugar Sweet Citrus Pulp.....	1	Crab Meal.....	1
Patent Cereals Co.		Joseph E. Seagram & Sons, Inc.	
Hominy Feed.....	3	Seagram's Corn Distillers Dried Grains.....	1
Pillsbury Mills, Inc.		Shellabarger Mill & Elevator Co.	
Pillsbury's Hard Wheat Bran with Ground Wheat Screenings not exceeding mill run.....	2	Wheat Bran and Ground Wheat Screenings.....	2
Pillsbury's Hard Wheat Standard B Middlings with Ground Wheat Screenings not exceed- ing mill run.....	1	Allen V. Smith, Inc.	
Publicker Industries, Inc.		Smith's Barley Feed.....	3
Dried Corn Distillers Solubles.....	1	A. E. Staley Manufacturing Co.	
Quaker Oats Co.		Staley's Corn Gluten Feed.....	1
Ful-O-Pep Calf Ration.....	1	Staley's Corn Gluten Meal.....	1
Ful-O-Pep Chick Starter.....	1	Staley's 41% Protein Soybean Oil Meal.....	4
Ful-O-Pep 16% Dairy Ration.....	2	Standard Milling Co.	
Ful-O-Pep Egg-Breeder Mash.....	1	Hecker's Wheat Standard Middlings with Ground Wheat Screenings not exceeding mill run.....	1
Ful-O-Pep Growing Mash.....	1	Wheat Standard Middlings with Ground Wheat Screenings not exceeding mill run.....	6
Ful-O-Pep Horse Feed.....	1	D. A. Stickell & Sons, Inc.	
Ful-O-Pep Laying Mash.....	1	Su-Pur Horse Feed.....	1
Ful-O-Pep Pig-N-Sow Feed.....	1	Swift & Co.	
Ful-O-Pep Super Greens.....	1	Swift's 5% Protein Special Steamed Bone Meal.....	1
Peterborough Oat Feed.....	1	Swift & Company Soybean Mill	
Quaker Sugared Schumacher Feed.....	1	Swift's 44% Protein Soybean Oil Meal.....	1
Sugared Vim Feed.....	1	Swift's 41% Protein Soybean Oil Meal.....	1
Ralston Purina Co.			
Chowmix Growing Mash.....	1		
Chowmix Laying Mash (18%).....	1		
Northeastern 18% Creamery Ration.....	1		
Purina B & M Cow Chow.....	1		
Purina Breeder Layena (Complete Ration).....	1		
Purina Broiler Chow.....	1		

** See also table of "Poultry Feeds with an Ash Content in Excess of 11 Percent."

Brands Substantially Complying with Guarantees—Concluded

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Taunton Grain Co.		Wayne County Grangers Feed Corp.	
Balanced Ration.....	2	Milkproducer 16% Dairy Feed....	3
Chick Starter.....	1	Superior 20% Dairy Feed.....	1
*Fitting Ration.....	1	Superior Horse Feed.....	1
*Growing Mash.....	1	Superior Laying Mash.....	2
*Laying Mash.....	1		
Winnecannet Turkey Growing....	1	H. K. Webster Co.	
Union Starch & Refining Co.		Blue Seal All-Mash Breeder's	
Union Corn Gluten Feed.....	1	Ration.....	1
United Cooperative Farmers, Inc.		Blue Seal All-Mash Egg Ration....	2
United Farmers All Mash Grower		Blue Seal All-Mash Growing Ration	1
& Layer.....	1	Blue Seal Broiler Mash.....	1
United Farmers Breeder Mash....	2	Blue Seal Calf Grower.....	1
United Farmers Fitting Ration....	1	Blue Seal Calf Starter.....	1
United Farmers Grower.....	3	Blue Seal Chick Starter.....	2
United Farmers Layer.....	3	Blue Seal "20" Dairy Ration....	2
United Farmers Milkmaker.....	1	Blue Seal "16" Dairy Ration....	2
United Farmers Starter.....	2	Blue Seal Egg Mash.....	3
Unity Feeds, Inc.		Blue Seal Fattening Pellets.....	1
Unity 16% Dairy Ration.....	1	Blue Seal Fitting Ration.....	1
Unity Laying Mash.....	1	Blue Seal Growing Mash.....	1
Valier & Spies Milling Co.		Blue Seal Horse Feed.....	1
Valier's Wheat Bran.....	2	Blue Seal Pig Feed.....	1
Valley Dehydrating Co.		Blue Seal Rabbit Pellets.....	2
Sol-Trade.....	4	Blue Seal Richford 20 Dairy Ration	2
Arthur Ventura Grain Co.		Blue Seal Richford Economizer	
*Ventura Grower.....	1	Dairy Ration.....	1
Ventura Laying Mash.....	2	Blue Seal Stock Feed.....	1
Vita-Vim Millers		Blue Seal Succulent Feed.....	1
Speedy Egg Mash.....	1	Blue Seal Test Ration.....	1
Speedy Grower.....	1	Blue Seal Tonic Mash.....	1
Vita-Vim All Mash Breeder Mash...	1	Blue Seal Turkey Growing.....	1
Vita-Vim All Mash Growing Mash...	1		
Vita-Vim All Mash Laying Mash...	2	Western Condensing Co.	
Vita-Vim Broiler Mash.....	1	Peebles Dried Whey-Product with Whey	
Vita-Vim Cream-O-Fat 12% Fit-O-		Fermentation Solubles (Ribolac)	1
Fresh.....	1	Peebles Lacto-G Dried Whey.....	1
Vita-Vim Horse & Mule Feed.....	1	Whitmoyer Laboratories, Inc.	
Vita-Vim Quick 3 Action Pellets...	1	Clo-Meal.....	2
Vita-Vim Turkey Growing Mash...	1	Gro-Tein.....	1
Vita-Vim Turkey Starting Mash...	1	Stanley Wood Grain Co.	
C. P. Washburn Co.		Bliss Dairy Ration.....	3
Made-Right Breeder.....	1	Preferred Complete Growing Ration	2
Made-Right Complete Broiler.....	1	Preferred Complete Laying Mash...	2
Made-Right Complete Layer.....	1	*Preferred Growing Feed.....	1
Made-Right 16% Dairy.....	1	Preferred Laying Mash.....	3
Made-Right Fitting Ration.....	1	Preferred Starting Feed.....	2
Made-Right Laying Mash.....	2	Wood's Dairy Ration.....	2
Made-Right Starting Feed.....	2	Wood's Stock Feed.....	3

* See also table of "Brands Not Conforming to Guarantees."

Brands Not Conforming to Guarantees

This table includes brands that are one percent or more under guarantee in protein or fat or are one and one-half percent or more over guarantee in fiber.

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Barber & Bennett, Inc. Fort Orange Dry and Freshening Ration	15.4	12.0	3.0	3.0	13.8	11.0	9.2
Consolidated Rendering Co. *Corenco 45% Meat & Bone Scrap	43.9	45.0	7.8	6.0	-	-	40.8
Courcy & Sons Grain Co. *Courcy's Growing Mash	17.6	17.0	4.2	4.0	11.1	8.0	12.6
Crawford Brothers, Inc. Crawford Crate Fattener Mash Crawford Stock Feed 11%	15.3 12.4	14.0 11.0	6.3 3.8	4.0 3.0	9.0 15.3	7.0 12.0	6.1 7.5
Curley Grain & Fuel Co. Crystal Complete Growing Mash *Crystal Starter and Broiler	19.0 19.6 21.1 20.0	15.0 15.0 18.0 18.0	4.6 4.4 5.2 4.4	4.0 4.0 4.0 4.0	7.5 8.1 8.2 8.3	6.0 6.0 6.0 6.0	8.5 9.6 10.6 9.7
Frank Diauto Diauto's 18% Broiler Mash	20.8	18.0	5.7	3.5	7.6	5.5	7.6
Dietrich & Gambrell, Inc. Pen Mar 20% Dairy	18.4	20.0	4.6	3.5	9.0	10.0	6.9
Elmore Milling Co., Inc. Elmore M.A.C. Laying Mash	20.1	18.0	4.0	3.5	9.5	8.0	9.6
Flory Milling Co., Inc. Flory 18% Dairy Feed Flory Pure 55% Meat Scrap	17.0 52.5	18.0 55.0	4.0 3.2	3.5 1.0	8.1 -	9.0 -	7.9 30.2
Fred A. Fountain *Fountain's Growing Mash	18.7	18.0	5.0	4.0	9.3	7.0	10.2
J. B. Garland & Son, Inc. Garland Breeder Mash Garland Growing Mash Garland Laying Mash Royal Complete Laying Ration	21.5 16.1 19.0 15.8	20.0 14.0 18.0 15.0	3.7 4.2 4.2 4.4	3.0 3.0 3.5 3.0	9.0 8.7 8.8 8.5	7.0 7.0 7.0 7.0	10.1 8.1 9.5 9.6
Gateway Milling Assn., Inc. *Gateway All Mash Grower	17.7 15.7	15.0 15.0	4.3 4.2	3.5 3.5	8.9 8.7	7.0 7.0	6.6 6.6
General Mills, Inc., Farm Service Div. Farm Service Growing Mash Farm Service Laying Mash	20.4 20.7	19.0 20.0	4.9 4.7	3.5 3.5	9.9 10.2	8.0 8.5	7.9 8.0
D. Harbeck & Sons Welcome Egg Mash	18.5	20.0	4.6	4.0	7.1	7.0	8.4
Hood Mills Co. *Pulverized Hood	11.9	12.0	2.5	2.0	15.8	13.0	4.2
Geo. Q. Moon & Co., Inc. Moon's Complete Growing Mash Moon's Growing Mash	17.0 19.8 19.8	16.0 17.0 17.0	5.0 4.3 4.7	3.0 3.0 3.0	12.0 9.7 8.2	9.0 7.0 7.0	9.8 10.1 7.5
Ogden Grain Co. Ogden Range Pellets	18.3	16.0	4.7	3.0	11.0	9.0	8.4
Ralston Purina Co. Purina Bulky Las.	11.6	10.0	2.0	2.0	17.6	16.0	11.3
Stratton & Co. Stratton's Stock Feed	6.7	7.5	3.5	2.83	16.5	14.43	3.5

* See also table of "Brands Substantially Complying with Guarantees."

Brands Not Conforming to Guarantees—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Taunton Grain Co.							
*Fitting Ration.....	12.9	14.0	4.7	4.0	8.5	14.0	8.4
*Growing Mash.....	19.4	18.0	4.4	4.0	9.5	7.0	8.7
*Laying Mash.....	20.8	18.0	4.7	4.0	9.9	7.0	10.8
Unity Feeds, Inc.							
Unity Growing Mash.....	17.9	16.0	4.9	3.0	8.9	7.0	8.7
Arthur Ventura Grain Co.							
Every-Day Dairy.....	19.5	22.0	3.4	4.5	9.7	7.0	7.9
Every-Day 20% Dairy.....	20.1	22.0	3.3	4.5	10.8	7.0	8.1
*Ventura Grower.....	20.8	20.0	4.5	4.0	10.3	7.0	7.3
	16.9	16.0	4.2	4.0	7.5	6.0	8.5
O. B. Vunck & Co.							
Cortland Growing Mash.....	18.7	16.0	4.4	4.0	8.3	6.5	8.1
C. P. Washburn Co.							
Made-Right Pig Feed.....	16.3	16.0	4.5	3.0	9.8	7.0	9.0
Made-Right Stock Feed.....	9.8	8.0	3.3	3.5	11.0	7.0	3.2
Wayne County Grangers Feed Corp.							
Superior Hog Ration.....	17.6	16.0	4.7	3.5	8.5	7.0	5.3
	17.4	16.0	4.0	3.5	10.1	7.0	5.6
Stanley Wood Grain Co.							
*Preferred Growing Feed.....	19.5	17.5	5.0	3.0	8.6	7.0	9.8

* See also table of "Brands Substantially Complying with Guarantees."

Alfalfa Meals

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligrams per Pound	Riboflavin Milligrams per Pound
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed			
Thomas H. Avery John Greenleaf Whittier Brand Alfalfa Meal.....	19.8 (18.1)	17.0 17.0	3.5 3.1	1.5 1.5	25.4 29.8 ^a	25.0 25.0	11.3 6.7	67.0 45.4	6.1 5.4
Barton Mills, Inc. 17% Dehydrated Alfalfa Meal.....	18.6	17.0	2.9	1.5	23.9	28.0	10.6	72.2	7.0
A. B. Caple Co. Capex Dehydrated Alfalfa Meal.....	15.8	15.0	2.9	1.5	26.6	31.0	8.5	39.0	6.8
Caro-Green, Inc. Caro-Green Dehydrated Alfalfa Meal.....	17.4 ^b (17.1)	20.0 17.0	2.5 2.9	1.5 1.5	27.3 ^a 27.9	25.0 28.0	10.4 10.7	19.5 55.4	5.2 5.4
Caro-Green Dehydrated Alfalfa Meal.....	18.5 (17.2)	17.0 17.0	2.9 3.1	1.5 1.5	28.0 23.2	28.0 28.0	10.2 11.0	49.0 54.0	5.9 6.7
Caro-Green Sun-Dried Alfalfa Meal.....	18.1 (17.7)	17.0 17.0	2.8 2.9	1.5 1.5	27.9 26.3	28.0 28.0	9.0 9.2	37.0 52.0	5.8 5.1
Gothenburg Alfalfa Products Co. Gothen Green 17% Dehydrated Alfalfa Meal.....	17.6	17.0	1.7	1.5	27.0	33.0	10.4	33.6 6.4	4.9 4.7
Gorton-Pew Fisheries Co., Ltd. Gorton's All-Fish Blend Junior.....	21.3	17.0	3.0	1.5	23.9	28.0	14.1	47.0	7.1
Gorton's All-Fish Blend Senior.....	42.1 (41.9)	40.0 40.0	8.1 7.9	6.0 6.0	7.2 6.5	7.0 7.0	18.2 19.4	7.0 9.0	20.1 13.4
Green Seal Dehydrated Alfalfa Meal.....	41.2	40.0	9.2	7.5	6.9	7.0	18.4	7.3 6.0	11.6 12.9
Keystone Dehydrators Keystone Super-Green Dehydrated Alfalfa Meal.....	21.7	20.0	3.0	1.5	22.7	22.0	11.7	54.5	6.8
Koelling-Thompson Dehydrating Co. Dehydrated Alfalfa Meal.....	(17.5) 18.7	17.0 17.0	2.2 2.6	2.0 2.0	31.5 ^a 29.5	30.0 30.0	8.1 9.1	18.6 23.0	3.9 5.0
	17.8 (18.0)	17.0 17.0	2.5 2.6	2.0 2.0	31.0 25.6	30.0 30.0	9.1 8.6	23.0 45.0	4.1 6.3
	20.0	20.0	3.3	2.0	26.4 ^a	20.0	10.9	44.5	8.6

Mead Alfalfa Milling Co., Inc. Dehydrated Alfalfa Meal 17% ^c	18.0	17.0	3.5	1.75	25.0	27.0	9.3	63.0	6.3
Meadow Brook Farms Superior Brand Dehydrated Alfalfa Meal.....	15.2	15.0	2.6	2.0	26.2	30.0	10.8	11.8	4.9
August Modenhauer Mill Dehydrated Alfalfa Meal.....	17.4	15.0	2.8	1.5	24.4	30.0	10.1	43.0	5.3
National Alfalfa Dehydrating & Milling Co. 17% Jack Rabbit Dehydrated Alfalfa Meal.....	18.3	17.0	2.5	1.5	25.1	27.0	8.6	18.6	5.6
Neumond Co. Neumond's 17% Dehydrated Alfalfa Meal.....	18.1 19.4 (17.4	17.0 17.0 17.0	3.2 3.3 2.8	1.5 1.5 1.5	24.6 26.5 27.3	27.0 27.0 27.0	10.6 8.7 8.6	87.6 30.0 27.8	6.3 7.9 5.4
Pacific Milling Co. Poultry Alfalfa Meal.....	16.6	17.0	2.1	2.0	26.7	30.0	5.7	6.0	4.3
Platte View Alfalfa Co. Dehydrated Alfalfa Meal 17% ^c	17.5	17.0	2.1	1.75	28.7 ^a	27.0	8.9	17.0	5.3
Schoeneck Farms, Inc. Super-Green Dehydrated Alfalfa Meal	15.6 ^b 17.5 (15.1 ^b	17.0 17.0 17.0	3.0 2.6 3.1	2.0 2.0 2.0	27.2 30.7 ^a 23.2	27.0 27.0 27.0	8.5 9.2 10.2	53.0 26.0 11.0	5.1 — 4.6
Frank P. Seelos & Son Alfalfa Meal.....	14.2	—	2.6	—	31.1	—	7.4	22.0	5.0
W. J. Small Co. Small's 17% Dehydrated Alfalfa Meal.....	18.8 18.9 (17.8	17.0 17.0 17.0	3.3 2.9 3.2	1.75 1.75 1.75	26.2 26.2 26.6	27.0 27.0 27.0	10.5 10.5 9.7	39.0 27.7 47.2	5.3 5.5 4.9
Sunny Slope Farms, Inc. Dehydrated Alfalfa Meal.....	13.7 (17.1	17.0 17.0	2.2 2.9	2.0 2.0	27.4 27.4	30.0 30.0	12.2 10.3	19.5 17.7	4.4 5.1
West Side Hay & Milling Co. Alfalfa Meal.....	16.6	15.0	1.9	1.5	29.2	28.0	11.9	10.0	3.9
Weston Mills, Inc. Westco Dehydrated Alfalfa Meal.....	19.6	17.0	2.6	1.0	25.4	28.0	8.9	41.0	—

^a Excessive fiber.^b Protein deficient.

Dry Dog Foods

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Aibers Milling Co. Friskies Dog Food Cubes...	26.6	24.0	5.8	4.5	3.4	4.0	11.1
Armstrong Food Co. Division, Borden Co. Armstrong Dog Meal..... Armstrong Dog Pellets.....	27.4 25.6	25.0 25.0	5.5 5.3	4.0 4.0	4.4 4.2	4.0 4.0	11.5 12.0
Austin Dog Food Division, Sunshine Biscuits, Inc. Austin's Dog Food (Kibbled).....	24.1	22.0	3.3	2.5	3.9	4.5	7.1
Chas. M. Cox Co. Wirthmore Dog Food (Pellets).....	27.2	25.0	5.8	4.0	4.2	6.0	10.6
Daily Packing Co. Daily Dog Food Kibbled Biscuit.....	22.7	22.0	2.2	3.0	2.3	3.5	2.7
Eastern States Farmers' Exchange, Inc. Eastern States Dog Feed..... Eastern States Dog Feed.....	24.8 25.8	24.0 24.0	5.1 4.7	3.5 3.5	4.7 3.5	5.0 5.0	11.7 10.7
Gaines Division, General Foods Corp. Gaines Meal (for All Dogs).....	27.4	25.0	6.4	5.0	3.9	5.0	9.9
John W. Eshelman & Sons Red Rose Dog & Puppy Food.....	29.5	23.0	5.1	4.75	4.8	3.5	12.2
General Mills, Inc., Larrow Division Larro Dog Food.....	27.3	24.5	5.8	4.5	5.0	6.0	9.8
Hales & Hunter Co. Lucky Dog Meal.....	27.6	22.0	6.4	4.0	4.6	6.0	6.3
Kellogg Co. Gro-Pup Dog Food.....	25.7	22.5	5.0	3.5	4.9	4.0	6.6
Kennel Food Supply Co. Cero-Meato Brand Kibbled Dog Food..... Fairfield Dog Meal.....	24.0 25.7	21.0 20.5	3.0 4.0	2.0 2.63	2.3 3.4	3.0 3.62	12.8 13.1
Maritime Milling Co., Inc. Hunt Club Dog Meal.....	24.8	23.0	5.7	3.5	4.0	4.0	10.4
Geo. Q. Moon & Co., Inc. Moon Dog Food.....	25.3	24.0	5.8	4.0	3.9	4.0	10.0
National Biscuit Co. Milk-Bone Dog Biscuit..... Pal Dog Biscuit.....	23.5 20.6	21.0 18.5	4.4 2.0	1.5 1.0	2.7 2.4	2.5 2.5	6.2 4.8
Old Trusty Dog Food Co. Old Trusty All Terrier Food.....	27.0	27.0	2.8	2.5	2.3	3.0	11.8

Ground Oats

The analysis of a few samples of ground oats during the 1946-1947 inspection season indicated the need of a careful scrutiny of the quality of ground oats shipped into and sold in Massachusetts. Accordingly it was planned to make an extensive survey of this product during the 1947-1948 inspection season, and 68 samples of ground oats, representing products of 27 manufacturers, were collected and analyzed.

In order to provide a basis for comparison, 20 samples of graded whole oats were ground and analyzed. With the exception of No. 4 Grade and Sample Grade, care was taken to have at least four different test weights represented in each of the grades. Thirteen of these samples were Federal graded samples obtained from Mr. M. B. Gleason, Officer in Charge, Boston Grain Branch, Production and Marketing Administration, U.S.D.A. The other seven samples were graded at this laboratory.

A study of the data given in the ground oats table in comparison with those for whole oats reveals significant variations in composition.

It is noted that the ash content of the whole oats does not exceed 3.7 percent in any case. The ash content of the ground oats samples varies from 3.0 to 11.6 percent. In general it may be stated that an ash content of over 4 percent in ground oats should be viewed with suspicion. The abnormal ash content may be due to added screenings containing a large percentage of acid insoluble material. It may be due, also, to the addition of high calcium limestone or dolomitic limestone or some other mineral diluent.

During the past two years the products of three concerns were found to be contaminated or adulterated with limestone on a large scale. When asked for an explanation for the presence of the limestone, each company offered a different one. These explanations may be of interest to the reader.

The representative of one company stated that it was experiencing labor trouble at its plant, particularly with the night shift. It was presumed by this representative that certain members of the night shift were adding limestone surreptitiously to the ground oats as a means of "getting even" with the management. This must have been done with a great deal of confidence on the workers' part in the alertness of the State Control Officials. If undetected by Control Officials, such practice necessarily means a nice profit to the company.

A representative from the second company stated that they were receiving calcium carbonate in bulk and that the same conveyors were used for all their bulk ingredients. He suggested the possibility of a residue of calcium carbonate on the conveyors when they were used for moving oat shipments.

The third company's representative stated it had been suggested to his firm that "calcium" would retard heating in bins. Therefore, they used a high grade of feeding "calcium" which not only retarded heating but successfully stopped heating already begun. Apparently this firm considers dolomitic limestone as high grade feeding "calcium."

Three Federal samples were taken from shipments made by Doughboy Industries, Inc., Richmond, Wisconsin, and three such samples were taken from shipments made by Van Dam & Sons, Casco, Wisconsin. The analytical data and shipping records on the six samples were submitted to the Federal Food and Drug Administration, Federal Security Agency, for action by the Administration.

Getting back to the data presented in the ground oats table: the fat content was found to vary from 3.5 to 6.1 percent. The lowest fat content found in the whole oats was 4.7 percent. As a rule, a fat content below 4.5 percent in ground oats indicates that the product is not straight ground oats.

Microscopic examination of some of the samples with sub-normal fat percentages has indicated that products sold as ground oats are sometimes more or less synthetic mixtures of ground wheat, barley, and oats plus added oat hulls, oat mill feed, or similar high-fiber materials. This is most apt to be true when a low fat content is associated with high fiber and low protein contents.

It is regrettable that the practices of a few manufacturers of ground oats during the past two seasons have done much to undermine the confidence of feed manufacturers in the quality of all ground or pulverized oat products. Some feed manufacturers have become convinced that the only way they can be sure of obtaining ground oats of the desired quality is by grinding the oats at their own plants. During the past two seasons Massachusetts feed manufacturers have probably experienced more difficulty with the quality of ground oats than with that of any other feed ingredient.

In the future this Control Service plans to watch carefully the shipments of ground oats into Massachusetts, and to have grossly adulterated shipments seized by the Federal authorities. It is not intended to have this State remain a market for Wisconsin or any other limestone at eighty or ninety dollars a ton. For this purpose it is requested that Massachusetts feed manufacturers notify the Feed Control Service whenever shipments of ground oats of questionable quality are received.

Whole Oats

Grade	Sound Cultivated Oats Percent	Test Weight per Bushel Pounds	Protein Percent	Fat Percent	Fiber Percent	Ash Percent	Acid Insoluble Ash Percent	Calcium Percent	Magnesium Percent
No. 1.....	97.7	32.0	13.0	5.9	14.1	3.0	—	0.08	0.13
No. 1.....	98.5	32.5	12.9	5.1	11.5	3.4	—	.06	.15
No. 1.....	97.1	38.5	12.9	5.3	12.0	2.9	1.2	—	—
No. 1.....	98.5	39.1	13.6	5.9	11.1	2.8	—	.07	.12
No. 2.....	95.5	34.0	12.8	5.9	12.9	3.3	—	.08	.14
No. 2.....	94.8	34.5	12.5	5.6	13.0	3.4	—	.09	.13
No. 2.....	94.3	35.0	13.5	5.8	12.9	3.2	—	.10	.14
No. 2.....	96.0	35.5	12.9	4.9	12.3	3.3	1.4	—	—
No. 2.....	95.1	36.8	12.3	5.4	11.7	3.0	—	—	—
No. 2.....	96.4	39.5	13.0	4.8	10.6	3.2	1.4	—	—
No. 2.....	95.7	41.0	13.0	4.8	10.0	3.1	1.5	—	—
No. 3.....	90.0	34.5	15.0	5.4	13.0	3.2	—	.07	.15
No. 3.....	93.0	35.0	12.4	5.0	11.9	3.0	—	.08	.14
No. 3.....	90.1	36.0	12.9	5.9	12.7	2.9	—	.08	.14
No. 3.....	90.2	39.0	13.3	5.2	11.6	3.5	—	.08	.15
No. 3.....	93.4	39.4	12.8	5.1	11.1	3.2	—	.07	.13
No. 3.....	91.3	40.0	13.4	5.3	11.8	3.5	—	.07	.14
No. 4.....	85.6	37.0	13.4	4.7	11.2	3.5	—	.06	.15
Sample Grade...	87.0	37.0	12.3	6.2	10.7	3.7	—	.09	.13
Sample Grade...	86.3	37.0	13.1	5.3	13.1	3.6	—	.09	.17
Averages:									
Grade No. 1....	98.0	35.5	13.1	5.6	12.2	3.0	—	.07	.13
Grade No. 2....	95.4	36.6	12.9	5.3	11.9	3.2	—	.09	.14
Grade No. 3....	91.3	37.2	13.3	5.3	12.0	3.2	—	.08	.14
All Grades.....	93.3	36.7	13.1	5.4	12.0	3.2	1.4	.08	.14

Ground Oats

Manufacturer	Protein		Fat		Fiber		Ash	Calcium Carbonate (Calculated)	Magnesium Carbonate (Calculated)	Limestone Added (Calculated)
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed				
E. W. Bailey & Co.....	12.3	-	4.7	-	9.6	-	3.1			
	12.2	-	4.9	-	13.8	-	3.7			
Clark Mills, Inc.*.....	13.1	11.0	4.6	3.5	11.7	12.0	4.6			
	13.0	11.0	5.3	3.5	14.4	12.0	4.5			
	12.2	11.0	4.7	3.5	12.8	12.0	5.1			
Clyde Renco Milling Corp.....	10.3	-	3.6	-	16.7	-	4.4			
	10.0	-	3.5	-	16.8	-	4.3			
C. A. Cowles, Inc.....	13.5	-	4.7	-	11.0	-	3.6			
Chas. M. Cox Co.....	12.5	-	5.2	-	12.8	-	3.0			
Crosby Milling Co.....	12.9	-	4.8	-	10.9	-	3.3			
Curley Grain & Fuel Co.....	12.5	-	4.3	-	10.8	-	3.5			
	11.0	-	4.5	-	11.8	-	3.0			
Dailey Mills, Inc.....	12.4	-	4.7	-	11.0	-	3.1			
	11.8	10.75	4.1	3.0	12.9	12.0	4.5			
Doughboy Industries, Inc.....	12.6	10.75	5.1	3.0	13.2	12.0	6.7	2.5		2.5
	10.9	10.75	4.8	3.0	14.7	12.0	7.2	4.0		4.0
	11.6	10.75	5.0	3.0	14.5	12.0	7.7	3.0		3.0
	11.6	10.75	4.3	3.0	13.8	12.0	4.6			
	11.3	10.75	4.2	3.0	14.8	12.0	4.1			
	10.1	10.75	4.1	3.0	18.8	12.0	4.2			
	10.2	10.75	4.0	3.0	18.2	12.0	4.2			
	11.6	10.75	4.4	3.0	14.1	12.0	3.7			
	11.1	10.75	4.7	3.0	14.4	12.0	3.7			
	11.5	10.75	4.0	3.0	14.4	12.0	3.0			
	10.6	10.75	4.0	3.0	16.9	12.0	4.1			
	10.1	10.75	4.0	3.0	17.9	12.0	4.3			
11.2	10.75	4.6	3.0	13.1	12.0	8.9	3.5		3.5	

* Mixed Feed Oats

Ground Oats—Concluded

Manufacturer	Protein		Fat		Fiber		Ash	Calcium Carbonate (Calculated)	Magnesium Carbonate (Calculated)	Limestone Added (Calculated)
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed				
Elmore Milling Co., Inc.	13.7	—	4.3	—	10.1	—	3.6			
Eastern States Farmers' Exchange	12.7	—	5.1	—	12.3	—	3.1			
John W. Eshelman & Sons	13.0	11.5	5.1	4.5	10.6	12.0	3.3			
Essex County Cooperative Farming Association	12.6	—	5.0	—	10.8	—	3.0			
Flambeau Milling Co.	{13.6 12.3 14.3	{11.0 11.0 11.0	{4.6 4.0 4.5	{3.5 3.5 3.5	{11.2 11.7 10.1	{12.0 12.0 12.0	{4.6 4.3 3.3			
General Mills, Inc.	{12.3 15.6 14.7 13.8	{12.0 12.0 12.0 12.0	{5.0 4.5 5.4 5.6	{4.5 4.5 4.5 4.5	{15.0 10.3 10.6 12.5	{13.0 13.0 13.0 13.0	{4.1 3.7 3.6 3.8			
D. B. Hodgkins Co., Inc.	12.2	—	5.2	—	11.9	—	3.2			
LaCrosse Milling Co.	{12.5 12.7	{11.0 11.0	{4.9 4.9	{4.0 4.0	{11.9 12.0	{12.0 12.0	{4.0 3.8			
McCabe Grain Co., Ltd.	12.8	—	4.3	—	12.4	—	3.8			
National Oats Co.	12.4	12.0	3.7	3.0	14.9	13.0	4.1			
Northern Illinois Cereal Co.	{13.2 13.4	{11.5 11.5	{5.2 5.5	{5.5 5.5	{11.8 13.2	{11.5 11.5	{4.5 3.5			
Northern Supply Co.	{12.6 12.8	{11.0 12.0	{4.4 5.4	{3.5 3.5	{13.4 11.4	{12.0 12.0	{5.1 4.9			
St. Cloud Milling Co.	{12.4 11.0 12.8 11.8	{10.0 10.0 10.0 10.0	{5.2 4.3 5.3 4.8	{3.5 3.5 3.5 3.5	{14.3 15.5 12.5 13.4	{12.5 12.5 12.5 12.5	{4.9 4.2 5.0 3.7			

Schaefer Oat Products.....	11.6	11.0	4.1	3.25	12.8	12.75	6.1		
	112.6	11.0	3.9	3.25	16.6	12.75	6.3		
F. J. Sennott.....	12.9	-	5.2	-	11.1	-	3.1		8.51
	9.5	-	3.8	-	14.3	-	10.4	4.71	not determined
	8.8	-	4.4	-	14.8	-	8.8	3.50	8.95
Van Dam & Sons.....	9.1	-	3.0	-	15.4	-	11.6	4.75	8.12
	9.4	11.0	4.1	3.0	14.5	12.0	10.8	4.37	8.66
	9.1	11.0	3.5	3.0	14.9	12.0	11.8	4.63	
	10.6	11.0	3.9	3.0	15.8	12.0	4.3		
H. K. Webster Co.....	12.7	-	5.3	-	11.7	-	3.5		
	13.3	-	3.5	-	13.0	-	3.2		
	12.1	-	4.5	-	16.2	-	4.8		
	13.2	-	6.1	-	10.2	-	3.5		
Wisconsin Milling Co.....	12.8	10.5	5.8	4.0	10.5	12.0	4.8		
	13.1	10.5	5.8	4.0	11.3	12.0	5.0		

Poultry Feeds with an Ash Content in Excess of 11 Percent

For some time it has been the practice of the Control Service to determine the acid insoluble ash in the mixed feeds containing over 11 percent ash. So far as the Control Service is concerned an ash content of 11, 12 or 13 percent is, in itself, not objectionable. The purpose of the acid insoluble ash determination is to make sure that the high ash is not, in part, composed of sand or grit added without being declared in the list of ingredients.

The following table lists 24 feeds. It may be noted that the ash varies from 11.1 to 13.6 percent, and the acid insoluble ash from 0.4 to 3.7 percent.

Four feeds of one manufacturer were found to have an acid insoluble ash content of from 2.9 to 3.7 percent. This manufacturer was using, as one of the ingredients, a defluorinated phosphate rock that contained about 50 percent sand. To give an acid insoluble ash content of 3.7 percent, it may be calculated that about 6 percent defluorinated phosphate rock was used, assuming 0.7 percent acid insoluble ash as the maximum normal content of mixed feeds. This means the addition of about 60 pounds of sand to every ton of feed. This manufacturer was informed that a declaration of the percentage of sand added would be required if the use of such quantities of the defluorinated phosphate rock were continued. A tentative maximum acid insoluble ash content of 1.2 percent was set as being permissible without declaration of sand or grit content. The manufacturer agreed to use other sources of inorganic phosphorus to reduce the acid insoluble ash content of the feeds in question.

The other manufacturer whose feed was found to contain 2.4 percent acid insoluble ash could not give a satisfactory explanation. He was informed also that a declaration of sand content would be required if the particular feed continued to show a high acid insoluble content.

Apparently it is possible for most feed manufacturers to market poultry mashes with an acid insoluble ash content of less than 1.2 percent. A very few manufacturers will not be permitted to use ingredients that introduce 50 or 60 pounds of sand into every ton of feed unless the labels are so marked that the purchaser knows how much added sand there is in the feed he is buying.

Poultry Feeds with an Ash Content in Excess of 11 Percent

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed		
Allied Mills, Inc. Wayne 26% Mash Supplement	28.0	26.0	4.4	3.0	9.3	10.0	11.7	0.7
Cover Grain & Feed Co. C & P Grade A Laying Mash	21.7	20.0	4.5	3.0	6.8	7.0	12.9	0.6
C & P Growing Mash	20.0	17.0	4.5	3.0	6.3	7.0	11.3	0.4
East Longmeadow Grain Store Blue Ribbon Growing Mash	21.5	20.0	5.6	3.75	6.8	6.5	11.1	0.5
Blue Ribbon Laying Mash	21.1	20.0	5.0	4.0	6.2	6.5	12.0	0.6
Eastern States Farmers' Exchange, Inc. Eastern States All-Mash Egg	17.8	15.5	4.2	3.0	6.7	8.0	11.3	0.7
Elmore Milling Co., Inc. Elmore Turkey Starting Mash	23.9	24.0	4.4	4.0	6.7	7.0	11.5	0.5
Flory Milling Co., Inc. Flory All-Mash Layer	17.6	15.5	3.5	3.5	7.7	7.5	12.4	3.3
Flory Free Range Growing Mash	16.2	16.0	3.6	3.0	8.1	7.5	12.3	2.9
Flory Laying Mash	21.3	20.0	3.8	3.5	7.4	7.5	12.6	2.9
Golden Egg Laying Mash	21.5	20.0	3.8	3.5	8.5	8.5	13.6	3.7
Fred A. Fountain. *Fountain's Laying Mash	18.2	18.0	5.3	4.0	7.2	7.0	11.6	0.9
General Mills, Inc., Larrowe Division Larro Turkey Finisher	30.7	27.0	3.9	3.5	8.2	7.5	11.2	0.5
W. K. Gilmore & Sons, Inc. Neponset Laying Mash	20.8	18.0	3.7	3.0	9.4**	6.0	12.7	1.3
Glidden Co., Feed Mill Division Glidden Laying Mash	23.7	20.0	4.9	3.0	6.4	7.0	11.3	0.7
D. H. Grandin Milling Co. Grandin's Breeder Mash	21.5	20.0	4.7	3.0	7.1	8.0	11.9	2.4
Hales & Hunter Co. Red Comb Egg Mash	23.6	20.0	4.3	3.0	7.2	7.0	12.0	0.8
Jaquith & Co. *Jaquith Growing Mash	21.1	17.0	4.6	3.5	6.9	8.0	11.6	1.2
*Jaquith Laying Mash	21.9	19.0	3.9	3.5	6.9	8.0	11.5	1.3
Park & Pollard Co., Inc. Lay or Bust Breeder Mash	21.9	20.0	4.1	2.5	6.6	7.5	13.3	1.0
*Lay or Bust Egg Mash	22.8	20.0	4.0	2.5	7.7	7.5	11.9	0.7
Lay or Bust Growing Feed	20.4	18.0	4.0	2.5	7.2	7.5	11.5	0.9
Ralston Purina Co. Purina Breeder Lay Chow	23.9	22.0	5.3	3.5	7.3	8.0	13.4	0.5
H. K. Webster Co. Blue Seal Breeder's Mash	22.5	20.0	4.9	3.5	6.6	7.0	12.3	0.6

* See also table of "Brands Substantially Complying with Guarantees."

** Fiber excessive.

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FEEDINGSTUFFS
FOR SALE IN MASSACHUSETTS IN 1948**

- Acme-Evans Co., Inc., 902 West Washington Ave., Indianapolis 9, Ind.
 Albers Milling Co., Seattle 4, Wash.
 Allied Mills, Inc., Chicago, Ill.
 American Maize-Products Co., 100 East 42nd St., New York 17, N. Y.
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago 6, Ill.
 Archer-Daniels-Midland Co., Minneapolis 2, Minn.
 Ashcraft-Wilkinson Co., 601 Trust Co. of Georgia Bldg., Atlanta 3, Ga.
 Atlantic Supply Co., 31 S. Calvert St., Baltimore 2, Md.
- E. W. Bailey & Co., Montpelier, Vt.
 Barber & Bennett, Inc., Albany, N. Y.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Foods, Inc., 1442 Marine Trust Bldg., Buffalo 3, N. Y.
 Bisbee Linseed Co., 2100 Lincoln Liberty Bldg., Philadelphia 7, Penn.
 Blatchford Calf Meal Co., Waukegan, Ill.
 Blatchley & Ballard, Inc., Middletown, Conn.
 Blish Milling Co., Seymour, Ind.
 Borden Co., Armstrong Food Co. Division, 350 Madison Ave., New York 17, N. Y.
 Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
 Borden Grain Co., West Water St., Taunton, Mass.
 Bremco Alfalfa Mills, Inc., New Bremen, Ohio
 George B. Brown Corp., Ipswich, Mass.
 Buckeye Cotton Oil Co., Cincinnati, Ohio
- Canada Linseed Oil Mills, Ltd., Montreal, Canada.
 A. B. Caple Co., Toledo 5, Ohio
 Cargill, Inc., 200 Grain Exchange, Minneapolis, Minn.
 Central Mills, Inc., Dunbridge, Ohio
 Central Soya Co., Inc., Fort Wayne, Ind.
 Clinton Industries, Inc., Clinton, Iowa
 Coatsworth and Copper, Ltd., 67 Yonge St., Toronto 1, Canada
 Commander-Larabee Milling Co., Minneapolis, Minn.
 Community Service, Inc., Canaan, Conn.
 Consolidated Chemical Industries, Inc., Woburn, Mass.
 Consolidated Products Co., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Corn Products Sales Co., 17 Battery Place, New York 4, N. Y.
 Courcy & Sons Grain Co., 12 Waverly St., Taunton, Mass.
 Cover Grain & Feed Co., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
 Curley Grain & Fuel Co., 563 Main St., Wakefield, Mass.
- Dailey Mills Inc., Olean, N. Y.
 Daily Packing Co., 431 South Dearborn St., Chicago 5, Ill.
 Dairymen's League Co-operative Assn., Inc., 11 West 42nd St., New York 18, N. Y.
 Dawe's Manufacturing Co., 4800 South Richmond St., Chicago 32, Ill.
 Decatur Milling Co., Inc., Decatur, Ill.
 Dehydrating Process Co., 10 High St., Boston 10, Mass.
 Delaware Mills, Inc., Deposit, N. Y.
 Derwood Mill, Derwood, Md.
 Frank Diauto, Randolph, Mass.
 F. Diehl & Son, Inc., Wellesley 81, Mass.
 Dietrich & Gambrell, Inc., Frederick, Md.
 Drackett Products Co., Cincinnati 32, Ohio
 J. L. Dunnell & Son, Bernardston, Mass.
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.
- Eagle Roller Mill Co., New Ulm, Minn.
 East Longmeadow Grain Store, East Longmeadow, Mass.
 Eastern States Farmers' Exchange, Inc., West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 Elk Valley Alfalfa Mills, Division of Midland Industries, Inc., Independence, Kan.
 M. W. Ellis Estate, 19 Walnut St., Peabody, Mass.
 Elmore Milling Co., Inc., Oneonta, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Assn., Topsfield, Mass.
 Excelsior Milling Co., Minneapolis, Minn.
- Farm Bureau Assn., 155 Lexington St., Waltham, Mass.
 Farmers Feed Co., 532 East 76th St., New York 21, N. Y.
 Federal Mill, Inc., Lockport, N. Y.
 Fernando Alfalfa Milling Co., 6104 Van Nuys Blvd., Van Nuys, Cal.
 Ferneau Grain Co., Blanchester, Ohio
 Finger Lakes Division of Arrow Mills, Inc., Geneva, N. Y.
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Flambeau Milling Co., Phillips, Wis.
 Flory Milling Co., Inc., Bangor, Penn.
 Fred A. Fountain, Taunton, Mass.
- J. B. Garland & Son, Inc., 15 Grafton St., Worcester, Mass.
 Gateway Milling Assn., Inc., Dart at Letchworth Streets, Buffalo 13, N. Y.
 General Foods Corp., Battle Creek, Mich.
 General Foods Corp., Aberjona Division, 209 New Boston St., Woburn, Mass.
 General Foods Corp., Franklin Baker Division, Hoboken, N. J.
 General Foods Corp., Corn Mill Division, Kankakee, Ill.

General Foods Corp., Gaines Division, 250 Park Ave., New York 17, N. Y.
 General Mills, Inc., Minneapolis, Minn.
 General Mills, Inc., Farm Service Division, Buffalo 3, N. Y.
 General Mills, Inc., Larowe Division, Detroit, Mich.
 Gerard Co., Monument & Haven Sts., Baltimore, Md.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis 6, Ind.
 Glidden Co., Soya Products Division, 5165 West Moffat St., Chicago 39, Ill.
 Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., New York, N. Y.

Hales & Hunter Co., 141 West Jackson Blvd., Chicago 4, Ill.
 D. Harbeck & Sons, New Bedford, Mass.
 Harper Feed Mills, Inc., Washington, Penn.
 Hercules Powder Co., Dairy Products Division, 332 South Michigan Ave., Chicago, Ill.
 D. B. Hodgkins Co., Inc., 30 Pearl St., Gloucester, Mass.
 Hood Mills Co., 4010 East Monument St., Baltimore 5, Md.
 H. P. Hood & Sons, Inc., 500 Rutherford Ave., Boston 29, Mass.
 E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
 Hubinger Co., Keokuk, Iowa
 Humphreys-Godwin Co., Memphis 3, Tenn.

Illinois Cereal Mills, Inc., Paris, Ill.
 Illinois Yeast Co., Princeton, Ill.
 Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.
 International Milling Co., Minneapolis 1, Minn.

Jaquith & Co., 305 Main St., Woburn, Mass.

Kansas Flour Mills Co., 1000 New York Life Bldg., Kansas City, Mo.
 Kasco Mills, Inc., Waverly, N. Y.
 Kellogg Co., Battle Creek, Mich.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 Kennel Food Supply Co., Inc., 63 Mill Hill Terrace, Fairfield, Conn.
 Keystone Dehydrators, Box 204, Nazareth, Penn.
 H. H. King Flour Mills Co., Minneapolis, Minn.
 H. C. Knoke & Co., 5728 W. Roosevelt Rd., Chicago 50, Ill.
 Kraft Foods Co., 500 Peshtigo Court, Chicago 90, Ill.
 Chas. A. Krause Milling Co., Milwaukee, Wis.
 Kronick's Coal & Grain Co., 43 Pleasant St., Adams, Mass.
 Kuder Citrus Pulp Co., Lake Alfred, Florida

Larabee Flour Mills Co., 20 West 9th St., Kansas City 6, Mo.
 Lauhoff Grain Co., Danville, Ill.

Mackenzie & Winslow, Inc., Fall River, Mass.
 Maine Fish Meal Co., Union Wharf, Portland, Maine
 Mansfield Milling Co., Mansfield, Mass.
 Maritime Milling Co., Inc., Buffalo 2, N. Y.
 Merrimack Farmers' Exchange, Inc., Concord, N. H.
 Methuen Grain Co., Methuen, Mass.
 Midland Flour Milling Co., North Kansas City 16, Mo.
 Miner-Hillard Milling Co., Wilkes-Barre, Penn.
 Geo. O. Moon & Co., Inc., Binghamton, N. Y.
 Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.
 Mount Vernon Milling Co., Mount Vernon, Ind.

National Alfalfa Dehydrating & Milling Co., Lamar, Col.
 National Biscuit Co., 440 West 14th St., New York 14, N. Y.
 National Biscuit Co., Shredded Wheat Bakeries, Niagara Falls, N. Y.
 National Biscuit Co., Toledo Mill, 2221 Front St., Toledo, Ohio
 National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
 Near's Food Co., Inc., 115 Montgomery St., Binghamton, N. Y.
 Neumond Co., 300 Merchants Exchange Bldg., St. Louis, Mo.
 New Bedford Fish Products Corp., 2 Washburn St., New Bedford, Mass.

Ogden Grain Co., Utica, N. Y.
 Old Trusty Dog Food Co., 278 West St., Needham Heights, Mass.
 Oswego Soy Products Corp., Oswego, N. Y.

Pabst Brewing Co., Peoria, Ill.
 Palm Grain Co., 1081 Gorham St., Lowell, Mass.
 Phillip R. Park, Inc., Outer Harbor, San Pedro, Cal.
 Park & Pollard Co., Inc., 356 Hertel Ave., Buffalo 7, N. Y.
 George H. Parker Grain Co., Danvers, Mass.
 Pasco Packing Co., Dade City, Florida
 Patent Cereals Co., Geneva, N. Y.
 Penick & Ford Ltd., Inc., Cedar Rapids, Iowa
 Pillsbury Mills, Inc., Minneapolis 2, Minn.
 Pittsford Flour Mills, Inc., Schoen Place, Pittsford, N. Y.
 R. C. Pratt, 68 King St., East, Toronto, Ont., Canada
 Publicker Industries, Inc., 1429 Walnut St., Philadelphia, Penn.

Quaker Oats Co., 141 West Jackson Blvd., Chicago 4, Ill.

Ralston Purina Co., St. Louis, Mo.
 John Reardon & Sons Division of Wilson & Co., Inc., Cambridge 39, Mass.
 D. F. Riley, North Hatfield, Mass.
 Rodney Milling Co., Kansas City 8, Mo.

Russell-Miller Milling Co., 900 Midland Bank Bldg., Minneapolis 1, Minn.
Ryther & Warren Co., Belchertown, Mass.

Saunders Mills, Inc., Box 1436 Central Station, Toledo, Ohio
Schenley Distilleries, Inc., 350 Fifth Ave., New York 1, N. Y.
Schoeneck Farms, Inc., Nazareth, Penn.
Sea Board Supply Co., 35th St. & Gray's Ferry Ave., Philadelphia 46, Penn.
Joseph E. Seagram & Sons, Inc., Louisville, Ky.
Security Food Co., 521 South Third St., Minneapolis 15, Minn.
Shearer's Dried Milk Products Corp., Philadelphia, Penn.
Shellabarger Mill & Elevator Co., Salina, Kan.
Sherwin-Williams Co., Cleveland, Ohio
W. J. Small Co., Inc., Kansas City 6, Mo.
Allen V. Smith, Inc., Marcellus Falls, N. Y.
A. E. Staley Manufacturing Co., Decatur, Ill.
Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
D. A. Stickell & Sons, Inc., 67 West Baltimore St., Hagerstown, Md.
Stratton & Co., Concord, N. H.
Sunny Slope Farms, Inc., Nazareth, Penn.
Sunshine Biscuits, Inc., 20-10 Thomson Ave., Long Island City, N. Y.
Swift & Co., Union Stock Yards, Chicago 9, Ill.

Taunton Grain Co., Taunton, Mass.
Texas Citrus Feed Mills, Inc., 949 W. Huisache Ave., San Antonio 1, Texas.
Tioga Mills, Inc., Waverly, N. Y.
Toledo Soybean Products Co., Toledo, Ohio

Union Starch & Refining Co., Columbus, Ind.
United Cooperative Farmers, Inc., Fitchburg, Mass.
United Distillers of America, Inc., Gethsemane, Ky.
United Farmers of New England, Inc., Charlestown, Mass.
United Mills Co., Inc., Grafton, Ohio
Unity Feeds, Inc., 177 Milk St., Boston, Mass.
Universal Grain Co. of New Jersey, 425 South St., Newark, N. J.
George Urban Milling Co., 332 North Oak St., Buffalo 3, N. Y.

Valier & Spies Milling Co., (Trade Name) of Flour Mills of America, Inc., St. Louis, Mo.
Arthur Ventura Grain Co., Taunton, Mass.
Vita-Vim Millers, 135 Scott St., Buffalo 4, N. Y.

Hiram Walker & Sons, Inc., Peoria, Ill.
C. P. Washburn Co., Middleboro, Mass.
Wayne County Grangers Feed Corp., Clyde, N. Y.
H. K. Webster Co., Lawrence, Mass.
Western Condensing Co., 935 East John St., Appleton, Wis.
Western Condensing Co., Golden Eagle Milling Co., Distributors, Petaluma, Cal.
Whitmoyer Laboratories, Inc., Meyerstown, Penn.
Stanley Wood Grain Co., Taunton, Mass.
Woods & Sprague Milling Co., Inc., Albion, N. Y.
Worcester Grain & Coal Co., Worcester, Mass.

Yieldmor Feeds Division of Central Grain and Malting Co., Piqua, Ohio

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 137

JULY 1948

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventy-fifth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67 Acts of 1933.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1948

By Fertilizer Control Service Staff:

John W. Kuzmeski, *Official Chemist, in Charge*
Albert F. Spelman, *Senior Chemist*
C. Tyson Smith, *Assistant Chemist*
Robert T. Wetherbee, *Assistant Chemist*
Joseph A. Bart, *Junior Chemist*

W. Noel Jameson, *Technical Assistant*
Joseph A. Martell, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Senior Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesium.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1

Tonnage fee: 6 cents per ton of 2,000 pounds

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

MANUFACTURERS AND BRANDS

Registrations have been perfected in Massachusetts during 1948 by 59 firms, covering 250 brands of mixed fertilizer and unmixed fertilizing materials.

The following brands were not found on display by the sampling agent at any point in the State and therefore do not appear in the tables of analyses.

Brands of Fertilizer Registered but Not Sampled

American Liquid Fertilizer Co., Inc. Liqua-Vita 6-9-7	McCormick & Co., Inc. Hy-Gro 13-26-13
Apothecaries Hall Co. Liberty Tobacco Starter 5-5-15 Liberty High Grade Market Gardeners (with Sulphate Potash) 5-8-7 Bone Meal (2.25-22-0) Castor Pomace (4.5-0-0) Muriate Potash 60% (0-0-60) Super Phosphate 20% (0-20-0) Sheep Manure (1-0.5-1)	Old Deerfield Fertilizer Co., Inc. Old Deerfield Lawnshrub 6-5-5 Old Deerfield 8-16-16, 2% magnesium oxide
Armour Fertilizer Works Armour's Big Crop 0-14-14 Armour's Big Crop 4-12-4 Armour's Big Crop 4-12-8 Armour's Big Crop 8-16-16 Armour's Special Ornamental 10-6-4 Armour's Shredded Cattle Manure (1.5-1-1)	Plantspur Products Co. Plantspur 4-4-2
Joseph Breck & Sons Corp. Breck's Country Club 8-6-2	Premier Peat Moss Corp. Premier-Nure (2-1-1)
Ross Daniels, Inc. Ross Nutrient Cartridges 8-16-8	Rogers & Hubbard Co. Hubbard Golf Course 8-6-2 Red H 4-12-8 Red H 5-10-5 Red H 8-16-16 Gro-Fast Cow Manure (2-1-1)
Davey Tree Expert Co. Davey Tree Food 12-4-4	Ruhm Phosphate & Chemical Co. Red Seal Brand Ruhm's Phosphate Rock 30% (0-30-0)
E. I. du Pont de Nemours & Co. Du Pont Uramon Fertilizer Compound (42-0-0)	O. M. Scott & Sons Co. Scotts Lawn Food plus Weed Control 7-11-5
Eastern States Farmers' Exchange, Inc. Eastern States 10-20-0	Scars, Roebuck & Co. Cross Country Bulb Food 4-12-8 Cross Country Evergreen Food 8-6-4 Cross Country Liquid Plant Food 10-5-5 Cross Country Steamed Bone Meal (2-20-0) Cross Country Sulfate of Ammonia (20-0-0) Cross Country Peat Manure (1-2-1)
Faesy & Besthoff, Inc. Rose Food 8-10-4	Tennessee Corp. Es-Min-El
Frank's Market Garden Green Thumb 0.9-0.9-0.9	Thomson Phosphate Co. Four Leaf Powdered Rock Phosphate (Florida) (0-31-0)
Humbreys-Godwin Co. Dixie Brand 41% Protein Prime Cottonseed Meal (6.58-0-0)	Universal Chemical Co. Electra Plant Food 5-10-3
International Minerals & Chemical Corp. International Muriate of Potash (0-0-60)	Woodruff Fertilizer Works, Inc. Woodruff's 5-8-7
Kerr Manufacturing Co. Quick Growth 4-8-4	

FERTILIZER TONNAGE
Tonnage of Fertilizers Sold in Massachusetts

	1946		1947	
	Jan. 1 to July 1	July 1 to Dec. 31	Jan. 1 to July 1	July 1 to Dec. 31
Mixed fertilizers.....	62,960	6,668	57,983	6,335
Fertilizer chemicals and materials unmixed.....	8,556	4,153	9,384	3,332
Pulverized animal manures.....	1,446	527	1,272	256
Totals.....	72,962	11,348	68,639	9,923

Tonnage of Mixed Fertilizers, January 1, 1947, to December 31, 1947

Grade*	Tonnage		Brands	Grade*	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31			Jan. 1 to July 1	July 1 to Dec. 31	
5-8-7	15,902	1,182	19	8-7-3	117	29	—
5-10-10	13,651	655	20	13-30-0	110	3	—
6-3-6	9,434	103	13	0-20-20	65	18	—
7-7-7	5,423	1,252	12	5-15-15	60	18	—
4-12-4	3,914	486	11	6-8-6	43	51	—
5-10-5	3,031	172	16	4-10-0	40	—	—
8-16-16	1,499	25	5	10-6-4	35	2	—
3-12-6	626	15	—	5-5-15	23	—	—
8-6-4	492	142	—	5-8-5	23	2	—
8-24-8	453	—	—	0-14-7	21	2	—
10-10-10	447	319	—	6-7-4	13	—	—
5-15-10	416	359	—	7-8-5	12	1	—
0-14-14	354	423	6	9-9-9	12	6	—
6-10-4	352	139	—	5-10-3	—	434	—
8-6-2	328	110	—	4-12-16	—	118	—
3-12-12	298	162	—	4-8-4	—	32	—
4-12-8	278	27	—	0-19-19	—	15	—
8-4-8	214	10	—	Miscellaneous	23	23	19
6-5-5	147	—	—	TOTALS	57,983	6,335	159
5-3-5	127	—	—				

* The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1, 1947, to December 31, 1947

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Superphosphate.....	3,912	1,264	9
Nitrate of soda.....	2,165	242	—
Milorganite.....	1,295	730	—
Bone meal.....	548	233	10
Muriate of potash.....	488	213	7
Cottonseed meal.....	288	380	—
Cyanamid.....	181	16	—
Fish.....	135	—	—
Phosphate rock.....	120	40	—
Ammonium nitrate.....	92	175	—
Castor pomace.....	62	4	—
Sulfate of ammonia.....	52	1	—
Bore and tankage.....	31	9	—
Tankage.....	—	25	—
Miscellaneous.....	15	—	—
TOTALS.....	9,384	3,332	50

MIXED FERTILIZERS

Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
American Agricultural Chemical Co.	30	17	89	9	4	0	1
Apothecaries Hall Co.	15	15	46	0	0	0	0
Armour Fertilizer Works	7	5	21	1	1	0	0
Associated Seed Growers, Inc.	1	1	3	0	0	0	0
F. A. Bartlett Tree Expert Co.	1	1	3	0	0	0	0
Joseph Breck & Sons Corp.	5	0	17	1	3	0	1
Consolidated Rendering Co.	15	12	44	1	2	0	0
Davison Chemical Corp.	7	2	20	7	1	1	1
Eastern States Farmers' Exchange, Inc.	14	10	54	0	1	0	4
Essex County Co-operative Farming Association	3	2	10	1	0	0	0
Excell Laboratories	1	1	3	0	0	0	0
Frost & Higgins Co.	1	1	3	0	0	0	0
Goulard & Olena, Inc.	5	3	15	0	1	0	1
Hydroponic Chemical Co., Inc.	1	1	3	0	0	0	0
Hy-Trous Corp.	2	2	6	0	0	0	0
International Minerals & Chemical Corp.	21	12	68	5	4	0	0
Miller Chemical & Fertilizer Corp.	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	14	13	42	1	0	0	0
Olds & Whipple, Inc.	10	9	30	0	0	1	0
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbs Corp.	1	1	3	0	0	0	0
Ralston Purina Co.	1	1	3	0	0	0	0
Rogers & Hubbard Co.	11	11	32	0	0	0	0
O. M. Scott & Sons Co.	1	0	3	0	1	0	0
Sears, Roebuck & Co.	3	3	9	0	0	0	0
M. L. Shoemaker Div. of Wilson & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	1	1	3	0	0	0	0
Swift & Company Plant Food Div.	4	3	12	1	0	0	0
Tennessee Corp.	2	2	6	0	0	0	0
C. P. Washburn Co.	2	1	6	0	1	0	0
TOTALS	182	133	562	27	19	2	8

Explanation of Table of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton

This table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More per Ton

Name of Manufacturer Place Sampled, and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Approximate Commercial Shortage Per Ton
	Water Insoluble	Total			
Davison Chemical Corp. Checkerboard Feed Store, Fitchburg Davco Granulated 7-7-7.....	.07	6 25	6 70	6 79	\$3.83
Ra-Pid-Gro Corporation Joseph Breck & Sons Corp., Boston Ra-Pid-Gro 23-21-17	none	22.49	21.30	15 43	<i>a</i>

a Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient mixtures.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
American Agricultural Chemical Co.		
Agrico Phosphate & Potash 0-14-14	1	—
Agrico for Corn 3-12-6	1	.19
Agrico for Seeding Down 3-12-12	1	.09
Agrico for Cranberries 5-8-7	1	.17
Agrico for New England 5-8-7	5	.15
Agrico for Gardens 5-10-5	1	.31
Agrico for Onions 5-10-5	1	.20
Agrico for Potatoes 5-10-10	3	.14
Agrico for Tobacco 6-3-6	7 a	2.53
Agrico Broadleaf Evergreens 6-10-4	1	.44
Agrico Country Club Fertilizer 6-10-4	1	.54
Agrico for Lawns, Trees & Shrubs 6-10-4	1	.51
Agrico for Cranberries 7-7-7	1	.18
Agrico for Top Dressing 7-7-7	4	.11
Agrico Country Club Fertilizer 8-6-2	1	1.67
Apothecaries Hall Co.		
Liberty Fertilizer 4-12-4	1	.53
Liberty High Grade Market Gardeners 5-8-7	3	.44
Liberty Fertilizer 5-10-5	2	.62
Liberty Fertilizer 5-10-10	2	.48
Liberty Fertilizer (with 2% Magnesium Oxide) 5-10-10	1	.22
Liberty Tobacco Mixture 6-3-6	2 a	3.14
Liberty Tobacco Mixture (with Cotton Hull Ashes) 6-3-6	2 a	3.75
Liberty Green-Gro 6-7-4	1	.94
Liberty Fertilizer Special for Fruit & Grass 7-7-7	1	.53
Armour Fertilizer Works		
Armour's Big Crop Tobacco Plant Bed Special 4-12-4	1 a	.49
Armour's Big Crop 5-8-7	1	.26
Armour's Big Crop 5-10-5	1	.30
Armour's Velvetreen Plant Food 5-10-5	1	.26
Armour's Big Crop 5-10-10	1	.16
Armour's Big Crop Tobacco Special 6-3-6	1 a	2.60
Armour's Big Crop Fertilizer 7-7-7	1	.19
Associated Seed Growers, Inc.		
Japedizer 8-6-4	1	1.92
F. A. Bartlett Tree Expert Co.		
Bartlett Green Tree Food 6-8-6	1	.45
Joseph Breck & Sons Corporation		
Brexone Garden-Gro 5-10-10, 2% magnesium oxide	2	.17
Brexone Turf-Gro 8-6-2	3	.54
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser	1	—
Corenco 4-12-4 Complete Manure	2	.08
Corenco 4-12-16 Ladino Special	1	1.13
Corenco 5-8-7 Potato and General Crop	3	.12
Corenco 5-10-5 Home Garden	1	.25
Corenco 5-10-5 Onion Special—Super Truck	1	.15
Corenco 5-10-10 Peerless Potato	2	.12
Corenco 6-3-6 Special Tobacco Grower	2 a	3.32
Corenco 7-7-7 Complete Fruit & Top Dressing	2	.13
Corenco 8-6-4 Landscape	1	.41
Davco Chemical Corporation		
Davco Granulated Fertilizer 0-14-14	1	—
Davco Granulated Fertilizer 4-12-4	1	.05
Davco Granulated Fertilizer 4-12-8	1	.06
Davco Granulated Fertilizer 5-8-7	1	.06
Davco Granulated Fertilizer 5-10-5	1	.06
Davco Granulated Fertilizer 5-10-10	1	.05
Eastern States Farmers' Exchange, Inc.		
Eastern States 0-19-19 with Borax, 1% magnesium oxide	1	—
Eastern States 0-20-20, 1% magnesium oxide	1	—
Eastern States 5-10-5 Garden, 2% magnesium oxide	1	.25
Eastern States 5-10-10, 2% magnesium oxide	1	.15
Eastern States 5-15-10, 1% magnesium oxide	3	.15
Eastern States 5-15-15, 1% magnesium oxide	1	.16
Eastern States 8-4-8 Tobacco, 2% magnesium oxide	2 a	3.28
Eastern States 8-12-16 Low Chlorine, 1% magnesium oxide	1 b	.22
Eastern States 8-16-16, 1% magnesium oxide	1	.22
Eastern States 8-16-16, 2% soluble magnesium oxide	1	.18
Eastern States 10-10-10, 2% magnesium oxide	1	.15

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Essex County Co-operative Farming Association		
S-X Brand 5-8-7.....	1	.15
S-X Brand (2% magnesium oxide) 5-10-10.....	1	.14
S-X Brand 7-7-7.....	1	.15
Excell Laboratories		
New Plant Life 2-1-2.....	1	none
Frost & Higgins Co.		
Frost & Higgins Special Tree and Shrub Food 8-6-4.....	1	.47
Goulard & Olena, Inc.		
G & O Rhodo-Azalea-Camellia 3-20-3.....	2	.99
G & O Dahlia Gladiola, Bulb Food 5-6-15.....	1	2.02
G & O Rose Food 7-8-5.....	2	.81
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19.....	1	none
Hy-Trous Corporation		
Hy-Trous 4-8-4.....	2	none
International Minerals & Chemical Corporation		
International 0-14-14.....	2	—
International 4-12-4.....	2	.18
International 4-12-8.....	1	.17
International 5-8-7.....	3	.12
International Fertilis 5-10-5.....	1	.15
International 5-10-10.....	2	.09
International Caribee 5-10-10, 2% magnesium oxide.....	1	.40
International Potato 5-10-10, 2% magnesium oxide.....	1	.13
International Special Potato 5-10-10 5% magnesium oxide (Potash as Sulphate).....	1 a	.08
International Tobacco 6-3-6.....	2 a	2.46
International 7-7-7.....	2	.16
International Fruit 7-7-7, 3% magnesium oxide.....	1	.23
International Lawn 8-6-2.....	1	.52
International 8-16-16, 1 1/2% magnesium oxide.....	1	.15
Miller Chemical & Fertilizer Corporation		
Miller VHPF 5-25-15.....	1	none
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 0-14-14.....	1	—
Old Deerfield 4-12-8.....	1	.25
Old Deerfield 5-8-7 All Crop Fertilizer.....	3	.19
Old Deerfield 5-8-7, 2% magnesium oxide, Potash other than Muriate.....	2 a	.12
Old Deerfield 5-10-5 Trucker's Special.....	1	.20
Old Deerfield 5-10-10 Potato Fertilizer.....	2	.20
Old Deerfield 6-3-6 Complete Tobacco Fertilizer.....	3 a	2.75
Old Deerfield 7-7-7 Grass Top Dressing.....	1	.16
Olds & Whipple, Inc.		
O & W 4-12-4 Market Garden Fertilizer.....	1	.71
O & W 5-3-5 Complete Tobacco Fertilizer.....	1 a	2.78
O & W 5-8-7 Potato & General Purpose Fertilizer.....	1	.50
O & W 5-10-5 Fertilizer.....	1	.60
O & W 5-10-10 Potato Fertilizer.....	1	.73
O & W 6-3-6 Blue Label Tobacco Fertilizer.....	2 a	3.15
O & W 6-3-6 Blue Label Tobacco Fertilizer, Potash derived from Cotton Hull Ash.....	2 a	3.02
O & W 7-7-7 Top Dressing & Grass Fertilizer.....	1	.74
F. G. Phillips Co.		
Ferti-Flora 3-3-3.....	1	none
Plantabbs Corp.		
Fulton's Plantabbs 11-15-20.....	1	.07
Ralston Purina Co.		
Purina Plant Food 5-10-5.....	1	.22
Rogers & Hubbard Co.		
Gro-Fast Plant Food 5-8-5.....	1	1.76
Hubbard Potato 5-8-7.....	1	.94
Hubbard High Potash 5-10-10.....	1	.93
Hubbard Tobacco Grower 6-3-6.....	3 a	2.90
Red H 0-14-14.....	1	—
Red H 4-12-4.....	1	.19
Red H 5-8-7.....	1	.21
Red H 5-10-10.....	1	.21
Red H 7-7-7.....	1	.17

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
O. M. Scott & Sons Co.		
Scotts Turf Builder 8-7-3	1	1.18
Sears, Roebuck & Co.		
Cross Country Plant Food 4-12-4	1	.14
Cross Country Rose Food 5-10-5	1	.26
Garden Master 5-10-5 Plant Food	1	.15
M. L. Shoemaker Division of Wilson & Co., Inc.		
M. L. Shoemaker's Swift-Sure 4-10-0	1	.84
Smith Agricultural Chemical Co.		
Sacco 4-12-4	1	.43
Swift & Company, Plant Food Division		
Blenn 5-10-5	1	.17
Brimm 5-10-10	1	.11
Vigoro 4-12-4	2	.38
Tennessee Corporation		
Loma 5-10-5	1	.28
Loma 8-8-8 Mineralized	1	.24
C. P. Washburn Co.		
Market Garden 5-8-7	1	.15
Special Potato 5-10-10	1	.15

a Potash in forms other than muriate.

b Potash: 15.46% as sulfate; .94% as muriate.

NITROGEN COMPOUNDS

Agrinite, Ammonium Nitrate, Calcium Cyanamid, Cottonseed Meal,
Nitrate of Soda, Sulphate of Ammonia

	Nitrogen	
	Found	Guaranteed
American Agricultural Chemical Co.		
Agrinite All Organic Plant Food.....	8.62	8.25
American Cyanamid Co.		
Aero-Cyanamid 20.6%.....	21.21	20.60
Aeroprills Ammonium Nitrate Fertilizer Compound.....	33.96	33.50
Chilean Nitrate Sales Corp.		
Chilean Nitrate of Soda—Champion Brand.....	16.10	16.00
Chilean Nitrate of Soda—Champion Brand.....	16.08	16.00
Chilean Nitrate of Soda—Champion Brand.....	16.08	16.00
Davison Chemical Corp.		
Arcadian Nitrate of Soda 16%.....	16.13	16.00
Ford Motor Co.		
Ford Ammonium Sulphate.....	21.10	20.80
L. B. Lovitt & Co.		
Lovitt Brand 41% Protein Cottonseed Meal.....	6.65	6.56
Lovitt Brand 41% Protein Cottonseed Meal.....	6.52	6.56
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield Sulfate of Ammonia.....	20.96	20.50

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Dry Ground Fish, Animal Tankage, Milorganite

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid		Available Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed
Apothecaries Hall Co.						
Dry Ground Fish...	10.64	9.90	6.43	5.00	—	—
Old Deerfield Fertilizer Co., Inc.						
Dry Ground Fish...	9.11	9.00	7.45	5.00	—	—
Rogers & Hubbard Co.						
Dry Ground Fish Meal....	10.41	9.56	6.96	5.00	—	—
N. Roy & Son						
Animal Tankage....	8.92	7.00	9.60	—	8.65	8.00
Sewerage Commission of the City of Milwaukee						
Milorganite.....	6.05	6.00	3.18	—	2.54	2.00
Milorganite.....	6.12	6.00	3.18	—	2.64	2.00

Ground Bone

Manufacturer	Nitrogen		Total Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
American Agricultural Chemical Co.	3.43	2.00	25.60	23.00
Armour Fertilizer Works.	2.86	2.47	26.35	23.00
Consolidated Rendering Co.	{ 3.85 2.59	{ 3.70 2.00	{ 20.36 25.25	{ 20.00 23.00
Faesy & Besthoff, Inc.	{ 3.07 2.94	{ 2.47 2.25	{ 24.45 27.80	{ 23.00 27.00
A. H. Hoffman, Inc.	{ 4.15 4.04	{ 3.70 3.70	{ 25.15 25.35	{ 20.00 20.00
International Minerals & Chemical Corp.	4.07	3.70	19.85	20.00
John Reardon & Sons Division of Wilson & Co., Inc.	2.55	2.00	26.98	18.00
Rogers & Hubbard Co.	{ 3.33 4.14	{ 2.00 4.00	{ 25.80 24.94	{ 23.00 23.00

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid Found	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co. 18% Normal Superphosphate	18.60	18.00	18.00
18% Normal Superphosphate (a)	19.25	18.71	18.00
Armour Fertilizer Works Armour's Superphosphate 20%	20.55	19.73	20.00
Consolidated Rendering Co. Coreco Superphosphate 20%	20.90	20.74	20.00
Eastern States Farmers' Exchange, Inc. Eastern States Superphosphate 20%	21.60	20.18	20.00
International Minerals & Chemical Corp. International Superphosphate 20%	21.40	20.02	20.00
Old Deerfield Fertilizer Co., Inc. Old Deerfield Superphosphate 20%	20.85	20.73	20.00
Rogers & Hubbard Co. Superphosphate 20%	20.40	20.38	20.00

a Composite of two samples

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Eastern States Farmers' Exchange, Inc.	60.60	60.00
Old Deerfield Fertilizer Co., Inc.	59.30	60.00

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash
American Agricultural Chemical Co.			
Pulverized Sheep Manure (1.25-1-2)	1.54	1.58	4.61
Armour Fertilizer Works			
Pulverized Sheep Manure (1.25-1-2)	1.70	1.43	1.82
Atkins & Durbrow, Inc.			
Driconure (2-1-1)	3.01	3.30	1.98
Consolidated Rendering Co.			
Corenco Sheep Manure (1.25-1-2)	1.67	1.28	4.55
Spurz-on (3.5-3.5-1.5)	5.25	4.40	1.98
A. H. Hoffman, Inc.			
Cow Manure (Dehydrated) (2-1-1)	2.27	1.55	2.27
Poultry Manure (Dehydrated) (3-1-1.5)	4.18	2.90	2.19
Sheep Manure (Kiln-Dried) (1.5-1-2)	1.57	1.23	4.40
International Minerals & Chemical Corp.			
Sheep Manure (1.25-1-2)	1.67	1.68	2.02
Norwood Brand Fertilizer Co.			
Norwood Brand Sheep Manure Screened from Wool (1.5-.35-2.75)	1.40	.38	3.37
Pulverized Manure Co.			
Wizard Brand Cow Manure (2-1-1)	1.86	1.20	1.98
Wizard Brand Pulverized Sheep Manure (2-1-2)	1.61	1.63	2.31
Rogers & Hubbard Co.			
Gro-Fast Sheep Manure (1.25-1-2)	1.42	.84	2.11
Sears, Roebuck & Co.			
Cross Country Cow Manure (1.75-1-2)	1.49	1.19	2.44
Cross Country Sheep Manure (1.5-1-2)	1.53	1.15	2.35
Garden Master Sheep Manure (1.75-8-3)	2.17	1.30	3.00
Stockdale Fertilizer Co.			
Ovene (sheep manure) (2-1-2)	2.33	1.78	2.33
Swift & Company, Plant Food Division			
Cattle Manure (1.85-.75-1.75)	1.99	1.13	1.88
Sheep Manure (2-1-2)	2.00	1.70	3.64
Walker-Gordon Laboratory Co.			
Bovung (2-1-1)	2.04	1.63	2.40

AGRICULTURAL LIME PRODUCTS

Manufacturers and Brands

During 1948, 11 firms registered for sale in Massachusetts 23 brands of lime products, manufactured and sold for neutralizing acid soils. The products are grouped as follows:

Hydrated or slaked lime.....	15
Ground limestone.....	8
	<hr/>
	23

The analytical results which appear in this bulletin represent officially drawn samples secured by the same sampling agents who drew the samples of commercial fertilizer which served for the inspection of that commodity; the samples therefore came from every section of the State and are, we believe, representative of the lime products sold in Massachusetts as soil amendments.

We were not successful in securing samples of the following brands:

Conklin Limestone Co., Inc., Canaan, Conn.

High Magnesium Agricultural Ground Limestone

Kelly Island Lime & Transport Co., 1122 Leader Bldg., Cleveland, Ohio

Tiger All Purpose Hydrated Lime

Limestone Products Corporation of America, 122 Main St., Newton, N. J.

Limecrest Brand of Agricultural Hydrated Lime

New England Lime Co., Adams, Mass.

Nelco Agricultural Ground Limestone (Canaan, Conn.)

Vermont Associated Lime Industries, Inc., Green Mountain Lime Division, Winooski, Vt.

Sure Crop Agricultural Lime Hydrated

Explanation of Table of Analyses

Tables I and II: "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "percent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "percent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical analysis" the figures represent the percentage of product that would pass or be retained by the meshed sieves mentioned.

Table I. Hydrated or Slaked Lime

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	
Eastern States Farmers' Exchange, Inc., West Springfield, Mass.							
Eastern States Agricultural Hydrated Lime.....	47.1	47.0	34.4	31.0	91.3	1826	1.2
A. H. Hoffman, Inc., Landsville, Penn.							
Hoffman Hydrated Lime.....	66.6	70.0	2.4	1.0	68.2	1364	1.9
Lee Lime Corporation, Lee, Mass.							
Lee Double Strength Agricultural Hydrated Lime.....	47.1	45.0	34.2	29.0	92.0	1840	1.1
Lee Hydrated Lime for General Purposes.....	45.7	45.0	32.8	29.0	91.3	1826	1.1
Tobey Agra Hydrate.....	40.4	35.0	27.4	25.0	76.7	1534	1.2
New England Lime Co., Adams, Mass.							
Nelco Agricultural Hydrated Lime (Adams).....	71.2	70.0	1.6	0.5	73.1	1462	1.5
Nelco Agricultural Hydrated Lime (Canaan, Conn.).....	45.2	47.0	33.0	31.0	87.6	1752	1.9
Nelco Land Lime (Canaan, Conn.).....	41.5	35.0	29.2	25.0	81.8	1636	2.1
United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.							
Red Top General Purpose Hydrated Lime (Farnams).....	69.4	70.0	1.4	trace	70.4	1408	1.2
USG Hydrate Lime—Agricultural (Farnams).....	70.3	70.0	2.6	trace	71.5	1430	2.4
Vermont Associated Lime Industries, Inc., Green Mountain Lime Division, Winooski, Vt.							
Green Mountain Handy Hydrate.....	66.1	60.0	4.1	1.0	71.7	1434	2.2
Snow Fluff Agricultural Hydrated Lime.....	67.7	65.0	5.8	1.0	73.9	1478	2.3

Table II. Ground Limestone

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter		Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh	
Allied Minerals, Inc., Adams, Mass. Hoeze Agricultural Limestone.....	53.5	52.0	0.7	0.5	54.2	1084	2.2	88.9	none	
Lee Lime Corporation, Lee, Mass. Lee Pulverized Limestone..... Tobey Pulverized Limestone.....	31.0 42.0	30.0 35.0	21.1 8.8	20.0 7.0	58.1 54.0	1162 1080	3.2 5.8	60.0 91.6	0.3 none	
Limestone Products Corporation of America, Newton, N. J. Lime Crest—Calcite Pulverized Limestone.....	42.7	42.0	5.2	2.0	49.1	982	11.5	78.9	2.2	
Mittler Lime Products Co., West Stockbridge, Mass. Monarque Agricultural Lime-stone.....	38.9	39.0	11.0	11.0	54.0	1080	6.2	69.3	3.1	
United States Gypsum Co., 360 West Adams St., Chicago 6, Ill USG Agricultural Limestone.....	46.2	50.5	2.0	0.25	48.2	964	14.3	80.9	0.1	

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1948**

American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St. at St. Clair, Marietta, Ohio
 Apothecaries Hall Co., Waterbury 88, Conn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Associated Seed Growers, Inc., Railroad Ave., Milford, Conn.
 Atkins & Durbrow, Inc., 165 John St., New York 7, N. Y.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Joseph Breck & Sons Corp., 85 State St., Boston 9, Mass.
 Chilean Nitrate Sales Corp., 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Ross Daniels, Inc., 1217 High St., Des Moines, Iowa
 Davey Tree Expert Co., 117 South Water St., Kent, Ohio
 Davison Chemical Corp., 20 Hopkins Place, Baltimore 3, Md.
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.
 Eastern States Farmers' Exchange, Inc., 95 Elm St., West Springfield, Mass.
 Essex County Co-operative Farming Association, Topsfield, Mass.
 Excell Laboratories, 2623 Indiana Ave., Chicago, Ill.
 Faesy & Besthoff, Inc., 220 East 42nd St., New York 17, N. Y.
 Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
 Frank's Market Garden, 1398 Allen St., Springfield, Mass.
 Frost & Higgins Co., 20 Mill St., Arlington, Mass.
 Goulard & Olena, Inc., Skillman, N. J.
 A. H. Hoffman, Inc., Landisville, Penn.
 Humphreys-Godwin Co., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., Copley, Ohio
 Hy-Trous Corporation, 3 Green St., Woburn, Mass.
 International Minerals & Chemical Corporation Woburn, Mass.
 Kerr Manufacturing Co., 3 Bucknam St., Everett, Mass.
 L. B. Lovitt & Co., Memphis 3, Tenn.
 McCormick & Co., Inc., 414 Light St., Baltimore 2, Md.
 Miller Chemical & Fertilizer Corporation, 1900 South Caroline St., Baltimore 31, Md.
 Norwood Brand Fertilizer Co., Mt. Vernon St., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., 28 Sugarloaf St., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 F. G. Phillips Co., 255 Cedar St., Dedham, Mass.
 Plantabbs Corporation, 1 West Biddle St., Baltimore 1, Md.
 Plantspur Products Co., 1072 West Side Ave., Jersey City, N. J.
 Premier Peat Moss Corporation, 535 Fifth Ave., New York 17, N. Y.
 Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago 9, Ill.
 Ralston Purina Co., St. Louis 2, Mo.
 Ra-Pid-Gro Corporation, Dansville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck & Co., 925 South Homan Ave., Chicago 7, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
 M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave. & Venango St., Philadelphia
 34, Penn.
 Smith Agricultural Chemical Co., 618 North Champion Ave., Columbus, Ohio
 Stockdale Fertilizer Co., Morris, Ill.
 Swift & Company Plant Food Division, 25 Faneuil Hall Square, Boston 9, Mass.
 Tennessee Corporation, Lockland, Cincinnati 15, Ohio
 Tennessee Corporation, 621 Grant Bldg., Atlanta 1, Ga.
 Thomson Phosphate Co., 407 South Dearborn St., Chicago 5, Ill.
 Universal Chemical Co., 106 Ontario St., Lynn, Mass.
 Walker-Gordon Laboratory Co., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro, Mass.
 Woodruff Fertilizer Works, Inc., North Haven, Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 138

JULY, 1948

**Twenty-eighth Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

During the 1947-48 testing season, 605 chicken, turkey, and pheasant flocks were tested. A total of 1,297,111 samples was tested, of which only 0.10 percent were positive. The average percentage of infection was slightly lower than that of the previous season, as was also the percentage of pullorum "breaks" in negative flocks. More outstanding in the progress of eradication is the fact that 96.5 percent of all birds tested were located in 100 percent tested, non-reacting flocks.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

TWENTY-EIGHTH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1947-48

By the Poultry Disease Control Laboratory¹

INTRODUCTION

Pullorum disease eradication in Massachusetts continues to show progress. During the 1947-48 testing season more samples were tested than in any previous season. The average percentage of positive tests was less than for the previous six years. Furthermore 96.5 percent of all the birds tested were in 100 percent tested, non-reacting flocks, the largest percentage on record. Although these increases may be small; yet the trend shows definite progress toward reducing pullorum infection in Massachusetts breeding flocks. It is hoped that the poultry industry will continue to employ every possible effective means in further eliminating pullorum disease from this State.

During the past year splendid cooperation has been received from flock owners. This has enabled the laboratory to render more satisfactory service. The early testing of flocks has facilitated the testing program so that there was no marked congestion of testing during October, November, and December, and the majority of flocks was tested before the first of January. A more satisfactory and efficient service can be attained when more adequate laboratory facilities are procured. It is hoped that flock owners will continue to cooperate toward establishing and maintaining flocks free of pullorum disease.

We wish to express appreciation for the assistance given by the Extension Service, the Massachusetts Department of Agriculture, and other agencies in making this program a success.

SUMMARY OF SERVICE RENDERED

Applications received.....	636
Applications cancelled.....	31
Flocks tested.....	605
Chicken flocks.....	494
Chicken and turkey flocks.....	9
Turkey flocks.....	71
Pheasant flocks.....	29
Pheasant and chicken flocks.....	2
Number of tests.....	1,297,111
Chickens:	
Routine.....	1,240,336
Experimental.....	32,211
Fowl other than chickens:	
Routine.....	24,538
Experimental.....	26
Owners receiving necropsy service.....	86
Necropsies of reacting birds.....	180

¹ Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor; K. L. Bullis, Research Professor; G. H. Snoeyenbos, Research Professor; O. S. Flint, Assistant Research Professor; F. G. Sreeling, Assistant Research Professor; Miriam K. Clarke, Assistant Research Professor; O. M. Olesniuk, Research Assistant; E. M. Allen, Research Assistant. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

DISTRIBUTION OF TESTS AND REACTORS

Table 1 gives the number of tests and reactors by counties. A total of 1,272,547 chicken samples was tested, of which 0.10 percent were positive. Flocks were tested in 12 counties. Middlesex and Plymouth Counties led in the number of samples tested. Over 86 percent of all the samples tested were received from six counties (Bristol, Essex, Middlesex, Norfolk, Plymouth, and Worcester). Three counties (Barnstable, Dukes, and Hampshire) revealed no reactors, whereas only one county exceeded 0.5 percent positive tests.

The following breeds were tested: Bantam, Barred Plymouth Rock, Black Australorp, Brahma, Columbians, Crosses, Eisenbars, New Hampshire, Rhode Island Red, Salmon Faverolles, White American, White Leghorn, White Plymouth Rock, Wyandottes (Golden, Silver Laced, Spangled, White).

The predominating breeds were Rhode Island Red, Barred Plymouth Rock, and New Hampshire. Of the total samples 46.25 percent were taken from Rhode Island Red, 24.64 percent from Barred Plymouth Rock, 24.05 percent from New Hampshire, and the balance from the other breeds listed.

Of the 1,155,031 samples collected from females, 52,299 were from hens and 1,102,732 from pullets, with 0.03 and 0.14 percent reactors, respectively. The 117,516 samples collected from males gave 0.08 percent positive tests.

ANNUAL TESTING OF FLOCKS

The results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years are given in Table 2.

The 49 flocks tested for the first time represented 58,442 tests, of which 0.16 percent were positive. In this group 45 flocks, containing 93.34 percent of the birds, were found to be non-reacting and four flocks were positive. The average number of birds per flock was 1,143.

The group tested intermittently was the smallest of the four, both in number of flocks and in number of birds tested. The average percentage of positive tests was 0.14. Only two flocks were positive and 18, representing 89.3 percent of the birds, were non-reacting. The average number of birds per flock was 2,102.

In the group tested for two consecutive years, 60 flocks were non-reacting and five were positive. The average percentage was the highest for the four groups, which is attributed to the fact that a few flocks had a high percentage of reactors. In this group 87.2 percent of the birds tested were in non-reacting flocks. The average number of birds per flock was 1,931.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time.	49	56,009	58,442	94	0.16	41	4	3	1
Intermittent testing.	20	42,037	42,037	57	0.14	16	2	2	—
Two consecutive years.	65	125,512	132,012	440	0.33	57	3	3	2
Three or more consecutive years	360	996,399	1,040,056	698	0.07	349	4	5	2
Totals.	494	1,219,957	1,272,547	1,289	0.10	463	13	13	5

As in past years, the group tested for three or more consecutive years was by far the largest of the four and showed the smallest percentage of positive tests. A total of 353 non-reacting flocks was detected, which contained 99.01 percent of the birds. These results showed that flocks which were tested annually have made more progress in pullorum eradication than flocks tested in the other three groups. The average flock size was 2,489 birds.

For the four groups as a whole, 494 flocks were tested, representing 1,219,957 birds and 1,272,547 samples, of which 0.10 percent were positive. The 463 flocks which were 100 percent tested and non-reacting contained 1,178,094 birds or 96.51 percent of the total birds tested. Only 18 flocks were classified as positive, representing 34,105 birds or 2.79 percent of the total birds tested.

During the past year 137 or 24 percent of the flocks tested in 1946-47 did not test this season. This is a larger percentage than dropped out the previous season, suggesting the possibility that the production of hatching eggs and chicks is reverting to the better-established poultry breeder.

The above data show that annual testing is effective in establishing and maintaining pullorum-clean flocks. Flock owners who adopt this program along with other effective measures are likely to succeed in developing a pullorum-clean flock.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

During the past year reactors were found in 16 flocks which had been non-reacting the previous year. Table 3 gives the testing results for these flocks. The sixteen flocks had been negative for a varying number of years as follows: four for one year; two for two years; three for three years; three for four years; one for six years; two for seven years; one for eleven years.

Thirteen flocks had less than 0.5 percent reactors on the original test. One flock (No. 11) had 16.39 percent reactors. Eleven flocks obtained a negative test through partial or 100 percent retests. Partial retesting is not recognized if it is not followed by a complete retest. In most cases the first retest was negative. Three flocks were not subjected to retesting.

In 10 flocks the origin of the infection was unknown. In the remaining six flocks the infection might be attributed to either the purchase of questionable stock or inadequate disease prevention measures.

While the number of "breaks" was less than the previous year, it is still evident that some flock owners are not as vigilant as they might be in keeping pullorum disease out of their flocks. The following summary gives the incidence of "breaks" among Massachusetts tested flocks for the past nine years.

Year	Number of Flocks	Breaks		Flocks with less than 0.5 percent infection on first test	
		Number	Percent	Number	Percent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	50.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94
1948	425	16	3.76	13	81.25

Table 3. Appearance of Infection in Flocks Previously Negative

Flock	Number of Years Negative	1947-47 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	7	3,865	3,865	0.23	Unknown
		4,900	1,496*	0.40	
		3,298	3,298*	0.00	
		2,984	2,984*	0.00	
2	2	1,762	1,762	0.005	Questionable stock
		1,760	311*	0.00	
		1,274	1,274*	0.00	
		1,800	564*	0.00	
3	1	3,497	2,697	0.22	Inadequate preventive measures
4	4	2,103	2,103	0.76	Unknown
		2,125	594*	0.00	
5	11	3,879	3,879	0.05	Questionable stock
		4,220	2,220*	0.00	
		1,987	187*	0.00	
6	7	4,449	4,449	0.09	Unknown
		4,444	660*	0.00	
		4,283	4,283*	0.00	
7	3	1,872	1,872	0.11	Questionable stock
		1,799	1,064*	0.00	
		2,628	1,564*	0.00	
		1,433	1,433*	0.00	
8	1	6,638	6,638	0.24	Unknown
		6,610	1,156*	0.00	
		4,957	4,957*	0.00	
9	4	960	960	0.63	Unknown
10	1	6,576	6,576	0.47	Inadequate preventive measures
		3,667	200*	0.50	
		10,390	1,572*	0.45	
		6,263	452*	0.00	
11	6	1,464	1,464	16.39	Unknown
12	1	1,209	1,209	0.25	Unknown
		1,206	202*	0.00	
		916	916*	0.00	
13	4	1,822	1,822	0.16	Unknown
		1,673	1,673*	0.00	
14	3	1,043	1,043	0.10	Unknown
		1,042	158*	0.00	
		1,614	1,614*	1.49	
15	3	3,038	3,038	0.03	Unknown
		3,037	387*	0.00	
		634	634*	0.00	
16	2	10,400	10,400	0.02	Unknown
		10,060	306*	0.00	

* Represents retests

The incidence of "breaks" appears to be on the decline and it is hoped that flock owners will exercise all possible precautions in keeping infection out of their flocks. "Breaks" are very costly especially after a flock owner has established a pullorum-free flock with good breeding.

Too often flock owners forget or ignore the following measures which are effective for establishing and maintaining a pullorum-free flock.

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.
7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult the Massachusetts Department of Agriculture, 41 Tremont Street, Boston, regarding additions or replacements in your flock.
8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.
9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.
10. Poultrymen should not custom hatch for untested or infected flocks (including fowl other than chickens).
11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.
12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)
13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.
14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING OF FOWL OTHER THAN CHICKENS

During the past year 24,564 fowl other than chickens were tested, 15,650 of which were turkeys. No pullorum infection was detected. The following table summarizes the results.

Fowl	Tests	Reactors	Fowl	Tests	Reactors
Turkeys.....	15,650	0	Geese.....	136	0
Pheasants.....	6,873	0	Pigeons.....	8	0
Quail.....	1,875	0	Partridge.....	10	0
Game.....	2	0			
Ducks.....	10	0	Total.....	24,564	0

As in the previous year, the majority of turkey flocks contained less than 200 birds. The following summary gives the range in flock sizes for the turkey flocks tested.

Size of Flock	Number of Flocks
0-50	22
51-100	10
101-150	10
151-200	3
201-500	16
501-1000	9
1001-2000	1

Owners of flocks of fowl other than chickens are urged to maintain strict vigilance against the introduction of pullorum infection into their flocks. The preventive measures recommended for chicken flocks apply equally well to fowl other than chickens.

NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4 the non-reacting and positive flocks are listed by counties. A total of 463 flocks, representing 1,178,094 birds, was 100 percent tested and non-reacting. Approximately 96 percent of all birds tested were in 100 percent tested, non-reacting flocks. Thirteen flocks, representing 7,758 birds, were partially tested and non-reacting. It is hoped that all flock owners will adopt the policy

Table 4. Non-reacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Non-reacting Flocks						
Barnstable.....	3	25,630	—	—	3	25,630
Berkshire.....	5	16,144	—	—	5	16,144
Bristol.....	69	141,236	2	636	71	141,872
Dukes.....	1	4,243	—	—	1	4,243
Essex.....	58	141,323	3	1,573	61	142,896
Franklin.....	20	36,924	—	—	20	36,924
Hampden.....	21	24,730	—	—	21	24,730
Hampshire.....	27	43,037	1	870	28	43,907
Middlesex.....	79	210,438	1	186	80	210,624
Norfolk.....	42	163,478	1	909	43	164,387
Plymouth.....	68	187,946	2	2,829	70	190,775
Worcester.....	70	182,965	3	755	73	183,720
Totals.....	463	1,178,094	13	7,758	476	1,185,852
Positive Flocks						
Berkshire.....	2	9,273	—	—	2	9,273
Bristol.....	2	2,789	2	1,103	4	3,892
Essex.....	3	5,409	—	—	3	5,409
Hampden.....	1	2,103	1	4,207	2	6,310
Middlesex.....	3	3,498	1	322	4	3,820
Norfolk.....	1	1,043	—	—	1	1,043
Worcester.....	1	960	1	3,398	2	4,358
Totals.....	13	25,075	5	9,030	18	34,105

of testing all birds on the premises. Partially tested flocks are not eligible for official recognition in Massachusetts. Five counties, Barnstable, Dukes, Franklin, Hampshire, and Plymouth, had all their flocks classified as negative at the end of the testing season.

Eighteen flocks, representing 34,105 birds, were classified as positive. The number of positive flocks and birds in those flocks was less than in the previous season.

While Massachusetts flock owners have made outstanding progress in establishing and maintaining pullorum-free flocks, there is still need for improving the industry's status in regard to freedom from pullorum disease. Annual 100 percent testing, careful selection from known pullorum-free flocks, and continual observance of effective preventive measures should enable all poultrymen to establish and maintain a pullorum-free flock.

COMPARISON OF THE 1946-47 AND 1947-48 TESTING

Table 5 shows a decrease in the number of tested flocks, but an increase in the number of tested birds. Furthermore the percentage of reactors was less in 1947-48 than in 1946-47.

Table 5. Comparison of 1946-47 and 1947-48 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1946-47 Season					
Barnstable.....	4	23,236	23,236	0.32	3
Berkshire.....	8	22,059	22,059	0.00	8
Bristol.....	81	141,888	157,719	0.35	74
Dukes.....	1	2,667	2,667	0.00	1
Essex.....	70	134,816	141,939	0.02	67
Franklin.....	26	39,373	48,193	0.13	26
Hampden.....	25	28,535	30,323	0.71	23
Hampshire.....	29	42,570	45,611	0.58	29
Middlesex.....	102	218,009	223,426	0.03	96
Norfolk.....	50	158,374	167,979	0.06	48
Plymouth.....	80	170,108	196,815	0.08	78
Suffolk.....	1	509	509	0.00	1
Worcester.....	85	174,003	178,507	0.07	80
Totals.....	562	1,156,147	1,238,983	0.13	534
1947-48 Season					
Barnstable.....	3	25,630	25,630	0.00	3
Berkshire.....	7	25,417	29,314	0.16	5
Bristol.....	75	145,764	156,440	0.14	71
Dukes.....	1	4,243	4,243	0.00	1
Essex.....	64	148,305	148,305	0.05	61
Franklin.....	20	36,924	37,945	0.002	20
Hampden.....	23	31,040	31,644	1.24	21
Hampshire.....	28	43,907	43,907	0.00	28
Middlesex.....	84	214,444	219,968	0.14	80
Norfolk.....	44	165,430	169,206	0.02	43
Plymouth.....	70	190,775	208,359	0.008	70
Worcester.....	75	188,078	197,586	0.10	73
Totals.....	494	1,219,957	1,272,547	0.10	476

TWENTY-EIGHT YEAR TESTING SUMMARY

Table 6 is a twenty-eight year testing summary, which shows continued progress in eliminating the disease from flocks. With the exception of one year (1940-41), the percentage of reactors this past year was the lowest on record for Massachusetts. The percentage (97.20) of birds in non-reacting flocks was the highest on record.

Table 6. Twenty-Eight Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non- reacting Flocks	Birds in Non- reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,460	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	660,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19
1947-48	494	1,219,957	1,272,547	0.10	476	1,185,852	97.20

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: It is realized that the demand for testing is directly related to the demand for hatching eggs and baby chicks. This may explain in part the number of flocks in the intermittent testing group. This group of flocks is not stabilized in producing hatching eggs and chicks from year to year. When not producing hatching eggs or baby chicks the flocks are not tested. Consequently a flock of this type will not be given the same attention from the standpoint of maintaining a pullorum-free standing as is given to a flock which is producing new stock annually. However, the "in and out" flocks can be safeguarded against pullorum infection through careful vigilance in keeping out pullorum and by replacing untested birds with pullorum-clean stock. In this way the flock owner will be able to qualify his flock for the pullorum-clean grade when he desires to use it for breeding purposes, provided no reactors are found when the birds are subjected to test.

During the past year 18 flocks, representing 16,788 birds, were partially tested. While the number of flocks and birds in this group may be small, it nevertheless shows that some flock owners do not fully appreciate the advantages derived from a 100 percent tested flock. It must be recognized, as has been emphasized in the past, that the true pullorum status of a flock cannot be determined by testing only part of the birds on the premises. The testing program would be more effective if all flocks were required to be 100 percent tested. It is realized that in some instances a 100 percent test might not be indicated, but at the outset every flock should be intended to be 100 percent tested. A review of data reveals that the ratio of partially tested flocks to 100 percent tested in the positive group is about 1 : 3, whereas in the negative group it is 1 : 23. It is further recognized that other factors, aside from partial testing, contribute to the pullorum status of a flock.

Early Testing: This past season poultrymen cooperated very splendidly in testing part or all of their flocks early. The following summary gives the distribution of tests by months.

Months	Number of Tests
April.....	11,938
May.....	9,990
June.....	81,461
July.....	136,606
August.....	137,587
September.....	164,935
October.....	230,326
November.....	189,330
December.....	178,308
January.....	100,791
February.....	37,586
March.....	15,640
April, 1948.....	2,613
Total.....	1,297,111

It may be noted that over a half million tests were completed before October 1 and slightly more than one million by January 1. The uniform distribution of tests throughout the months of June through January has greatly facilitated the testing work and has permitted more efficient operation.

It is hoped that during the 1948-49 season poultrymen will again cooperate in having their flocks tested when the birds are eligible to be tested. No birds should be tested unless five months of age according to the rules of the National Poultry Improvement Plan.

Flock owners should file applications early. The applications are serviced in the order that they are received, unless circumstances suggest otherwise. In order to service applications, money must be on deposit with the Treasurer of the University of Massachusetts. Flock owners should not expect short-notice testing because the laboratory is not organized, equipped, and staffed for such a manner of operation.

Massachusetts flock owners can be assured that the laboratory will render service of the highest quality possible, but such service can be given only with the fullest cooperation of the flock owner.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 139

NOVEMBER 1948

Seed Inspection

By Seed Control Service Staff

This report, the twenty-first in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1948 by authority of Chapter 94 as amended by Chapter 377 of the Acts of 1946.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The following regulations and fees have been approved by the Director of the Massachusetts Agricultural Experiment Station.

FIELD CROPS:	KIND OF SEED	PURITY ONLY	GERMINATION ONLY	PURITY AND GERMINATION
Alfalfa, Rape, Ryegrasses, Soybeans, Timothy.....		\$1.00	\$0.50	\$1.25
Cereals, Buckwheat, Sudan Grass, Vetches.....		1.25	.50	1.50
Clovers, Fescues, Reed Canary Grass.....		1.00	.50	1.50
Brome Grass, Millets.....		1.50	.50	2.00
Bentgrasses, Bluegrasses, Orchard Grass, Redtop....		2.00	.50	2.25
Redtop (Unhulled).....		2.50	.50	2.75

Mixtures: Lawn, Pasture, Mowing, etc.

Purity only.....	\$2.50
Germination only.....	.50 for each component
Purity and Germination.....	2.50 + .50 for each component

Special Mixtures: Consisting of two kinds of cereals, two kinds of clover only, or Timothy and one kind of clover

Purity only.....	\$1.25
Germination only.....	.50 each
Purity and Germination.....	2.00

Vegetables: Germination tests for all kinds of vegetable seeds, 30 cents each.

Cleaning Tobacco Seed: For each lot of one pound or less, based on the weight of seed as received for cleaning, 50 cents.

Kinds of Seed Not Listed: Fees for testing and for other seed determinations not listed will be based on the time consumed in making the test or for other service requested.

Free Tests: During any one calendar year, the Seed Testing Laboratory will allow two free tests of vegetable or tobacco seed to any person residing or doing business in the Commonwealth.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any kind to be submitted for a germination test is 400.

Samples should be taken so as to correctly represent the lot sampled, each placed in a strong container, the parcel of samples securely wrapped and addressed to **Seed Laboratory, Agricultural Experiment Station, Amherst, Mass.**

Checks or Money Orders must be made payable to the University of Massachusetts and sent to the Seed Laboratory.

In no case will the final report for work done be rendered until all fees are paid.

SEED INSPECTION FOR THE SEASON OF 1948

By Seed Control Service Staff:

F. A. McLaughlin, *Associate Research Professor in Charge*
Jessie L. Anderson, *Research Instructor*
Phyllis Russell, *Laboratory Assistant*

May J. Honnay, *Clerk*
***A. Warren Clapp**, *Inspector*

Massachusetts Vegetable Seed Standards for 1949

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>).....	60	Kale.....	75
Asparagus.....	*70	Kohlrabi.....	75
Bean, Lima.....	70	Leek.....	60
Bean, Scarlet Runner.....	75	Lettuce.....	80
Bean, Other Varieties.....	75	Muskmelon.....	75
Beet.....	65	Mustard.....	75
Broccoli.....	75	Okra.....	*50
Brussels Sprouts.....	70	Onion.....	70
Cabbage.....	75	Parsley.....	60
Cabbage, Chinese.....	75	Parsnip.....	60
Carrot.....	55	Peas.....	80
Cauliflower.....	75	Pepper.....	55
Celeriac.....	55	Pumpkin.....	75
Celery.....	55	Radish.....	75
Chard, Swiss.....	65	Rhubarb.....	60
Chicory.....	65	Rutabaga.....	75
Citron.....	65	Salsify.....	75
Collard.....	80	Sorrel.....	60
Corn, Sweet.....	75	Soybean.....	75
Cress, Garden or Curled.....	40	Spinach, Common.....	60
Cress, Water.....	35	Spinach, New Zealand.....	40
Cucumber.....	80	Squash.....	75
Dandelion.....	45	Tomato.....	75
Egg Plant.....	60	Tomato, Husk.....	50
Endive.....	70	Turnip.....	80
Fetticus (Corn Salad).....	70	Watermelon.....	70

*Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds, and the percentage of hard seed, if present, must be stated.

*Employed by the State Department of Agriculture.

1948 Official Inspection of Agricultural Seeds

From November 1, 1947, to November 1, 1948, the Seed Laboratory received 6424 samples of seed, of which 817 were collected by the State Department of Agriculture and 5607 were sent in by seedsmen, farmers, and various state institutions. An additional lot of 287 samples of flower seeds for field tests only was received from the State Commissioner of Agriculture.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 6424 samples was 326 for purity and 6747 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
248 Field Crops for Purity and Germination.....	248	248
608 Field Crops for Germination only.....	.....	608
1 Field Crop for Purity only.....	1	.....
45 Lawn Mixtures for Germination only, Germinations involving 203 ingredients.....	.....	203
54 Lawn Mixtures and other types of Mixtures for Purity; Germination involving 243 ingredients..	54	243
23 Lawn Mixtures for Purity only.....	23	.....
5267 Vegetables for Germination only.....	.....	5267
20 Tree Seeds for Germination only.....	.....	20
128 Tobacco Seeds for Germination only.....	.....	128
30 Flower Seeds for Germination only.....	.....	30
<hr/> 6424	<hr/> 326	<hr/> 6747

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested 287 samples of vegetable seeds and 287 samples of flower seeds, respectively.

The Seed Laboratory cleaned 101 lots of tobacco seed for Connecticut Valley farmers. The gross weight of the tobacco seeds was 111.50 pounds, and the net weight for the cleaned seed was 87.40 pounds.

Explanation of Tables

Tables 1 - 3 contain seeds, the sale of which is regulated by Chapter 94 as amended by Chapter 377 of the Acts of 1946: Table 1, Agricultural Seeds as defined under Section 261 B1; Table 2, Mixtures of Agricultural Seeds as defined under Section 261 B1; and Table 3, Vegetable Seeds only, under provisions of Section 261 B2 and 261 C.

All samples were taken by an inspector from the State Department of Agriculture and were tested at the Seed Laboratory according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement. Mislabeling and other irregularities are emphasized by boldface type and explained in the final column of the table or in footnotes. The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

Table 4 is a summary, by wholesalers, of the total number of samples tested, showing how many were correctly labeled and how many were mislabeled.

Table 5 is a summary of germination tests of Service samples in relation to the number and percentage found both above and below standard. It consists of a tabulation of the results for 3898 samples of 24 kinds of vegetable seeds.

Table 1.—Results of Inspection and Analyses of Field Seeds—Sections 261 BI and 261 C.

Each lot of Agricultural Seeds must be labeled to show the commonly accepted name and variety, except that for Barley, Buckwheat, Oats, Rye and Wheat, when the variety is unknown the label shall bear the statement: "Variety Unknown." The label must also show lot number or other identification; percentage, by weight, of pure seed; percentage, by weight, of inert matter; percentage, by weight, of weed seeds; percentage, by weight, of other agricultural seeds; percentage of (a) germination, exclusive of hard seeds, (b) hard seeds, if present; month and year germination test was completed; origin of Alfalfa, Red Clover and Field Corn (other than Hybrid), except if origin is unknown, it must be so stated; name and address of the person who labeled the seed, or who sells, offers or exposes such seed for sale and the names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams and 1 in 10 grams of the smaller seeds, and per pound when present in excess of 1 in 25 grams and 1 in 100 grams of the larger seeds. Secondary noxious weeds are dodder (*Cuscuta spp.*), horse nettle (*Solanum carolinense*), wild mustards (*Brassica spp.*), wild garlic and wild onion (*Allium spp.*), perennial sow thistle (*Sonchus arvensis*), corncockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*). Seed is prohibited from sale for having a false or misleading label; unless the test for germination has been completed within a nine months period or if it contains primary noxious weed seeds in excess of tolerance. Primary noxious weeds are Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and quack grass (*Agropyron repens*).

Two hundred samples of field crop seeds were analyzed in the laboratory. Results of analyses, however, are given only for samples which were mislabeled. In this table complete analysis is recorded; but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
922	Fescue	Associated Seed Growers, Inc., New Haven, Conn. Frank Howard, Inc., Pittsfield Chewings, No. 38467	L 99.60 F 97.19	.....	* .....	.....	92.00 88.00	1/1948 6/1948	*Required information not given. Purity below that stated.
S-413	Oats	Belt Seed Co., Baltimore, Md. Belchertown State School, Belchertown **No. 1594	L 98.50 F 99.10	0.25 0.28	0.75 0.25	0.50 0.37	92.00 99.00	1/1948 5/1948	**Variety required unless there is a statement "Variety Unknown".

S-329	Bentgrass	Arthur R. Cone, Buffalo, N. Y. Danvers State Hospital, Danvers Colonial, No. 40-15.....	L 98.35 F 97.97	0.17 0.48	0.38 1.45	0.10 0.10	90.00 92.00	2/1948 5/1948	Weed Seed and Inert Matter excessive.
342	Oats	Essex Co. Cooperative Farming Assoc., Topsfield **Victory Type, No. 50 x 132.....	L 98.93 F 97.91	0.03 0.04	0.19 0.02	0.85 2.03	90.00 93.00	1/1948 5/1948	**Variety required unless there is a statement "Variety Unknown." "Type" not acceptable. Purity below that stated. Other Crop Seed excessive.
S-463	Buckwheat	Walter E. Fernald State School, Waverly **Silverhull Type, No. 58 x 94.....	L 98.75 F 99.80	0.10 0.05	0.65 0.15	0.50 ...	87.00 83.00	3/1948 5/1948	**Variety required unless there is a statement "Variety Unknown." "Type" not acceptable.
S-464	Alfalfa	Grimm, No. 28 x 433..... Origin (*)	L 99.38 F 99.37	0.12 0.08	0.29 0.38	0.21 0.17	78-13 82-8	1/1948 7/1948	**Required information not given.
309	Alfalfa	General Mills, Farm Service Div., Fall River Canadian variegated, No. 28 x 418..... Origin--Canada	L 99.16 F 99.01	0.38 0.34	0.10 0.26	0.36 0.39	82-12 56-14	12/1947 7/1948	Germination below that stated.
314	Brome Grass	No. 43-19.....	L 92.30 F 88.83	0.14	5.60 11.10	1.94 0.07	90.00 89.00	12/1947 6/1948	Purity below that stated. Inert Matter excessive.
311	Redtop	No. 30-166.....	L 92.00 F 92.15	0.65 0.44	7.10 6.00	0.25 1.41	90.00 90.00	1/1948 6/1948	Other Crop Seed excessive.
312	Timothy	No. 10 x 770.....	L 99.70 F 99.60	0.13 0.22	0.06 0.09	0.11 0.09	90.00 77.00	12/1947 7/1948	14 Buckhorn Plantain per oz. 33 Buckhorn Plantain per oz. Noxious weeds declared, but found excessive.
1032	Clover	Haley's Grain Store, Palmer Alsike, No. 25-476.....	L 99.14 F 99.21	0.04 0.66	0.22	0.60 0.13	65-25 71-19	2/1948 7/1948	Germination below that stated. Weed Seed excessive.
1033	Redtop	No. 30-172.....	L 93.48 F 89.46	0.52 0.61	5.04 8.73	0.96 1.20	90.00 90.00	3/1948 6/1948	Purity below that stated. Inert Matter excessive.
S-775	Peas	Northampton State Hospital, Northampton Canada, No. 60-20.....	L 99.40 F 99.70	.... ....	0.60 0.30	.... ....	85.00 76.00	2/1948 5/1948	Germination below that stated.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
813	Millet	Northboro Hardware Co., Northboro Hungarian, No. 90 x 88.....	L 98.50 F 98.25	0.96 1.19	0.29 0.34	0.25 0.22	80.00 70.00	3/1948 7/1948	Germination below that stated.
468	Clover	Palm Grain Co., Lowell Medium Red, No. 15 x 684..... Origin—75% Ohio, 25% Ind.	L 99.35 F 99.03	0.14 0.50	0.36 0.39	0.15 0.08	78-13 70-7	12/1947 7/1948	Noxious weeds not declared, but 9 Buckhorn Plantain per oz. found. Weed Seed excessive.
469	Timothy	No. 10 x 764.....	L 99.70 F 99.55	0.13 0.12	0.06 0.04	0.11 0.29	90.00 74.00	12/1947 7/1948	14 Buckhorn Plantain per oz. 21 Buckhorn Plantain per oz. Germination below that stated.
S-209	Alfalfa	State Farm, So. Bridgewater Grimm variegated, No. 28-427, Origin—Ontario Cert....	L 99.20 F 98.13	0.02 0.06	0.05 0.02	0.75 1.79	72-21 78-10	2/1948 5/1948	Other Crop Seed excessive.
202	Sudan Grass	Sunshine Feed Store, Bridgewater No. 92-33.....	L 98.15 F 98.50	0.05 0.30	1.20 0.72	0.60 0.48	85.00 74.00	3/1948 7/1948	Germination below that stated.
205	Clover	Medium Red, No. 15 x 740, Origin—Ill. 70.37%—Mo. 22.22%—N. Y. 7.41%.....	L 99.25 F 99.57	0.25 0.23	0.20 0.06	0.30 0.14	80-10 87-1	3/1948 7/1948	Noxious weeds not declared, but 16 Buckhorn Plantain and 2 Dodder per oz. found.
693	Oats	Sunshine Feed Store, Northampton Victory, No. 50 x 182.....	L 99.00 F 98.52	0.10 0.01	0.60 0.08	0.40 1.39	90.00 95.00	3/1948 7/1948	Other Crop Seed excessive.
694	Barley	**6 Row, No. 52 x 103.....	L 98.63 F 99.08	0.02	0.33 0.14	1.04 0.76	90.00 94.00	1/1948 6/1948	**Variety required unless there is a statement "Variety Unknown". "6-Row" is not a variety.
1057	Timothy	United Cooperative Farmers' Exchange, Fitchburg No. 10-803.....	L 99.60 F 99.83	0.05	0.20 0.13	0.15 0.04	* 86.00	3/1948 6/1948	*Required information not given.

1060	Millet	Hungarian, No. 90 x 88.....	L 98.50 F 97.38	0.96 2.40	0.29 0.20	0.25 0.02	80.00 68.00	3/1948 7/1948	Purity and Germination below that stated. Weed Seed excessive.
1092	Oats	Charles M. Cox Co., Boston, Mass. W. N. Potter Co., Hadley, Variety Unknown, Lot No. (*).....	L 98.80 F 99.34	0.01 0.08	0.02 0.33	0.09 0.25	94.00 93.00	1/1948 6/1948	*Required information not given. 8 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Secondary Noxious weeds not declared, but 12 Brassica spp. and 2 Corn-cockle per lb. found. Sale prohibited.
201	Oats	Wirthmore Grain & Feed Co., Bridgewater Wirthmore Brand, Variety Unknown, Lot No. (*).....	L 98.80 F 97.85	0.10 0.02	0.20 0.31	0.90 1.82	94.00 93.00	1/1948 5/1948	*Required information not given. Purity below that stated. Other Crop Seed excessive.
716	Oats	Wirthmore Grain & Feed Co., So. Deerfield Variety Unknown, Lot No. (*).....	L 98.80 F 98.57	0.10 0.06	0.20 0.44	0.90 0.93	94.00 93.00	1/1948 5/1948	*Required information not given. 6 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Secondary Noxious weeds not declared, but 14 Brassica spp. per lb. found. Sale prohibited.
739	Bluegrass	Albert Dickinson Co., Chicago, Ill. Community Feed Store, East Longmeadow Kentucky, No. 32578. Origin—Iowa, Neb.....	L 98.50 F 97.36	0.20 0.07	1.20 2.55	0.10 0.02	80.00 87.00	2/1948 5/1948	Purity below that stated. Inert Matter excessive.
896	Clover	Doughten Seed Co., Jersey City, N. J. Hyatt Hardware Co., Lee White, No. C 450.....	L 98.00 F 98.66	0.35 1.11	0.40 0.11	1.25 0.12	75-15 87-2	1/1948 7/1948	Weed Seed excessive.
695	Oats	Eastern States Farmers' Exchange, Springfield, Mass. Eastern States Farmers' Exchange, Northampton Variety Unknown, No. 1514.....	L 98.00 F 98.80	0.10 0.06	0.50 0.22	1.40 0.92	90.00 96.00	3/1948 6/1948	30 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Sale prohibited.
1081	Corn	The Page Seed Co., Greene, N. Y. Arthur W. Baldwin & Co., West Stockbridge Golden Sweetstakes, No. 7017..... Origin—Pa.	L 98.00 F 99.90	..... .....	2.00 0.10	..... .....	85.00 62.00	1/1948 6/1948	Germination below that stated.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other		Germination %	Date of Test	Violations
						Crop %	Seed %			
The Page Seed Co., Continued										
141	Oats	Erickson Farm Supply Co., So. Acton Marvel, No. J 89347.....	L 99.82	.....	0.06	0.12	90.00	11/1947	6 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Sale prohibited.
			F 99.83	.....	0.05	0.12	97.00	5/1948	
1036	Millet	Haley's Grain Store, Palmer Hungarian, No. J6 N 47.....	L 97.70	1.80	0.50	.....	80.00	11/1947	Germination below that stated.
			F 98.19	1.55	0.26	.....	58.00	7/1948	
844	Vetch	Lawrence Bros., Falmouth Winter, No. J 17 3847.....	L 98.75	0.10	0.93	0.22	82.8	2/1948	Noxious weeds not declared, but 24 Corncockle per lb. found.	
			F 99.39	0.11	0.31	0.19	78.19	6/1948		
689	Millet	O. B. Parks Co., Westfield Hungarian, No. J6 N 47.....	L 95.11	2.32	2.30	0.27	80.00	3/1948	Germination below that stated.	
			F 98.47	1.22	0.29	0.02	62.00	6/1948		
1022	Bluegrass	Ross Bros. Co., Worcester Farmers' Cooperative Exchange, Inc., Framingham Kentucky, No. A 987, Origin—Mo.....	L 98.15	0.10	1.70	0.05	85.00	1/1948	Purity below that stated. Weed Seed and Inert Matter excessive.	
			F 96.06	0.77	3.08	0.09	86.00	6/1948		
S-319	Oats	Wm. G. Scarlett & Co., Baltimore, Md. Danvers State Hospital, Danvers Vicland, No. 10461.....	L 99.00	0.20	0.80	.....	90.00	3/1948	134 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Sale prohibited.
			F 99.25	0.11	0.50	0.14	97.00	5/1948		
1018	Redtop	Farmers' Cooperative Exchange, Inc., Framingham Lot No. (*).....	L 92.00	1.00	6.00	1.00	90.00	2/1948	*Required information not given. Weed Seed and Other Crop Seed excessive.	
			F 91.02	1.54	5.39	2.05	90.00	6/1948		
384	Redtop	C. P. Washburn Co., Middleboro Lot No. 3638..... Origin—Ill.	L 91.00	1.00	7.70	0.30	90.00	3/1948	Other Crop Seed excessive.	
			F 90.83	1.36	6.18	1.63	90.00	6/1948		
386	Millet	Hungarian, No. 3799.....	L 98.50	1.00	0.50	.....	75.00	3/1948	Germination below that stated.
			F 98.55	0.82	0.63	.....	65.00	7/1948	

412	Meadow Grass	Worcester State Hospital, Worcester Rough Stalk, No. 408..... Origin—Denmark	L 86.00 F 87.59	0.50 1.58	12.50 10.83	1.00	90.00 84.00	10/1947 5/1948	Weed Seed excessive.
174	Millet	Stanford Seed Co., Buffalo, N. Y. B. W. Brown Grain Co., Concord Japanese, No. 1109.....	L 98.90 F 98.66	1.05 1.22	0.05 0.12	.... ....	85.00 74.00	1/1948 7/1948	Germination below that stated.
179	Ryegrass	Domestic, No. 3337.....	L 99.00 F 98.39	0.51 1.04	0.31 0.55	0.18 0.02	90.00 92.00	1/1948 6/1948	Weed Seed excessive.
1072	Timothy	W. N. Potter Co., Charlemont No. 2122.....	L 99.60 F 99.74	0.10	0.20 0.15	1.10 0.11	90.00 80.00	1/1948 6/1948	Germination below that stated.
1091	Peas	W. N. Potter Co., Hadley Canada Field, No. 3091.....	L 99.00 F 99.85	.... ....	1.00 0.15	.... ....	90.00 80.00	2/1948 6/1948	Germination below that stated.
1073	Corn	W. N. Potter Co., Shelburne Falls Yellow Sweepstakes, No. 3523..... Origin—Pa.	L 99.00 F 99.90	.... ....	1.00 0.10	.... ....	* 90.00	3/1948 6/1948	*Required information not given.
683	Oats	H. K. Webster Co., Lawrence, Mass. Community Feed Stores, Easthampton No. 1 White, Variety Unknown, Lot No. (*),.....	L 99.15 F 97.75	.... 0.02	0.25 0.13	0.60 2.10	95.00 94.00	4/1948 6/1948	*Required information not given. Purity below that stated. Other Crop Seed excessive. 5 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Sale prohibited.
1048	Orchard Grass	Whitney Seed Co., Buffalo, N. Y. Essex Co. Cooperative Farming Assoc., Topsfield No. 3167.....	L 91.34 F 88.02	2.10 1.74	6.51 10.19	0.05 0.05	90.00 85.00	3/1948 6/1948	Purity below that stated. Inert Matter excessive.
1049	Buckwheat	**No. 8133.....	L 98.88 F 96.83	0.93 2.94	0.19 0.21	.... 0.02	90.00 94.00	2/1948 6/1948	**Variety required unless there is a statement "Variety Unknown." Purity below that stated. Weed Seed excessive.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
Whitney Seed Co., Continued									
Farm Bureau Assoc., Worcester									
664	Barley	**Six Row, No. 80483.....	L 96.87 F 96.48	0.34 0.12	0.85 0.14	1.94 3.26	90.00 96.00	1/1948 6/1948	**Variety required unless there is a statement "Variety Unknown." "Six row" not a variety. Other Crop Seed excessive. 6 seeds of Quack Grass per lb. found Primary Noxious weed seeds excessive. Sale prohibited. **Variety required unless there is a statement "Variety Unknown."
1017	Buckwheat	Farmers' Cooperative Exchange, Inc., Framingham **No. 8133.....	L 98.88 F 99.23	0.93 0.51	0.19 0.26	..... .....	90.00 96.00	2/1948 6/1948	**Variety required unless there is a statement "Variety Unknown."
367	Oats	Pierce Hardware Co., Taunton **No. 82653.....	L 99.25 F 98.38	0.15 0.17	0.25 0.42	0.35 1.03	90.00 94.00	1/1948 5/1948	**Variety required unless there is a statement "Variety Unknown." Purity below that stated. Other Crop Seed excessive. 80 seeds of Quack Grass per lb. found. Primary Noxious weed seeds excessive. Sale prohibited.
438	Clover	H. K. Webster Co., Lawrence Medium Red, No. 50584; Origin—Idaho.....	L 99.46 F 98.85	0.08 0.12	0.04 0.06	0.42 0.97	78-12 83-13	2/1948 7/1948	Other Crop Seed excessive.
441	Bluegrass	Kentucky, No. 3697.....	L 86.60 F 84.56	0.40 0.19	13.00 14.78	* 0.47	80.00 80.00	1/1948 5/1948	*Required information not given.
725	Clover	F. H. Woodruff & Sons, Milford, Conn. Greenfield Hardware & Plumbing Supply Co., Greenfield White, No. 300—181.....	L 98.50 F 99.66	0.70	0.80 0.05	* 0.29	* 77-21	2/1948 7/1948	*Required information not given.
S-776	Reed Canary Grass	S. D. Woodruff & Sons, Orange, Conn. Northampton State Hospital, Northampton No. 84324.....	L 99.78 F 99.67	0.05 0.05	0.11 0.23	0.06 0.15	90.00 66.00	2/1948 5/1948	Gerrination below that stated.

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found						
353	W. E. Barrett Co., Providence, R. I. W. E. Barrett Co., Brockton Capitol Lawn Mixture, No. 35849, AMS29,	L	87.27	0.35	9.92	0.18	3/1948	Inert Matter excessive.	
		F	87.27	0.19	12.36	0.18	5/1948		
	Components:								
	Redtop.....	39.56	90.00					Percentage exceeds that stated	
	Kentucky Bluegrass.....	37.40	47.20	80.00					
	Chewings Fescue.....	6.47	5.93	90.00				Percentage below that stated.	
	Colonial Bent.....	6.30	90.00						
	Agrostis spp.....	.....	95.00					
	(Redtop and Colonial Bent)								
448	Arthur R. Cone, Buffalo, N. Y. American Hardware Co., Lawrence American Mixture, Lot No. (*).....	L	89.95	0.70	5.26	*	2/1948	*Required information not given. Inert Matter excessive.	
		F	89.95	0.86	8.65	0.54	5/1948		
	Components:								
	Redtop.....	36.80	90.00					Percentage and Germination below that stated.	
	Domestic Ryegrass.....	27.44	17.80	90.00					
	Chewings Fescue.....	14.70	18.11	80.00				Percentage and Germination below that stated.	
	Kentucky Bluegrass.....	10.20	6.67	80.00					
	Colonial Bentgrass.....	4.90	90.00						
	Agrostis spp.....	.....	87.00					
	(Redtop and Colonial Bent)								
208	Sunshine Feed Store, Bridgewater Ladino Clover and Orchard Grass Mixture, Lot No. (*).....	L	89.57	0.90	6.98	1.15	1/1948	*Required information not given Inert Matter excessive.	
		F	89.57	0.67	9.36	0.40	5/1948		
	Components:								
	Orchard Grass.....	64.24	75.95	80.00				Percentage exceeds that stated. Percentage below that stated.	
	Ladino Clover.....	26.73	13.62	70-10					
970	Garfield Williamson, Inc., Jersey City, N. J. Commonwealth Lock Co., Cambridge Yankee Mixture, No. 18.....							Components not listed in order of predominance.	

971	Wonderlawn Mixture, No. 40.....									Components not listed in order of predominance. Other Crop Seed not declared, but 0.54% found.
898	Charles C. Hart Seed Co., Wethersfield, Conn. Carr Hardware Co., Pittsfield Builders Blend Mixture, No. A. 48.....									Components not listed in order of predominance. Other Crop Seed not declared, but 0.70 % found
479	Oliver Johnson Seed Co., Chicago, Ill. Decatur Hopkins Co., Boston West Parks Mixture, No. 495.....	L F	50.78	1.00 0.27	1.22 8.81	0.50 0.14	1/1948 5/1948			Components not listed in order of predominance.
480	Lincoln Park Mixture, No. LA497.....	L F	90.83	0.60 0.18	9.70 8.58	* 0.41	1/1948 5/1948			Germination below that stated. Germination below that stated. *Required information not given
481	Winner Mixture, No. LA 503.....	L F	86.95	1.00 0.28	12.60 12.48	0.50 0.29	1/1948 5/1948			Germination below that stated.
	Components:									
	Timothy.....		49.50	54.13	80.00	81.00				
	Fancy Redtop.....		13.50	15.45	90.00	89.00				
	Domestic Ryegrass.....		21.78	21.00	90.00	95.00				
	White Clover.....		0.50	0.20	75-15	51-42				
	Components:									
	Fancy Kentucky Bluegrass.....		34.00	34.26	75.00	76.00				
	Fancy Redtop.....		30.00	30.18	92.00	92.00				
	Domestic Ryegrass.....		24.75	25.33	90.00	92.00				
	White Clover.....		0.95	1.06	75-15	60-35				
	Components:									
	Domestic Ryegrass.....		34.65	30.83	90.00	95.00				
	Fancy Redtop.....		27.90	32.10	90.00	86.00				
	Timothy.....		14.85	15.63	80.00	73.00				
	Fancy Kentucky Bluegrass.....		8.00	7.76	65.00	80.00				
	White Clover.....		0.50	0.63	75-15	56-40				

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found							
968	Philadelphia Seed Co., Philadelphia, Pa. Daniel M. Murphy, Hardware, Cambridge Old English Mixture, No. 048				L F	0.50 0.35	8.62 8.08	0.25 0.21	1/1948 6/1948	Given formula less than 100%. Components not listed in order of predominance.
	Components:									
	Kentucky Bluegrass	29.00	30.04	80.00						
	Redtop	27.00	.....	90.00						
	Bent	4.80	.....	85.00						"Bent" not sufficient. Colonial Bent found.
	Chewings Fescue	4.92	4.75	90.00						
	White Clover	4.95	4.86	90.00	50-48					Germination and hard seeds not stated separately. Percentage exceeds that stated.
	Common Ryegrass	9.86	17.63	95.00	93.00					
	Agrostis spp. (Redtop and Colonial Bent)	.....	34.08	.....	90.00					
969	Splendorlawn Mixture, No. 065									Components not listed in order of predominance.
387	Wm. G. Scarlett & Co., Baltimore, Md. C. P. Washburn Co., Middleboro Greenway Lawn Mixture, No. 29954				L F	0.50 1.02	12.60 12.01	0.10 0.47	2/1948 5/1948	
	Components:									
	Kentucky Bluegrass	38.40	36.57	75.00	87.00					
	Redtop	27.00	.....	90.00						
	Domestic Ryegrass	9.90	9.97	90.00	96.00					
	Chewings Fescue	4.90	5.63	75.00	97.00					
	Bentgrass	4.70	.....	90.00	.....					"Bentgrass" not sufficient. Seaside Bent found.
	White Clover	1.95	1.90	60-30	82.12					
	Agrostis spp. (Redtop & Seaside Bent)	.....	32.43	.....	92.00					

172	Stanford Seed Co., Buffalo, N. Y. B. W. Brown Grain Co., Concord Liberty Lawn Mixture, No. 5001 C.....	L F 82.87	0.80 0.66	14.42 16.06	0.90 0.41	3/1948 4/1948	App. 20 Buckhorn Plantain per oz. 14 Buckhorn Plantain per oz.	
	Components: Redtop..... Domestic Ryegrass..... Kentucky Bluegrass..... Timothy..... White Clover.....	28.00 17.90 17.22 15.68 5.00	30.15 85.00 85.00 16.51 80.00 14.16 85.00 79.00 4.15 80.00	83.00 93.00 76.00 79.00 43-55				Germination and hard seeds not stated separately.
860	Supple Biddle Co., Philadelphia, Pa. Hyannis Lumber Co., Hyannis Biddle's Valley Green Mixture, No. 41.....	L F 84.37	0.56 0.26	14.73 14.16	0.68 1.21	1/1948 6/1948	Components not listed in order of predominance. Other Crop Seed excessive.	
	Components: Fancy Redtop..... Kentucky Bluegrass..... Domestic Ryegrass..... Timothy..... White Dutch Clover.....	34.50 10.20 19.60 16.83 2.90	36.42 85.00 12.56 80.00 19.26 90.00 13.20 90.00 2.93 98.00	82.00 86.00 95.00 72.00 94-4				Germination below that stated.
861	Biddle's Tri-worthy Lawn Mixture, No. 43.....	L F 88.86	0.45 0.48	9.95 10.28	0.50 0.38	1/1948 5/1948	Components not listed in order of predominance. Other Crop Seed excessive.	
791	Whitney Seed Co., Buffalo, N. Y. Bigelow & Dowse Co., Boston Pan American Iowa Special Mixture, No. Pa. 803.....	L F 88.86	0.45 0.48	9.95 10.28	0.50 0.38	1/1948 5/1948	Components not listed in order of predominance. Other Crop Seed excessive.	
	Components: Kentucky Bluegrass..... Redtop..... Common Ryegrass..... Wild White Clover.....	33.15 30.45 24.50 1.00	32.65 75.00 32.97 85.00 22.09 90.00 1.15 76-14	80.00 90.00 90.00 53-42				Germination below that stated.

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Concluded

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components %		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found							
793	Whitney Seed Co., Continued Bigelow & Dowse Co., Continued Excelsior Lawn Mixture, No. EX 804,.....				L 92.48 F	0.35 0.37	6.55 6.87	0.35 0.28	1/1948 6/1948	
	Components:									
	Kentucky Bluegrass.....	44.10	43.49	80.00						
	Redtop.....	42.75	43.92	90.00						
	Red Fescue.....	4.90	4.05	80.00						
	Wild White Clover.....	1.00	1.02	74-18						Germination below that stated.
				49-42						
794	F. W. Woodruff & Sons, Milford, Conn. John J. Gallagher, Quincy Gallagher's Special Mixture, No. C 28 F.....				L 85.46 F	1.50 0.19	14.50 14.28	0.07 0.07	4/1948 6/1948	Components not listed in order of predominance.
	Components:									
	Kentucky Bluegrass.....	1.50	1.34	80.00						
	Redtop.....	5.00	5.42	70.00						
	Timothy.....	48.00	52.25	70.00						
	Common Ryegrass.....	29.50	26.45	90.00						Germination below that stated.
				54.00						

Table 3.—Results of Inspection and Germination of Vegetable Seeds
Sections 261 B 2 and 261 C.

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety and the name and address of the person who labeled such seed or who sells, offers or exposes it for sale. For seeds which germinate less than the Massachusetts Standard the label must also show the percentage of germination exclusive of hard seeds, percentage of hard seeds if present, calendar month and year the test was completed and the words "Below Standard" in not less than 8 point type. Date of test shall not be over nine months old, exclusive of the month in which the test was completed. Seed may not be sold or offered for sale which has a false or misleading label.

Five hundred and eighty-two samples of vegetable seeds were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of the law.

The wholesaler's name, in all instances, and the germination for those samples of seed found below standard in germination are in boldface type. In samples for which the found germination is not in boldface, the germination is above standard but below the germination stated.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard— %
			Given		Found		
			%	Date of Test	%	Month of Test	
W. E. Barrett Co., Providence, R. I.							
W. E. Barrett Co., Brockton							
344	Cabbage	Red Dutch.....	..	.....	0	4/1948	75
347	Lettuce	Tomhannock.....	..	.....	0	4/1948	80
348F	Spinach	Savoy Bloomsdale.....	..	.....	46	4/1948	60
Joseph Breck & Sons, Boston, Mass.							
George W. Lees, Chatham							
855	Leek	London Flag.....	75	1/1948	61	6/1948	60
W. Allee Burpee Co., Philadelphia, Pa.							
Hyatt Hardware Co., Lee							
894	Onion	Red Wethersfield.....	80	2/1948	69	5/1948	70
Waite Hardware Co., Webster							
1100	Pepper	World Beater.....	Better than 70	12/1947	34	7/1948	55
Weeks Electric Store, Greenfield							
730	Leek	Broad London.....	Better than 70	12/1947	49	5/1948	60
731	Parsnip	Guernsey.....	70	12/1947	55	5/1948	60
Arthur R. Cone, Buffalo, N. Y.							
Danvers State Hospital, Danvers							
S-324	Onion	Ebenezer.....	88	1/1948	75	5/1948	70
Reformatory for Women, Fram-							
S-86	Lettuce	ingham Big Boston.....	80	1/1948	41	4/1948	80
Worcester State Hospital, Wor-							
S-70	Lettuce	cester Cos. Romaine.....	80	1/1948	68	4/1948	80
Wrentham State School, Wrentham							
S-59	Cabbage	Glory of Enkhuizen.....	85	1/1948	61	4/1948	75
Farm Bureau Assoc., Waltham							
668	Cabbage	L. I. Savoy, No. 9.....	85	1/1948	71	6/1948	75
Ferry-Morse Seed Co., Detroit, Mich.							
Hub Hardware, Inc., Arlington							
966	Lettuce	Heights Ea. Curled Simpson.....	..	.....	58	6/1948	80
Fredonia Seed Co., Fredonia, N. Y.							
C. S. Sawyer Co., Fall River							
227F	Radish	French Breakfast.....	..	.....	65	4/1948	75

Table 3.—Results of Inspection and Germination of Vegetable Seeds.—Continued.

Lab No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
273	Celery	Thomas J. Grey Co., Weymouth, Mass.					
272	Lettuce	Winter Queen.....	..	.....	42	4/1948	55
269	Onion	Iceberg.....	..	.....	68	4/1948	80
		Southport White Globe.....	..	.....	38	5/1948	70
		Joseph Harris & Co., Rochester, N. Y.					
954F	Spinach	Joseph Harris & Co., Lexington Long Standing Bloomsdale, No. 587.....	92	1948	75	6/1948	60
		Charles C. Hart Seed Co., Wethersfield, Conn.					
		Community Feed Store, East Longmeadow					
736	Squash	Mammoth Summer Crookneck, No. 1300.....	88	12/1947	75	5/1948	75
44F	Beans	Conlon & Donnelly Co., Attleboro Tendergreen, No. 1352.....	85	1/1948	71	4/1948	75
767F	Beans	Mason's Farm Market, Springfield Asgrow Black Valentine Stringless, No. 1537.....	85	1/1948	76	5/1948	75
3	Cabbage	Pierce Hardware Co., Taunton Drumhead Savoy.....	85	11/1947	75	4/1948	75
488	Cabbage	Raymond's, Inc., Boston Drumhead Savoy.....	75	1/1948	65	5/1948	75
		Budd D. Hawkins, Reading, VI.					
754	Onion	Franklin Hardware Co., Springfield Large Red Wethersfield.....	70	12/1947	36	5/1948	70
755	Onion	White Portugal or Silverskin....	70	12/1947	49	5/1948	70
		Hygrade Seed Co., Fredonia, N. Y.					
240	Cabbage	Millis Consolidated School, Millis Copenhagen Market.....	..	.....	59	4/1948	75
241	Lettuce	Iceberg.....	..	.....	67	4/1948	80
		D. Landreth Seed Co., Philadelphia, Pa.					
446	Kale	American Hardware Co., Lawrence Dwarf Green Curled Scotch, No. 602.....	85 or better	1/1948	75	5/1948	75
445	Radish	Round Black Spanish, No. 975..	85 or better	1/1948	64	5/1948	75
		The Page Seed Co., Greene, N. Y.					
815	Onion	Fred's Hardware Co., Westboro White Portugal or Silverskin....	App. 80	12/1947	71	5/1948	70
876F		Tri-Town Grain Co., Spencer French Breakfast.....	App. 85	12/1947	76	5/1948	75
300	Cucumber	Perry Seed Co., Boston, Mass. Straight 8, No. 3020.....	..	.....	62	4/1948	80
		Walter E. Fernald State School, Waverly					
S-461F	Beans	Tendergreen, No. 408.....	85	1/1948	58	5/1948	75
S-29	Celery	Summer Pascal, No. 2225.....	75	12/1947	60	4/1948	55
		Myles Standish State Hospital, Taunton					
S-355F	Beans	Tendergreen, No. 406.....	96	12/1947	88	4/1948	75
		Northampton State Hospital, Northampton					
S-780F	Beans	Tendergreen, No. 408.....	85	1/1948	55	5/1948	75
816F	Beans	Ross Bros. Co., Worcester, Mass. Tendergreen, No. 2432.....	85	1/1948	74	5/1948	75

Table 3.—Results of Inspection and Germination of Vegetable Seeds.—Concluded.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Joseph Sordillo & Sons, Boston, Mass.							
165	Asparagus	Couvers Colossal.....	..	.....	11	5/1948	*70
156	Onion	Red Flat.....	..	.....	6	4/1948	70
492	Onion	White Portugal.....	..	.....	22	5/1948	70
493	Onion	Brown Globe.....	..	.....	46	5/1948	70
166F	Radish	Long Dark.....	..	.....	54	4/1948	75
F. H. Woodruff & Sons, Milford, Conn.							
219F	Beans	D'Arruda Hardware Co., Fall River Asgrow Stringless Valentine, No. 32281.....	App. 88	1/1948	78	4 1948	75
J. H. Fairbanks & Sons, Inc., Bridgewater							
126	Parsnip	Hollow Crown, No. 32119C....	84	11/1947	60	5/1948	60
Perry Seed Co., Boston							
1101	Beans	Tendergreen, No. 2-9216.....	85	2/1948	52	7 1948	75
S. D. Woodruff & Sons, Orange, Conn.							
S-30F	Spinach	Metropolitan State Hospital, Waltham Va. Blight Resistant, No. 74353	87	11/1947	76	4/1948	60

*Including hard seeds.

Table 4.—Summary of Inspection

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Apothecaries Hall Co., Waterbury, Conn.							1	0	1
Associated Seed Growers, Inc., New Haven, Conn.	26	26	0	3	2	1	1	0	1
Aubuchon, W. E., Co., Inc., Fitchburg, Mass.	6	6	0						
Bailey, E. W., & Co., Montpelier, Vt.				1	1	0			
Barrett, W. E., Co., Providence, R. I.	10	7	3				1		1
Boston Market Gardener's Assoc., Boston, Mass.	3	3	0						
The Belt Seed Co., Syracuse, N. Y.				8	7	1			
Breck, Joseph, & Sons, Boston, Mass.	28	27	1						
Burpee, W. Atlee, Co., Philadelphia, Pa.	29	25	4						
Butler Bros., Chicago, Ill.	3	3	0						
Comstock, Ferre & Co., Wethersfield, Conn.	25	25	0				1	1	0
Cone, Arthur R., Buffalo, N. Y.	26	22	4	48	27	21	2	0	2
Cox, Charles M., Co., Boston, Mass.				3	0	3			
Craver Dickinson Co., Buffalo, N. Y.				2	2	0			
Crosman Seed Corp., Rochester, N. Y.	13	13	0						
Delta Sales Corp., Delta, Pa.				1	1	0			
Dickinson, Albert, Co., Chicago, Ill.				7	6	1			
Doughten Seed Co., Jersey City, N. J.				1	0	1	1	1	0
Eastern States Farmers' Exchange, Springfield, Mass.	16	16	0	16	15	1			
Empire Seed Co., Fredonia, N. Y.	10	10	0						
Farm Bureau Assoc., Waltham, Mass.	5	4	1						
Ferry-Morse Seed Co., Detroit, Mich.	16	15	1						
Fredonia Seed Co., Fredonia, N. Y.	10	9	1						
Garfield Williamson, Inc., Jersey City, N. J.							2	0	2
Grey, Thomas J., Co., Weymouth, Mass.	18	15	3						
Harris, Joseph, & Co., Rochester, N. Y.	10	9	1						
Hart, Charles C., Seed Co., Wethersfield, Conn.	68	63	5	3	3	0	1	0	1
Hawkins, Budd D., Reading, Vt.	11		2						
Hygrade Seed Co., Fredonia, N. Y.	8	6	2						
Johnson, J. Oliver, Seed Co., Chicago, Ill.							4	1	3
Landreth, D., Seed Co., Bristol, Pa.	14	12	2						
Lass, U. G., Livingston, Ill.				1	1	0			
Mandeville & King Co., Rochester, N. Y.	8	8	0						
Michael-Leonard Seed Co., Chicago, Ill.	3	3	0						
Northrup, King & Co., Minneapolis, Minn.	2	2	0						

Table 4.—Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
O & M Seed Co. Green Springs, Ohio				1	1	0			
Ostberg Seed Co. Chicago, Ill.				1	1	0	4	4	0
The Page Seed Co. Greene, N. Y.	16	14	2	14	9	5	1	1	0
Pedigreed Seed Co. New York, N. Y.							1	1	0
Perry Seed Co. Boston, Mass.	46	41	5	2	2	0			
Philadelphia Seed Co. Philadelphia, Pa.							2	0	2
Ralston Purina Co. St. Louis, Mo.	6	6	0	1	1	0			
Rice, J. B., Jr., Inc. Shushan, N. Y.	8	8	0						
Rice, Jerome B., Seed Co. Cambridge, N. Y.	2	2	0						
Ross Bros. Co. Worcester, Mass.	17	16	1	1	0	1	1	1	0
Rudy Patrick Seed Co. Kansas City, Mo.	2	2	0						
Scarlett, Wm. G. & Co. Baltimore, Md.				17	12	5	2	1	1
Scott, O. M., Seed Co. Marysville, Ohio							1	1	0
Sordillo, Joseph, & Sons. Boston, Mass.	16	11	5						
Stanford Seed Co. Buffalo, N. Y.				26	21	5	2	1	1
Sterling Seed Co. Minneapolis, Minn.	5	5	0						
Supple-Biddle Co. Philadelphia, Pa.							2	0	2
Vaughan's Seed Store. New York, N. Y.	2	2	0						
Webster, H. K., Co. Lawrence, Mass.				1	0	1			
Whitney Seed Co. Buffalo, N. Y.				33	26	7	3	1	2
Woodruff, F. H., & Sons. Milford, Conn.	62	59	3	1	0	1	2	1	1
Woodruff, S. D., & Sons. Orange, Conn.	32	31	1	8	7	1			
TOTALS.	582	535	47	200	145	55	35	15	20

Service Samples

Certain kinds of vegetable seeds are known to retain their ability to germinate and to produce normal seedlings much longer than other kinds. It is also known that all kinds of seeds if not stored properly may lose their power to germinate in a comparatively short time. However, there is no reliable index by which to judge in every instance how long any one kind of seed will stand up in correct storage and certainly not under the unfavorable conditions most often found in the average retail establishment. For this reason it is necessary for every seedsman to test or have tested for him the various kinds of seed which have been carried in stock from one season to another in order that carry-over seed may be offered for sale in compliance with requirements of the seed law.

In order to illustrate the effect of age, unfavorable storage, or whatever other causes contribute to the loss of vitality of seeds in the average retail establishment, the following table has been prepared. The data are drawn from germination tests made for 3898 service samples consisting of 24 kinds of vegetable seeds, all received after the 1947 sales season and assumed to represent carry-over stock. The number of samples of each kind of seed received and the number and percentage of each both above and below standard are tabulated.

As may be expected, because they are known to retain their viability for from one to two years only, parsnip with 60 percent and onion with 57.66 percent below standard have the poorest record. Cabbage, which shows 38.89 percent below standard is rated at from four to six years longevity. It may be assumed that seedsmen have placed too much dependence on longevity tables, have purchased too large a stock of this kind of seed and, without taking into consideration effect of storage, may have carried this seed for several seasons, thus accounting for the large percentage of samples found below standard.

Whatever reasons may account for the very high percentages of various kinds of seed which were found below standard, the evidence conclusively points out the necessity of testing all carry-over seed before offering it for sale the following season.

Table 5.—Service Samples

	No. Samples Received	Found Above Standard	Found Below Standard	% Above Standard	% Below Standard
Beans, Lima.....	116	74	42	63.80	36.20
Beans, Other Varieties....	816	679	137	83.21	16.79
Beets.....	197	177	20	89.85	10.15
Cabbage.....	198	121	77	61.11	38.89
Carrot.....	227	208	19	91.63	8.37
Celery.....	30	22	8	73.33	26.67
Chard, Swiss.....	77	73	4	94.80	6.20
Corn, Sweet.....	305	263	42	86.23	13.77
Cucumber.....	168	142	26	84.52	15.48
Endive.....	25	20	5	80.00	20.00
Lettuce.....	166	111	55	66.87	33.13
Muskmelon.....	53	49	4	92.45	7.55
Onion.....	111	47	64	42.34	57.66
Parsnip.....	35	14	21	40.00	60.00
Peas.....	480	372	108	77.50	22.50
Pepper.....	51	44	7	86.28	13.72
Radish.....	114	104	10	91.23	8.77
Rutabaga.....	63	58	5	92.07	7.93
Spinach, Common.....	99	71	28	71.72	28.28
Spinach, New Zealand....	37	36	1	97.30	2.70
Squash.....	258	206	52	79.85	20.15
Tomato.....	123	113	10	91.87	8.13
Turnip.....	114	95	19	83.33	16.67
Watermelon.....	35	33	2	94.29	5.71
Totals.....	3898	3132	766		
Averages.....				80.35	19.65

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted by the Department of Olericulture
W. H. Lachman, Assistant Research Professor

Clinton E. Anderson, Student Assistant

Tests have been conducted by the Experiment Station for the past thirteen years to determine the trueness to type of various kinds of vegetable seeds which are offered for sale in this State. The purpose of this work has been to discourage the distribution of unfit or worthless seed. Seed samples of rutabagas, turnips, carrots, radishes, beets, spinach, beans, and sweet corn were purchased by the State Inspector and sent here where they were planted in field test plots in order to compare plant characteristics with the labeled variety name. Growing conditions were quite satisfactory, except for spinach, for which temperatures were too high; and as a consequence results are not recorded in this report.

Yield records were not taken because of the necessity of using small plots; and replication of the plantings was not feasible on account of the large number of strains and varieties in the test. Conformity to type has been the measure of comparison in these tests, and individual plants have been called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted a typical for the particular variety under consideration.

In studying the performance records and comparing them with the results of previous years it is evident that there has been a significant improvement in the care exercised by seedsmen in producing and selling vegetable seed. In a few instances it appeared that the variety had been misnamed or misrepresented, but these have usually been reasonably good substitutions.

As in previous years, it was noted that some producers of hybrid sweet corn seed should take increasing care in detasseling their fields. Probably most other suggestions for maintaining good seed stocks should be directed to the retailers. It is well known that turnip seed do not retain their vitality over any considerable length of time, and therefore hold-over seed should be given a germination test before it is distributed to the public. A few retailers are prone to combine small lots of seed of several varieties of one kind of vegetable at the end of the growing season and "get rid" of it to the public the next year. This practice certainly should be discouraged.

The source of the seed is given together with remarks on conformity to type, except that those lots of seed which were tested in the field and found 100 percent true-to-type are not included in this table.

Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., New Haven, Conn.				
Essex Co. Cooperative Farming Assoc., Topsfield				
331 F	Beet	Asgrow Wonder.....	96	2% long top shape—2% oblong
Interurban Grocery Co., Southbridge				
795 F	Beet	Asgrow Wonder.....	94	6% oblong
Sears, Roebuck & Co., Lawrence				
449 F	Beet	Detroit Dark Red.....	94	4% spindle shape—2% long top shape
451 F	Radish	White Icicle.....	99	1% scarlet rooted
W. E. Aubuchon Co., Inc., Fitchburg, Mass.				
874 F	Radish	Early Scarlet Turnip.....	..	A very bad mixture of about 4 varieties, including White Icicle, French Breakfast, Sparkler, and Early Scarlet
W. E. Aubuchon Co., Inc., Greenfield				
727 F	Carrot	Danvers Half Long.....	..	Badly mixed with Chantenay
Joseph Breck & Sons, Boston, Mass.				
281 F	Beet	Crosby's Egyptian, No. 5272-15....	86	14% deep globe shape
Winer's Hardware Co., Quincy				
105 F	Carrot	Danvers Half Long.....	97	3% very long tapering and light colored
W. Atlee Burpee Co., Philadelphia, Pa.				
Herman Davis, Merrimac				
1009 F	Beet	Boston Crosby or Early Wonder, No. 125.....	88	10% spindle shape—2% long top shape
1010 F	Beet	Crosby's Egyptian, No. 111.....	84	10% spindle shape—6% long top shape
Schofield Hardware Co., No. Attleboro				
66 F	Carrot	Goldinhart.....	98	2% long tapering roots
Butler Bros., Cambridge, N. Y.				
Chatham 5c-\$1.00 Store, Chatham				
857 F	Beet	Early Wonder.....	94	2% mangold—4% long top shape
Comstock, Ferre & Co., Wethersfield, Conn.				
F. L. Cardoza, New Bedford				
100 F	Corn	Golden Bantam.....	..	Not Golden Bantam; a hybrid, probably Golden Cross
Foster-Farrar Co., Northampton				
787 F	Beet	Detroit Dark Red.....	98	2% long top shape
Arthur R. Cone, Buffalo, N. Y.				
Danvers State Hospital, Danvers				
S-323 F	Beet	Detroit Dark Red.....	90	4% spindle shape—6% flattened
Mass. Reformatory, West Concord				
S-152 F	Beet	Early Wonder.....	96	4% deep globe shape
Crosman Seed Corp., East Rochester, N. Y.				
S. S. Kresge Co., Pittsfield				
911 F	Beet	Crosby's Egyptian.....	88	4% long top shape—6% long spindle shape—2% obovate
Eastern States Farmers' Exchange, Inc., Springfield, Mass.				
Eastern States Farmers' Exchange, Waltham				
188 F	Beet	Perfected Detroit, No. V-15.....	96	4% long top shape
Empire Seed Co., Fredonia, N. Y.				
Frank Beanco, Lawrence				
456 F	Carrot	Tendersweet.....	96	4% green petioled type

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
		Farm Bureau Assoc., Waltham		
671 F	Beet	Crosby's Egyptian, No. 52.....	90	10% long top shape
669 F	Carrot	Morse's Bunching, No. 48.....	98	2% white roots; otherwise a very outstanding strain
		Ferry-Morse Seed Co., Detroit, Mich.		
		Cate Hardware Co., Shrewsbury		
660 F	Beet	Detroit Dark Red.....	86	10% long top shape—4% oblong
		Jordan-Marsh Co., Boston		
943 F	Radish	French Breakfast.....	96	4% globe shape roots
		Fredonia Seed Co., Fredonia, N. Y.		
		C. S. Sawyer Co., Fall River		
222 F	Beet	Early Eclipse.....	92	6% long spindle shape—2% long top shape
227 F	Radish	French Breakfast.....	88	12% globe shape roots
		Thomas J. Grey Co., Weymouth, Mass.		
262 F	Beet	Edmand's.....	92	8% long spindle shape
264 F	Radish	French Breakfast.....	94	6% globe shape roots
		Joseph Harris & Co., Rochester, N. Y.		
		Joseph Harris & Co., Lexington		
959 F	Corn	Lincoln, No. 1415.....	91	9% off-type yellow anthers
		Charles C. Hart Seed Co., Wethersfield, Conn.		
		Community Feed Store, East Longmeadow		
733 F	Radish	Early Scarlet Globe.....	92	8% roots white tipped
		Conlon & Donnelly, Attleboro		
46 F	Beet	Detroit Dark Red, No. 218.....	96	4% long top shape
45 F	Carrot	Danvers Half Long Stump Root, No. 746.....	98	2% lemon yellow color
		N. P. Hayes, New Bedford		
87 F	Beet	Early Wonder (B).....	96	4% deep globe shape
		Robert Quigly Hardware Co., No. Brookfield		
879 F	Beet	Crosby's Egyptian, No. 857.....	90	10% long top shape
880 F	Beet	Detroit Dark Red, No. 218.....	90	10% spindle shape
		Budd D. Hawkins, Reading, Vt.		
		Franklin Hardware Co., Springfield		
752 F	Beet	New Eclipse Early Blood.....	90	10% oblong roots
		Hygrade Seed Co., Fredonia, N. Y.		
		Millis Consolidated Schools, Millis		
238 F	Beet	Detroit Dark Red.....	84	12% spindle shape—4% obovate
		Mandeville & King Co., Rochester, N. Y.		
		Cosby & Yellnick Co., Springfield		
745 F	Radish	Scarlet Globe.....	97	3% white tipped
		Phillips General Store, Williamstown		
933 F	Radish	Icicle.....	96	4% scarlet rooted
		The Page Seed Co., Greene, N. Y.		
		Fullam Hardware Co., No. Brookfield		
878 F	Beet	Egyptian Blood, No. D-13-8548....	..	All roots within the type, but a very poor strain
		Tri-Town Grain Co., Spencer		
876 F	Radish	French Breakfast.....	92	8% globe shape roots
		Perry Seed Co., Boston, Mass.		
294 F	Beet	Early Wonder, No. 1135.....	88	8% long top shape—4% obovate
295 F	Radish	French Breakfast, No. 5864.....	96	4% globe shape roots
		Ralston Purina Co., St. Louis, Mo.		
		Berkshire Feed & Farmers' Supply Co., Pittsfield		
927 F	Beet	Early Wonder.....	94	Very variable plant type—4% long top shape—2% obovate

Field Tests of Vegetable Seeds—Concluded

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
J. B. Rice, Jr., Inc., Shushan, N. Y.				
883 F	Beet	Tucker Hardware Co., Warren Early Blood Turnip.....	95	3% white-fleshed roots— 2% long spindle shape
885 F	Radish	French Breakfast.....	94	6% globe shape roots
Ross Bros Co., Worcester, Mass.				
817 F	Beet	Detroit Dark Red, No. 2325.....	94	6% spindle shape
F. H. Woodruff & Sons, Milford, Conn.				
General Mills, Farm Service Div., Middleboro				
138 F	Carrot	Danvers Half Long, No. 1-97.....	98	2% lemon yellow color
General Mills, Farm Service Div., Waltham				
183 F	Corn	Hybrid Sweet Lincoln, No. 31305...	94	6% off-type yellow anthers
763 F	Beet	Mason's Farm Market, Springfield Woodruff's Early Wonder, No. 8153	86	6% oblong—8% long top shape
Robinson Hardware Co., Hudson				
807 F	Radish	French Breakfast, No. 2-739.....	97	3% globe-shape roots
Skibiski Farm Supply, Inc., South Deerfield				
712 F	Beet	Detroit Dark Red, No. 26043.....	94	2% long top shape—4% spindle shape—plant type very variable
713 F	Beet	Short Top Detroit, No. 1-818.....	94	4% flattened—2% obovate
S. D. Woodruff & Sons, Orange, Conn.				
A. Faietti, Middleboro				
131 F	Beet	Crosby's Egyptian, No. 84266.....	92	8% deep top shape

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor

Clinton E. Anderson, Student Assistant

This year marks the thirteenth season that the Department of Floriculture has cooperated with the Seed Laboratory in conducting trials to determine the quality of flower seeds offered for sale in various retail outlets. Seeds of 287 lots, representing 64 genera, packeted by 21 wholesalers or distributors were obtained from 49 retail sources by the Seed Inspector. Four retail seed stores were included in this number, the greater number of lots being obtained from chain stores and hardware stores.

The lots were distributed among the various genera as follows:

Ageratum.....	4	Dianthus.....	7	Nicotiana.....	4
Althea.....	2	Didiscus.....	1	Nigella.....	1
Alyssum.....	9	Dimorpotheca.....	2	Papaver.....	6
Amaranthus.....	1	Eschscholtzia.....	4	Petunia.....	19
Anchusa.....	2	Gaillardia.....	3	Phacelia.....	1
Antirrhinum.....	6	Geum.....	1	Phaseolus.....	1
Aster.....	1	Godetia.....	1	Phlox.....	9
Brachycome.....	2	Gomphrena.....	1	Portulaca.....	11
Calendula.....	5	Gypsophila.....	2	Pyrethrum.....	1
Calliopsis.....	2	Helianthus.....	1	Reseda.....	1
Callistephus.....	12	Helichrysum.....	2	Ricinus.....	1
Campanula.....	3	Iberis.....	7	Salvia.....	3
Celosia.....	5	Impatiens.....	3	Scabiosa.....	6
Centaurea.....	8	Ipomoea.....	12	Statice.....	2
Chrysanthemum.....	4	Kochia.....	2	Tagetes.....	20
Clarkia.....	1	Linaria.....	2	Tithonia.....	1
Cleome.....	4	Lupinus.....	2	Tropaeolum.....	9
Convolvulus.....	2	Malcomia.....	1	Verbena.....	9
Cosmos.....	10	Mathiola.....	2	Vinca.....	2
Cynoglossum.....	2	Mirabilis.....	2	Zinnia.....	22
Dahlia.....	4	Nemesia.....	1		
Delphinium.....	9	Nemophila.....	1		
				TOTAL.....	287

Seed sowing was started on June 26 but it was not completed until July 2 because of weather conditions. In many cases it was necessary to sow the entire contents of the packet because of the small number of seeds.

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, with only one-third or less of the plants not true to form or color; "fair" between one-third and two-thirds not true; "and not satisfactory" if less than one-third was true to name or if the lot did not produce sufficient plants for providing satisfactory data.

As far as possible trueness to type was determined. Since many lots were described as mixtures or did not carry varietal names, a wide range in color and form was permissible.

A larger percentage of the lots than normal gave poor results on germination. This condition was doubtless due in part to two factors, the late date on which the seeds were sown and the small amount of rains during the month of July as shown by the official weather records.

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Joseph Breck & Sons, Boston, Mass.				
415 F	Ageratum	Blue Ball Improved.....	Poor	Not satisfactory
414 F	Alyssum	Violet Queen 0121.....	Poor	Not satisfactory
418 F	Antirrhinum	Large Flowered Giant, Choice Mixture 0228.....	Poor	Not satisfactory
417 F	Callistephus	Giants of California-Deep Rose 0597.....	Poor	Not satisfactory
16 F	Callistephus	Navy Blue Early Giant Crego 0564.....	Fair	Incomplete
419 F	Centaurea	Americana Rosy Lilac 1232.....	Fair	Satisfactory
422 F	Cleome	Pungens Spider Plant White Feather 1042.....	Poor	Not satisfactory; 2 plants
423 F	Convolvulus	Minor Royal Ensign 1428.....	Fair	Satisfactory
421 F	Cosmos	Semi Double Orange Ruffle.....	Fair	Satisfactory
420 F	Cosmos	Sensation Pink.....	Fair	Satisfactory
435 F	Cynoglossum	Firmament 1540.....	Good	Satisfactory
431 F	Delphinium	Chinese Blue Mirror-Giant Larkspur.....	Poor	Not satisfactory; 6 plants
424 F	Dianthus	Breck's Geisha Girl 1664.....	Fair	Satisfactory; 9 colors
427 F	Nicotiana	Crimson Bedder Flowering Tobacco 2796.....	Fair	Satisfactory
428 F	Petunia	Ruffled Little Giants Mixed 2934	Poor	Not satisfactory; 2 plants
429 F	Petunia	Celestial Rose Improved 2990.....	Poor	Not satisfactory
430 F	Petunia	Snow Queen Dwari Bedding 3012	Poor	Not satisfactory
425 F	Tagetes	Mayling Carnation Flower 2570	Fair	Incomplete; had not flowered Sept. 18
426 F	Tagetes	Sunkist Double French 2607.....	Good	Satisfactory
432 F	Tropaeolum	Canariense Canary Bird Fine 3998.....	Fair	Incomplete; had not flowered Sept. 18
437 F	Zinnia	California Giant Purity 4289.....	Good	Satisfactory
436 F	Zinnia	Dahlia Flowered Canary Bird 4306.....	Good	Satisfactory
434 F	Zinnia	Fantasy Rosalie.....	Good	Satisfactory
433 F	Zinnia	Dwarf Defiance Salmon Rose 4380.....	Good	Satisfactory
East Bridgewater Hardware Co., East Bridgewater				
371 F	Chrysanthemum	Single Mixed.....	Fair	Incomplete; had not flowered Sept. 18
372 F	Salvia	Blaze of Fire.....	Poor	Not satisfactory
Oliver's Hardware & Supply Co., Stoughton				
233 F	Dianthus	Double Mixed.....	Poor	Not satisfactory
W. Atlee Burpee Co., Philadelphia, Pa.				
Brad's Hardware Co., Maynard				
513 F	Eschscholtzia	California Poppy, Monarch Mixed.....	Fair	Satisfactory
517 F	Impatiens	Balsam Double Camelia Flowered Mixed.....	Good	Satisfactory; 5 colors
518 F	Petunia	Hybrida Mixed.....	Poor	Not satisfactory
516 F	Tagetes	Marigold Tall African Double Mixed.....	Good	Incomplete; had not flowered Sept. 17
515 F	Verbena	Giant Mixed.....	Fair	Satisfactory; 5 colors
514 F	Zinnia	Giant Dahlia Flowered Mixed.....	Good	Satisfactory; 14 colors
Crosman Seed Corp., East Rochester, N. Y.				
S. S. Kresge Co., Lawrence				
643 F	Amaranthus	Molten Fire.....	Good	Satisfactory
642 F	Callistephus	Aster Giant Crego New Wilt Resistant Mixed.....	Poor	Not satisfactory
635 F	Celosia	Cockscomb Velosia Cristata Double Dwarf Mixed.....	Good	Satisfactory; 6 colors
636 F	Chrysanthemum	Annual Mixed Colors.....	Fair	Incomplete; had not flowered Sept. 17
640 F	Clarkia	Elegans Mixed Colors.....	Poor	Not satisfactory
639 F	Delphinium	Larkspur-Giant Imperial Carmine King.....	Poor	Not satisfactory
644 F	Delphinium	Larkspur-Blue Spire.....	Poor	Not satisfactory; 4 plants
634 F	Eschscholtzia	California Poppy-Mixed.....	Good	Satisfactory; 3 colors
638 F	Petunia	Black Prince Velvety Deep Red	Poor	Not satisfactory; 1 plant
641 F	Phlox	Drummond Mixed Colors.....	Poor	Not satisfactory
637 F	Tagetes	Tall African Mixed Colors.....	Good	Incomplete; only one plant in flower Sept. 17

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Westwood Hardware & Supply Co., Westwood				
252 F	Portulaca	Double Mixed.....	Poor	Not satisfactory
251 F	Zinnia	Giant Double Crimson.....	Good	Satisfactory
Fredonia Seed Co., Fredonia, N. Y.				
Johnson Bros., Gleasondale				
568 F	Callistephus	Tall Branching Mixed.....	Poor	Not satisfactory
566 F	Centaurea	Cyanus Double Mixed.....	Good	Satisfactory; 10 colors
569 F	Convolvulus	Major Mixed.....	Good	Satisfactory; 2 colors
567 F	Portulaca	Grandiflora Single Mixed.....	Poor	Not satisfactory
Nevitte Hardware Co., Taunton				
361 F	Cosmos	Early Mammoth Single Mixed.....	Good	Satisfactory; 3 colors
362 F	Delphinium	Larkspur Giant Improved Mixed.....	None	
364 F	Ipomoea	Heavenly Blue.....	Good	Satisfactory
365 F	Petunia	Blue Bee.....	Poor	Not satisfactory
363 F	Tagetes	Dwarf Double Mixed.....	Good	Satisfactory; 6 colors
Thomas J. Grey Co., Weymouth				
869 F	Anchusa	Blue Bird.....	Fair	Satisfactory
868 F	Calliopsis	Dwarf Goblin.....	Fair	Satisfactory
863 F	Callistephus	Beauty Rose Pink.....	None	
865 F	Cleome	Giant Pink Queen.....	Poor	Not satisfactory
864 F	Cosmos	Radiance.....	Fair	Satisfactory
866 F	Nicotiana	Affinis White.....	Good	Satisfactory
867 F	Petunia	Theodosia.....	None	
870 F	Portulaca	Single Jewel.....	Good	Satisfactory; 7 colors
871 F	Scabiosa	Improved Large Flowering Cherry Red.....	Fair	Incomplete; had not flowered Sept. 17
872 F	Zinnia	Tom Thumb Mixed.....	Good	Satisfactory; 13 colors
Joseph Harris & Co., Rochester, N. Y.				
Joseph Harris & Co., Lexington				
964 F	Ipomoea	Giant Flowered Heavenly Blue.....	Good	Satisfactory
963 F	Mirabilis	Four O'Clocks mixed colors.....	Good	Satisfactory; 6 colors
Chas. C. Hart Seed Co., Wethersfield, Conn.				
H. Bruckman Co., Lawrence				
632 F	Eschscholtzia	California Poppy Mixed.....	Good	Satisfactory; 3 colors
631 F	Scabiosa	Mourning Bride Mixed.....	None	
630 F	Tropaeolum	Dwarf Mixed.....	Fair	Satisfactory; 7 colors
633 F	Zinnia	Lilliput Finest Mixed Dwarf.....	Good	Satisfactory; 14 colors
Conant Littleton Co., Littleton				
Common				
610 F	Calendula	Orange King.....	Fair	Satisfactory
607 F	Gaillardia	Blanket Flower Mixed Colors.....	Poor	Not satisfactory
611 F	Helichrysum	Everlasting Mixed.....	Fair	Incomplete; had not flowered Sept. 17
606 F	Ipomoea	Pearly Gates.....	Good	Satisfactory
605 F	Petunia	Hybrida Mixed.....	Poor	Not satisfactory
608 F	Portulaca	Single Mixed.....	Good	Satisfactory; 7 colors
609 F	Tropaeolum	Double Sweet Scented Glorious Gleam Hybrids Mixed.....	Fair	Satisfactory; 9 colors
Raymond's, Inc., Boston				
485 F	Celosia	Plumosa Tall Mixed.....	Good	Satisfactory; 8 colors
486 F	Gypsophila	Baby's Breath White.....	Good	Satisfactory
483 F	Iberis	Dwarf Hybrids Finest Mixed.....	Poor	Not satisfactory
484 F	Nicotiana	Affinis Hybrids Very Fragrant.....	Good	Satisfactory; 4 colors
487 F	Portulaca	Single Mixed Colors.....	Good	Satisfactory; 10 colors
Rockland Hardware Co., Rockland				
258 F	Impatiens	Choice Double Mixed.....	Good	Satisfactory; 8 colors
256 F	Mathiola	Finest Mixed Dwarf 10 Weeks.....	Poor	Not satisfactory
257 F	Papaver	Shirley Mixed Colors.....	Poor	Not satisfactory
Spear Hardware, Inc., Canton				
235 F	Petunia	Balcony Rose.....	Poor	Not satisfactory
234 F	Reseda	Giant Machet Type.....	Fair	Satisfactory
Sunshine Stores, Inc., Ayer				
613 F	Alyssum	Little Gem.....	Fair	Satisfactory
614 F	Iberis	Dwarf Hybrids Finest Mixed.....	Poor	Not satisfactory
612 F	Lupinus	Hartwegii Mixed.....	Fair	Satisfactory; 3 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Chas. C. Hart Seed Co., Continued				
992 F	Callistephus	S. S. Kresge Co., Newburyport	Poor	Not satisfactory
1002 F	Chrysanthemum	Giant Crego Deep Purple.....	Fair	Incomplete; had not flowered Sept. 17
994 F	Didiscus	Annual Mixed.....	Poor	Not satisfactory; 1 plant
1000 F	Papaver (nudicaula)	Blue Lace Flower—Queen Anne's		
996 F	Petunia	Iceland Poppy Mixed Colors...	Poor	Not satisfactory
999 F	Petunia	Celestial Rose.....	Fair	Satisfactory
995 F	Phlox	General Dodds.....	Fair	Satisfactory
1003 F	Scabiosa	Drummond's Mixed Colors.....	Poor	Not satisfactory
997 F	Tagetes	Blue Moon.....	Poor	Not satisfactory; 1 plant
998 F	Tagetes	Royal Scot.....	Good	Incomplete; had not flowered Sept. 17
1001 F	Tagetes	Guinea Gold.....	Good	Incomplete; had not flowered Sept. 17
993 F	Tithonia	Yellow Pigmy.....	Good	Satisfactory
1005 F (A)	Verbena	Fireball.....	Poor	Not satisfactory; 6 plants
1005 F (B)	Verbena	Giant Scarlet.....	Poor	Not satisfactory
1005 F (C)	Verbena	Rose Queen.....	Fair	Satisfactory
		Giant Blue Sentinel.....	Poor	Not satisfactory
J. H. Tepper Co., Lawrence Center.				
653 F	Aster	Tahoka Daisy Lilac Blue Yellow	Poor	Not satisfactory; 1 plant
655 F	Campanula	Center.....	None	
656 F	Celosia	Canterbury Bell Mixed Colors		
651 F	Helianthus	Thomson's Magnifica Giant	Good	Satisfactory
652 F	Iberis	Plumed Mixed.....	Good	Satisfactory
654 F	Papaver	Sunflower Imported Strain.....	Poor	Not satisfactory
		Candytuft Umbellata Mixed	Poor	Not satisfactory; 1 plant
		Colors.....		
		Iceland Poppy Mixed Colors...		
Deerington Zinnia Gardens, Bargserville, Ind.				
376 F	Zinnia	F. W. Woolworth Co., Middleboro	Good	Satisfactory; 9 colors
377 F	Zinnia	Double Bloom Mixed Colors...	Fair	Satisfactory
		Red.....		
Ferry-Morse Seed Co., Detroit, Mich.				
589 F	Cosmos	Concord Hardware Co., Concord	Good	Satisfactory; 3 colors
593 F	Cleome	Ea. Mammoth Mixed.....	Good	Satisfactory
591 F	Papaver	Giant Pink Queen Spider	Fair	Satisfactory
592 F	Petunia	Flower.....	Fair	Satisfactory
590 F	Tropaeolum	Dougle Shirley Sweet Briar...	Fair	Satisfactory; 6 colors
595 F	Verbena	Large Flowered Mixed.....	Good	Satisfactory
594 F	Zinnia	Golden Gleam.....	Poor	Not satisfactory
		Fine Mixed.....	Good	Satisfactory; 10 colors
		Giant Double Dahlia Flowered		
		Mixed.....		
Dewey's Market, Inc., Acton				
601 F	Callistephus	Giant Crego Mixed Wilt	Poor	Not satisfactory
603 F	Centaurea	Resistant.....	Good	Satisfactory; 8 colors
604 F	Gypsophila	Bachelor Button—Double Mixed	Good	Satisfactory
		Covent Garden.....		
J. J. Newberry Co., Bridgewater				
396 F	Dianthus	Double Carnation Shades.....	Poor	Not satisfactory
392 F	Ipomoea	Heavenly Blue.....	Poor	Not satisfactory
393 F	Ipomoea	Crimson Rambler.....	Good	Satisfactory
395 F	Sa v a	Bonfire.....	Poor	Not satisfactory
394 F	Verbena	Scarlet Defiance.....	Poor	Not satisfactory; 2 plants
J. J. Newberry Co., Maynard				
521 F	Alyssum	Carpet of Snow Sweet.....	Fair	Satisfactory
523 F	Centaurea	Bachelor Button—Double Blue	Good	Satisfactory
520 F	Delphinium	Pacific Hybrids, Perennial.....	None	
524 F	Linaria	Fairy Bouquet Mixed.....	Good	Satisfactory; 9 colors
522 F	Malcomia	Virginia Stock Mixed.....	Good	Satisfactory; 6 colors
519 F	Phlox	Annual Choice Mixed.....	None	
A. G. Pollard Co., Lowell				
531 F	Antirrhinum	Giant Bedding Rust Resistant	Fair	Satisfactory; 4 colors
529 F	Dahlia	Mixed.....	Poor	Not satisfactory
530 F	Dimorphotheca	Unwins Dwarf Hybrid.....	Fair	Satisfactory; 3 colors
528 F	Gaillardia	African Daisy Hybrids.....	Fair	Incomplete; had not flowered Sept. 17
532 F	Ipomoea	Picta Single Mixed.....	Fair	Incomplete; had not flowered Sept. 17
533 F	Tagetes	Moon Flower Grandiflora Alba	Fair	Satisfactory
		Crown of Gold.....		

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected and Variety of Seed	Field Tests	
			Germination	Performance
Budd D. Hawkins, Reading, Vt.				
581 F	Tropaeolum	Red & White Store, West Concord Golden Gleam Double Sweet Scented.....	Good	Satisfactory
582 F	Tropaeolum	Dwarf Mixed Colors.....	Good	Satisfactory; 8 colors
Hygrade Seed Co., Fredonia, N. Y.				
245 F	Calendula	Millis Consolidated School, Millis Exquisite Mixed Colors.....	Poor	Not satisfactory
246 F	Tagetes	Orbit.....	Good	Incomplete; had not flowered Sept. 17
247 F	Zinnia	California Giants Mixed.....	Good	Satisfactory; 12 colors
Mandeville & King Co., Rochester, N. Y.				
H. Bruckman Co., Lawrence				
624 F	Ageratum	Lavender Blue.....	Poor	Not satisfactory
628 F	Antirrhinum	Red Fire Giants.....	Poor	Not satisfactory; 2 plants
627 F	Dahlia	Newer Types—Dwarf All Colors	Poor	Not satisfactory
625 F	Dianthus	Pinks Gaiety All Colors.....	Poor	Not satisfactory
629 F	Nigella	Love-in-the-Mist.....	Poor	Not satisfactory
626 F	Phaseolus	Scarlet Runner Bean.....	Fair	Satisfactory
C. & D Hardware Co., Rockland				
254 F	Alyssum	Sweet Violet Queen.....	Good	Satisfactory
255 F	Zinnia	Fantasy Melody Lavender.....	Good	Satisfactory
C. D. Damon, Ayer				
623 F	Cynoglossum	For-Get-Me-Not, Chinese Firmament.....	Poor	Not satisfactory
622 F	Impatiens	Camelia Flowered All Colors...	Good	Satisfactory; 5 colors
Globe Hardware Co., Fall River				
221 F	Zinnia	Crown of Gold Pastel Tints....	Good	Satisfactory; 7 colors
Home Products Store, West Concord				
577 F	Alyssum	Snow Cloth.....	None	
579 F	Delphinium	Hardy Larkspur Shades of Blue	None	
576 F	Phlox	Drummond All Colors.....	Poor	Not satisfactory
578 F	Tagetes	American Beauty Orange and Yellow.....	Good	Incomplete; had not flowered Sept. 17
580 F	Zinnia	Giant Special Mandeville Mixed	Good	Satisfactory; 10 colors
Parker Hardware Co., Maynard				
570 F	Alyssum	Violet Queen Sweet.....	Good	Satisfactory
573 F	Dianthus	Sweet William Barbatus All Colors.....	Poor	Not satisfactory
575 F	Dimorphotheca	African Daisy All Colors.....	Fair	Satisfactory; 3 colors
572 F	Mirabilis	Four O'Clocks All Colors.....	Good	Satisfactory; 4 colors
574 F	Statice	Latifolia All Colors.....	Fair	Incomplete; had not flowered Sept. 17
571 F	Zinnia	Black Ruby Lilliput.....	Good	Satisfactory
Robinson Hardware Co., Hudson				
559 F	Antirrhinum	Rust Proof All Colors.....	Poor	Not satisfactory
561 F	Callistephus	Wilt Resistant Giant Comet All Colors.....	Poor	Not satisfactory
555 F	Chrysanthemum	White & Yellow—Perennial Shasta Daisy.....	Poor	Not satisfactory
557 F	Cleome	Pink Queen.....	Fair	Satisfactory
558 F	Delphinium	Sky Blue Annual.....	Poor	Not satisfactory
556 F	Phacelia	Bluebells of California Gentian Blue.....	Good	Satisfactory
554 F	Ricinus	Castor Bean Mixed Varieties..	Good	Satisfactory
560 F	Tagetes	Melody French Dwarf Orange..	Good	Satisfactory
Vanderhoof Hardware Co., Concord				
599 F	Campanula	Canterbury Bells Colors Mixed	Poor	Not satisfactory; 3 plants
598 F	Kochia	Burning Bush Summer Cypress	Good	Satisfactory
597 F	Nicotiana	Tobacco Flowering All Shades.	Poor	Not satisfactory
600 F	Statice	Sea Lavender All Colors.....	Poor	Not satisfactory; 4 plants
596 F	Zinnia	Mexican All Shades.....	Fair	Satisfactory; 11 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Northrup, King & Co., Minneapolis, Minn.				
617 F	Althea	W. E. Aubuchon Co., Inc., Ayer Indian Spring Hollyhocks.....	Poor	Not satisfactory
620 F	Ipomoea	Moon Flower White Seeded Noctiflora.....	Poor	Not satisfactory
616 F	Linaria	Marocanna Hybrida Excelsior Mixed.....	Good	Satisfactory; 6 colors
618 F	Nemesia	Triumph Hybrids, Mixed.....	Good	Not satisfactory; not true (Brachycome)
615 F	Portulaca	Single Mixed.....	Good	Satisfactory; 11 colors
619 F	Pyrethrum	Painted Daisy Giant Hybrids Mixed.....	Fair	Incomplete; had not flowered Sept. 17
621 F	Vinca	Periwinkle Mixed Colors.....	Poor	Not satisfactory
W. E. Aubuchon Co., Inc., Maynard				
510 F	Cosmos	Sensation Mixed.....	Fair	Satisfactory; 3 colors
509 F	Cosmos	Early Large Flowering Mixed..	Good	Satisfactory; 3 colors
507 F	Dahlia	Unwins Dwarf Hybrids Mixed..	None	
508 F	Godetia	Tall Double Mixed Satin Flower	Poor	Not satisfactory
512 F	Iberis	Candytuft Hyacinth Flowered White.....	Fair	Satisfactory
511 F	Kochia	Childsii Mexican Fire Bush	Good	Satisfactory
F. W. Woolworth Co., Hudson				
550 F	Anchusa	Bluebird.....	Fair	Satisfactory
553 F	Centaurea	Sweet Sultan Imperialis Mixed	Poor	Not satisfactory
552 F	Gomphrena	Everlasting Globe Amaranth Mixed.....	Fair	Satisfactory; 2 colors
551 F	Nemophila	Blue.....	Poor	Not satisfactory
F. W. Woolworth Co., Lowell				
542 F	Alyssum	Violet Queen.....	Good	Satisfactory
540 F	Brachycome	Swan River Daisy.....	Poor	Not satisfactory
541 F	Campanula	Calycanthemum Cup & Saucer— Canterbury Bells.....	Poor	Not satisfactory; 2 plants
543 F	Geum	Red Mrs. Bradshaw.....	None	
539 F	Papaver	Iceland Poppy Mixed.....	Poor	Not satisfactory; 3 plants
538 F	Portulaca	Single Mixed.....	Good	Satisfactory; 12 colors
F. W. Woolworth Co., Middleboro				
379 F	Dianthus	Double Mixed.....	Poor	Not satisfactory
380 F	Petunia	Hybrid Violaacea or Velvet Blue	Fair	Satisfactory
378 F	Phlox	Drummondii Mixed Colors.....	Poor	Not satisfactory
The Page Seed Co., Greene, N. Y.				
West Concord Fruit Store, West Concord				
586 F	Calliopsis	Mixed Colors.....	Good	Satisfactory; 6 colors
587 F	Callistephus	Pink Comet.....	Good	Incomplete; had not flowered Sept. 17
584 F	Gaillardia	Blanket Flower Single Mixed..	Poor	Not satisfactory
583 F	Ipomoea	Scarlet O'Hara.....	Poor	Not satisfactory
588 F	Tagetes	Tall African Mixed Colors.....	Good	Incomplete; had not flowered Sept. 17
Perry Seed Co., Boston, Mass.				
398 F	Calendula	Lemon Queen.....	Fair	Satisfactory
397 F	Callistephus	Imp. Giants of California Light Blue.....	Poor	Not satisfactory
400 F	Centaurea	Cyanus Double Blue Boy 1970.	Good	Satisfactory
401 F	Cosmos	Sensation Radiance 2270.....	Fair	Satisfactory
402 F	Delphinium	Super Majestic Deep Salmon Pink.....	Poor	Not satisfactory
399 F	Iberis	Perry's Giant White Perfection	Fair	Satisfactory
405 F	Phlox	Drummondii Grandiflora Bright Scarlet 5445.....	Poor	Not satisfactory
403 F	Tagetes	Dwarf Single French Red Head	Good	Satisfactory
404 F	Tagetes	Carnation Flowered Yellow Supreme 4080.....	Good	Satisfactory
406 F	Verbena	Giant Flowered Giant Salmon Pink.....	Poor	Not satisfactory
407 F	Zinnia	Luther Burbank 8680.....	Good	Satisfactory; 8 colors
Jerome B. Rice Seed Co., Cambridge, N. Y.				
Globe Hardware Co., Fall River				
220 F	Ipomoea	Heavenly Blue.....	Good	Satisfactory
Oliver's Hardware & Supply Co., Stoughton				
232 F	Centaurea	Double Blue.....	Good	Satisfactory; 6 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Jerome B. Rice Seed Co., Continued				
The Town Shop, West Action				
525 F	Petunia	Hybrid Mixed.....	Poor	Not satisfactory
526 F	Tagetes	Harmony.....	Good	Satisfactory
527 F	Tropaeolum	Gleam Hybrid.....	Good	Satisfactory; 7 colors
Wood Square Hardware, Inc., Hudson				
565 F	Antirrhinum	Fine Mixed.....	Poor	Not satisfactory
563 F	Petunia	Hybrid Mixed.....	Poor	Not satisfactory
562 F	Portulaca	Single Mixed.....	Good	Satisfactory; 10 colors
564 F	Tagetes	Harmony.....	Good	Satisfactory
Ross Bros. Co., Worcester				
828 F	Ageratum	Blue Perfection.....	Fair	Satisfactory
829 F	Alyssum	Violet Queen.....	Good	Satisfactory; best strain in the trials
832 F	Centaurea	Cyanus Double Blue Boy.....	Good	Satisfactory
833 F	Cosmos	Sensation Pinkie.....	Fair	Satisfactory
834 F	Delphinium	Giant Imperial Miss Cal.....	Fair	Incomplete; had not flowered Sept. 17
830 F	Iberis	Giant Hyacinth Flowered.....	Fair	Satisfactory
835 F	Ipomoea	Heavenly Blue.....	Fair	Satisfactory
837 F	Petunia	English Violet.....	Fair	Satisfactory
831 F	Scabiosa	New Blue.....	None	
836 F	Tagetes	Dwarf Double Spry.....	Good	Satisfactory
Scars, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Cambridge				
976 F	Dahlia	Unwins Dwarf Mixed 4420....	None	
975 F	Helichrysum	Strawflower Mixed 4562.....	Poor	Not satisfactory
972 F	Papaver	Shirley Mixed Colors 4524....	Fair	Satisfactory; 12 colors
980 F	Petunia	Rose of Heaven 4511.....	Poor	Not satisfactory
978 F	Phlox	Annual Mixed 4516.....	Poor	Not satisfactory
973 F	Portulaca	Brilliant Mixed 4526.....	Fair	Satisfactory; 5 colors
979 F	Salvia	Bonfire 4536.....	Poor	Not satisfactory
974 F	Verbena	Scarlet 4598.....	Poor	Not satisfactory
977 F	Vinca	Mixed Periwinkle 4604.....	Poor	Not satisfactory
981 F	Zinnia	Crimson Monarch 4616.....	Good	Satisfactory
Sterling Seed Co., Minneapolis, Minn.				
W. T. Grant Co., Lawrence				
645 F	Brachycome	Swan River Daisy.....	Poor	Not satisfactory
648 F	Celosia	Cristata Red Shades Cockscomb	Good	Satisfactory
649 F	Ipomoea	Crimson Rambler.....	Good	Satisfactory
646 F	Lupinus	Blue Bonnet.....	Poor	Not satisfactory
650 F	Mathiola	Double Dwarf Ten Weeks.....	Poor	Not satisfactory
647 F	Petunia	General Dodds Hybrid Red...	Poor	Not satisfactory
H. L. Greene Co., Inc., Lowell				
546 F	Antirrhinum	Grandiflora Rust Resistant Mixed.....	Poor	Not satisfactory
548 F	Cosmos	Sensation Giant Dazzler.....	Good	Satisfactory
544 F	Petunia	Hybrid Red General Dodds...	Good	Satisfactory
545 F	Phlox	Drummond Mixed Colors.....	Poor	Not satisfactory
547 F	Tropaeolum	Scarlet Gleam Semi Double...	Good	Satisfactory
549 F	Zinnia	California Giant Double Scarlet Cardinal.....	Good	Satisfactory
Vaughan's Seed Store, New York, N. Y.				
Tree-land, Inc., Cambridge				
986 F	Alyssum	Vaughan's Little Gem.....	Good	Satisfactory
984 F	Calendula	Orange Shaggy.....	Fair	Satisfactory
989 F	Callistephus	Giant Branching Mixed.....	Poor	Not satisfactory
983 F	Eschscholtzia	California Poppy Vaughan's Special Mixture.....	Fair	Satisfactory; 4 colors
988 F	Portulaca	Double Best Mixed.....	Poor	Not satisfactory
987 F	Scabiosa	Blue Moon Double.....	Fair	Incomplete; had not flowered Sept. 17
985 F	Tagetes	Crown of Gold.....	Good	Satisfactory
990 F	Tagetes	Vaughan's Dwarf Special Mixed	Good	Satisfactory; 6 colors
982 F	Verbena	Mammoth Mixed.....	Poor	Not satisfactory
991 F	Zinnia	Giant Dahlia Flowered Exquisite	Good	Satisfactory

Flower Seed Inspection—Concluded

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
S. D. Woodruff & Sons, Orange, Conn.				
		Pires Hardware Co., Fall River		
212 F	Iberis	Umbellata—choice mixed.....	None	
214 F	Phlox	Nana Compacta Dwarf Choice Mixed.....	None	
213 F	Scabiosa	Tall Double Flowering.....	Fair	Incomplete; had not flowered Sept. 17
Thompson Hardware Co., Lowell				
534 F	Ageratum	Blue Perfection.....	Poor	Not satisfactory
535 F	Althea	Indian Spring Annual Hollyhock	Poor	Not satisfactory
536 F	Celosia	Crested Dwarf Mixed Colors...	Good	Not satisfactory; all red
537 F	Dianthus	Annual Single Mixed Colors...	Good	Satisfactory; 9 colors
Willow Hardware Co., Arlington				
506 F	Calendula	Double Flowering Finest Mixed	Good	Satisfactory; 8 colors
503 F	Callistephus	All Colors.....	Fair	Incomplete; had not flowered Sept. 17
505 F	Ipomoea	Heavenly Blue.....	Poor	Not satisfactory
502 F	Portulaca	Double Flowering All Colors...	Fair	Satisfactory; 7 colors
504 F	Tropaeolum	Dwarf Mixed.....	Good	Satisfactory; 5 colors
501 F	Zinnia	Improved Lilliput Finest Mixed	Good	Satisfactory; 13 colors

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 140

JUNE 1949

**Inspection of Commercial
Feedstuffs**

By Feed Control Service Staff

This is the fifty-fifth report on feeding stuffs inspection. Included are data on the vitamin D content of fish liver oils, the carotene and riboflavin content of alfalfa meals, and the quality of ground oats, as well as other information of interest to those concerned with the production, distribution or use of feeds.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Assistant Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
W. Noel Jameson, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

This bulletin presents analytical data on official feed samples received at this laboratory during the 1948-1949 season. These data show that conformity to guaranteed analysis was better than it has been for some years.

For the first time since 1941 results of vitamin D assays on a number of fish liver oils and dry poultry vitamin D supplements are reported. It is planned to continue and expand this work as a regular part of the Feed Control Service.

Collaborative work is being done on methods for the determination of iodine, cobalt, copper, and vitamin A in mixed feeds. It is hoped, particularly, that workable method for vitamin A determination in mixed feeds can be adapted to routine control work. There is an urgent need for such a method.

Considerable time was spent on a method for the determination of tocopherol or vitamin E. The results obtained are not favorable. Possibly modification of existing methods or development of new ones may lead to better results. A good tocopherol method would be very useful in cases of suspected vitamin E deficiency in the feed as the cause of so-called "crazy chick" disease.

The use of sulfaguanidine and sulfaquinoxaline in starter and broiler mashes has necessitated analytical work for the determination of these drugs. Fortunately, there are comparatively simple methods for the determination of these ingredients.

One of the newest problems confronting control officials is that of a satisfactory procedure for control purposes for the determination of vitamin B₁₂, also called the Animal Protein Factor. Supplements have been registered and are being sold in many states with claims for high animal protein factor potency. The control official, as in the case of other claims, should be able to either substantiate or refute such claims.

In addition to the analytical work reported in this bulletin, the Feed Control Service analyzes many samples representing lots of feed delivered to the various State institutions. As a result of this work these institutions are now receiving better quality feed than was formerly the case. It is planned to extend this service to cover the feed delivered to each one of the 28 State institutions buying feed.

Many samples are analyzed, also, for individuals: including feed suspected of containing toxic ingredients; feed unfamiliar to the individual, who would like to know its feeding value; and feed thought to be not as guaranteed. A few samples of stomach contents and viscera of animals believed to have died of poisoning are received each year. If the circumstances warrant such action, a limited chemical examination is made in these cases.

A great deal of analytical work is done on feeds and other materials on research projects in which the Feed Control Service cooperates with the other Experiment Station departments originating the research projects.

Brands Substantially Complying with Guarantees

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Acme-Evans Co., Inc.							
Acme Hominy Feed.....	10.0	9.0	8.2	7.0	4.6	6.0	2.7
Acme Wheat Standard Middlings with Screenings.....	14.8	14.0	3.8	3.0	8.8	9.5	5.2
Albers Milling Co.							
Calf Manna (4) ^a	28.3	25.0	4.4	4.0	4.6	5.5	7.8
Allied Mills, Inc.							
Wayne All Mash Egg.....	18.0	15.0	5.1	2.5	8.4	8.0	7.7
Wayne All Mash Grower.....	17.7	15.0	4.8	2.5	7.5	8.0	9.7
Wayne Chick Starter.....	21.5	20.0	5.3	3.0	5.9	7.0	7.3
Wayne Chick & Broiler Ration.....	21.6	20.0	4.7	3.0	6.2	8.0	6.1
Wayne Complete Calf Starter.....	16.6	16.0	3.5	3.0	8.2	11.0	7.7
Wayne 16% Dairy Feed.....	20.5	16.0	4.0	3.0	11.0	13.0	9.6
Wayne Dairy Mixer.....	38.0	34.0	4.2	3.0	6.8	10.0	9.5
Wayne Egg Mash.....	21.3	20.0	4.6	3.0	8.0	8.0	8.9
Wayne Growing Mash.....	20.1	18.0	4.6	2.5	7.7	8.0	6.9
Wayne 20% National Dairy Feed.....	20.9	20.0	4.5	4.0	7.5	10.0	8.0
Wayne 16% National Dairy Feed.....	18.7	16.0	4.1	4.0	7.5	10.0	6.5
Wayne Pork Maker.....	15.7	14.0	4.2	3.0	8.0	8.0	6.9
Wayne Spring Pasture Poultry Pellets.....	30.3	27.0	5.4	3.0	9.3	12.0	10.5
Wayne Super Broiler Feed.....	23.4	22.0	4.4	3.5	5.5	4.5	8.1
Wayne Turkey Growing Mash.....	21.2	20.0	4.4	2.5	8.3	8.0	7.5
Wayne Turkey Starting Mash.....	28.5	25.0	5.0	3.0	7.6	8.0	9.0
American Flours, Inc.							
American Ace Wheat Standard Middlings and Wheat Screenings not to exceed 8%.....	15.0	15.0	4.7	3.5	8.5	9.5	5.8
American Maize-Products Co.							
Cream of Corn Gluten Feed.....	24.1	23.0	3.7	2.0	8.3	9.5	6.8
Arcady Farms Milling Co.							
Arcady Breeder Mash.....	23.1	20.0	4.5	3.5	6.6	8.0	10.4
Arcady Growing Mash.....	17.8	17.0	4.0	3.5	6.8	8.0	8.4
Wonderfat Station Feed.....	16.7	14.0	4.3	4.5	7.4	7.0	5.1
Ashcraft-Wilkinson Co.							
Cow-Eta Brand 41% Protein Prime Quality Cottonseed Meal.....	41.6	41.0	6.9	5.0	12.0	13.0	6.4
E. W. Bailey & Co.							
Bailey's Pennant Brand Breeder Mash ..	20.9	20.0	4.1	3.5	8.1	7.0	9.6
Bailey's Pennant Brand Chick Starter... ..	22.1	20.0	4.5	3.5	6.7	7.0	9.6
Bailey's Pennant Brand Complete Grower	17.7	15.0	4.6	3.5	8.3	7.5	8.3
Bailey's Pennant Brand 20% Dairy Ration.....	23.4	20.0	5.1	3.5	7.9	8.0	7.6
Bailey's Pennant Brand 16% Dairy Ration.....	18.8	16.0	3.9	3.5	9.4	10.0	6.2
Bailey's Pennant Brand Fitting Ration ..	15.8	14.0	4.3	3.5	10.0	11.0	7.7
Bailey's Pennant Brand Growing Mash... ..	20.8	18.0	4.3	3.5	7.3	7.5	9.1
Bailey's Pennant Brand Horse Feed.....	12.9	10.5	3.7	3.0	6.5	9.0	5.5
Bailey's Pennant Brand Laying Mash... ..	20.8	20.0	4.2	3.5	8.2	7.5	7.8
Bailey's Pennant Brand Pig Feed.....	17.7	17.0	3.5	3.5	7.8	7.0	7.8
Bailey's Pennant Brand Stock Feed.....	12.3	9.5	4.2	3.0	12.7	13.0	4.7
Bailey's Pennant Brand Turkey Fattener..	19.1	18.0	4.7	3.5	6.3	6.0	6.8
Barber & Bennett, Inc.							
Fort Orange 12% Fitting and Calf Grain Ration.....	13.0	12.0	3.7	4.0	6.9	8.5	6.6
Fort Orange Golden Test Ration.....	21.9	18.0	4.4	4.5	7.4	8.5	7.1
Fort Orange Pig & Hog Feed.....	15.6	15.0	3.4	3.5	8.0	9.0	8.4
Beacon Milling Co., Inc.							
Beacon "20".....	22.6	20.0	3.5	3.5	7.2	9.0	7.5
Beacon Sweet "20".....	21.2	20.0	3.6	3.0	7.5	9.0	7.7
Beacon Breeder Mash.....	23.9	22.0	5.2	3.5	6.4	7.5	10.9
Beacon Complete Starting Ration.....	26.9	25.0	5.0	3.5	4.2	6.0	6.7
Beacon Dairy Fitting.....	15.0	14.0	4.0	3.5	8.0	9.0	7.5
Beacon "22" Egg Mash.....	23.5	22.0	5.0	3.5	6.3	7.0	9.8
Beacon Goat Ration.....	19.5	16.0	3.5	3.5	8.0	10.0	5.9
Beacon Test Cow Ration.....	18.9	18.0	4.1	4.0	7.8	9.0	7.2
Beacon Turkey & Game Bird Fitting Ration.....	11.3	10.0	3.1	3.0	5.4	9.0	3.2
Beacon Turkey & Game Bird Grower (3)	23.6	22.0	5.0	3.5	5.8	7.0	9.2
Beacon Turkey & Game Bird Starter....	29.3	27.0	5.7	3.5	5.9	6.0	9.4

^a A number in parenthesis after the brand name indicates the number of samples analyzed.

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Bisbee Linsed Co.							
Bisbee Brand 32% Protein Old Process Linseed Oil Meal.....	35.9	32.0	5.6	3.5	9.1	10.0	6.4
Blatchford Calf Meal Co.							
Blatchford Complete Calf Ration.....	21.4	19.5	3.0	3.0	9.8	9.5	8.1
Borden Grain Co.							
Borden's Dairy Feed.....	21.4	20.0	5.6	4.0	8.6	10.0	8.3
Borden's Laying Mash.....	22.1	20.0	6.1	4.0	7.8	8.0	10.3
Borden's Starter and Growing Feed.....	20.0	17.0	5.6	4.0	8.6	8.0	9.6
Brown-Forman Distillers Corporation							
BF Corn Distillers Light Grains.....	26.8	26.0	9.0	8.0	12.3	15.0	1.7
George B. Brown Corporation							
Brown's Dairy Feed.....	18.1	17.0	3.1	4.0	11.8	12.0	6.4
Brown's Egg Mash.....	16.2	17.0	5.9	5.0	8.0	10.0	9.9
Brown's Growing Mash.....	15.6	15.0	5.4	5.0	8.5	10.0	9.4
Brown's Pig Feed.....	12.3	12.0	4.8	4.5	7.9	13.0	6.4
Cargill, Inc.							
Linseed Oil Meal.....	36.8	34.0	5.5	3.0	8.1	9.0	5.7
Clinton Industries, Inc.							
Clinton Corn Gluten Feed.....	28.8	23.0	2.5	2.0	7.1	8.5	6.1
Commander-Larabee Milling Co.							
Sunfed Wheat Bran with ground screenings not exceeding mill run....	16.6	14.0	4.6	4.0	11.2	12.0	6.7
Consolidated Chemical Industries, Inc.							
Digesta-Bone.....	7.5	5.0	0.4	—	—	—	86.1
Consolidated Rendering Co.							
Corenco Feeding Bone Meal.....	13.6	10.0	5.5	—	—	—	73.4
Corenco Fish Meal (2) (b).....	59.9	58.0	11.9	5.0	—	—	20.6
Corenco 47% Meat & Bone Scrap.....	49.3	47.0	7.4	6.0	—	—	33.7
Corenco 45% Meat & Bone Scrap (b)...	46.1	45.0	7.0	6.0	—	—	38.6
Corn Products Refining Co.							
Buffalo Corn Gluten Feed.....	23.2	23.0	1.7	1.0	8.6	9.0	5.8
Courcy & Sons Grain Co.							
Courcy's Dairy Feed.....	19.1	17.0	4.0	4.0	7.6	8.0	8.0
Courcy's Horse Feed.....	11.0	11.0	4.0	4.0	6.0	8.0	3.6
Chas. M. Cox Co.							
Provender.....	11.3	9.0	4.0	3.0	5.1	8.0	2.2
Utility 20 Dairy Ration (2).....	20.3	20.0	4.0	3.0	10.8	11.0	8.1
Utility 16 Dairy Ration.....	19.1	16.0	3.1	2.5	12.9	12.0	8.0
Wirthmore Breeder Mash.....	22.4	20.0	4.0	3.0	6.3	7.0	10.6
Wirthmore Calf Starter (2).....	24.2	22.0	4.1	3.5	7.1	7.0	5.7
Wirthmore Calving Ration.....	16.1	14.0	4.2	4.0	8.6	11.0	7.0
Wirthmore Complete Breeder Ration....	15.6	15.0	4.2	3.0	5.3	6.0	6.2
Wirthmore Complete Egg Ration (2)....	16.5	15.0	4.1	3.0	5.5	6.0	6.7
Wirthmore Complete Growing Ration...	16.4	14.5	4.5	3.0	5.7	6.0	7.5
Wirthmore 20 Dairy Ration.....	22.6	20.0	4.0	3.5	7.0	8.0	8.6
Wirthmore 16 Dairy Ration.....	18.4	16.0	4.7	3.5	7.0	9.0	8.2
Wirthmore 14 Fitting Ration.....	17.1	14.0	4.5	4.0	7.3	9.0	7.1
Wirthmore Growing Mash.....	19.1	18.0	4.3	3.0	6.5	7.0	9.5
Wirthmore Hi-Ener-G Starter and Broiler	21.2	20.0	3.8	3.0	3.8	4.5	5.0
Wirthmore Sulfaquinoxaline Mixture with Wirthmore Hi Ener-G Starter and Broiler Ration.....	23.6	20.0	3.5	3.0	4.5	4.5	6.0
Wirthmore Horse Feed.....	12.3	10.0	4.5	3.25	8.2	9.0	4.8
Wirthmore Laying Mash.....	20.4	20.0	4.3	3.0	6.4	7.0	9.2
Wirthmore Mash with Sulfaquinoxaline...	24.1	20.0	4.3	3.0	6.0	6.5	6.1
Wirthmore Mink Food.....	25.6	23.0	5.7	4.0	5.4	6.0	10.7
Wirthmore Pig and Hog Feed.....	18.9	17.0	4.8	4.0	7.0	8.0	8.1
Wirthmore Poultry Flush.....	17.8	15.0	2.9	3.0	5.3	6.0	8.8
Wirthmore Rabbit Pellets.....	16.7	14.0	4.6	3.0	10.7	12.0	7.8
Wirthmore 20 Record Ration.....	22.4	20.0	4.0	3.5	7.0	9.0	7.8
Wirthmore 16 Record Ration.....	17.8	16.0	4.3	3.5	8.3	9.0	7.0
Wirthmore Starter and Broiler (2).....	22.2	20.0	4.3	3.0	6.1	6.5	6.8
Wirthmore Sulfaquinoxaline Mixture with Wirthmore Starter and Broiler...	21.9	20.0	3.8	3.0	6.0	6.5	6.6
Wirthmore Stock Feed.....	12.4	10.0	4.1	3.0	10.3	11.0	8.0
Wirthmore Super Pellets.....	23.0	20.0	4.0	3.0	6.4	8.0	8.0

b See also table of "Brands Not Conforming to Guarantees".

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Chas. M. Cox Co.—Con.							
Wirthmore Turkey Fattening Ration.....	19.8	16.0	4.2	3.0	6.2	7.0	7.3
Wirthmore Turkey Growing Ration.....	22.2	20.0	4.0	3.0	6.7	7.5	10.0
Wirthmore Twin-Mix Calf Ration.....	20.2	16.0	4.1	4.0	7.4	8.0	5.9
Crawford Brothers, Inc.							
Crawford Complete Turkey Grower (2)...	20.0	18.0	4.4	3.5	8.2	8.0	7.4
Crawford Fattening-Finishing Pellets....	15.8	14.0	4.8	4.5	7.9	6.5	8.2
Crawford Laying Mash.....	22.3	20.0	4.2	3.5	8.4	8.0	9.5
Crawford Producer 20%.....	21.5	20.0	5.1	4.0	10.2	10.0	6.6
Crawford Rabbit Pellets.....	17.7	16.0	4.0	3.0	10.1	9.0	7.8
Crawford Summertime Ration 16%.....	19.3	16.0	4.5	3.5	10.1	9.0	8.7
Star Complete Egg Mash.....	15.9	15.0	4.0	3.0	8.0	9.0	7.3
Star Complete Growing Mash.....	15.7	15.0	3.8	3.0	7.8	9.0	7.1
Curley Grain & Fuel Co.							
Crystal 20% Breeder Mash.....	19.2	20.0	5.0	4.5	7.6	7.5	10.4
Crystal Complete Growing Mash.....	16.6	15.0	4.5	4.0	6.2	7.0	7.2
Crystal 16% Complete Laying Mash (2)...	17.1	16.0	4.4	4.0	6.5	7.5	7.5
Crystal Connecticut Broiler Ration.....	21.9	21.0	5.0	4.5	3.3	3.0	7.5
Crystal Dairy Ration 20%.....	22.4	20.0	5.8	4.0	8.4	13.0	9.7
Crystal 20% Dairy Feed.....	22.6	20.0	3.1	3.5	7.8	8.0	9.1
Crystal 18% Growing Mash (2).....	20.3	18.0	4.6	3.5	7.4	7.5	8.5
Crystal Growing Mash.....	20.2	16.0	3.7	4.0	8.1	7.0	9.8
Crystal 20% Laying Mash (3).....	22.1	20.0	4.7	4.0	6.9	7.5	10.5
Crystal Laying Mash.....	20.7	19.0	4.0	3.5	8.2	7.0	9.7
Crystal 20% Starter-Broiler Mash (3)...	22.9	20.0	4.5	3.5	6.5	7.0	7.8
Crystal Starter & Broiler.....	21.6	16.0	4.0	4.0	7.4	6.0	9.6
Daily Mills, Inc.							
Double Diamond 16% Test Ration.....	18.5	16.0	5.0	4.0	8.6	9.0	7.7
Delaware Mills, Inc.							
Delaware Egg Mash.....	19.9	18.0	4.1	3.0	7.8	8.0	8.9
Delaware Fitting Ration.....	16.6	14.0	4.2	3.0	8.3	10.0	6.2
Delaware Growing Mash.....	20.8	18.0	4.4	3.0	6.2	6.5	7.2
Delaware Horse Feed.....	11.3	9.0	3.2	3.0	10.6	11.0	4.0
Delaware Laying Mash.....	22.6	20.0	3.7	3.0	7.4	8.0	7.7
Delaware Pig and Hog Feed.....	18.0	16.0	4.8	4.0	7.4	8.0	6.0
Delaware Starter & Broiler Ration (2)...	22.1	20.0	4.6	3.0	7.6	8.0	9.1
Delaware Sweet 16% Dairy Feed.....	18.9	16.0	3.5	3.5	9.0	11.0	8.2
Frank Diauto							
Diauto's 18% Broiler Ration.....	18.7	18.0	5.3	4.5	6.9	6.0	8.4
Diauto's Special Egg Mash.....	19.5	18.0	4.5	4.0	6.7	7.0	9.8
F. Diehl & Son, Inc.							
Diehl's Dairy Feed.....	20.5	18.0	4.0	3.0	8.4	12.0	8.1
Diehl's Dry Mash.....	21.1	20.0	4.5	3.0	8.0	8.0	9.2
Diehl's Fitting Ration.....	16.8	14.0	3.3	3.0	8.0	10.0	7.6
Diehl's Starter Mash.....	20.3	18.0	4.3	3.0	7.3	8.0	9.2
Dietrich & Gambrell, Inc.							
D & G Broiler Mash.....	21.1	20.0	4.7	3.5	5.4	7.0	8.1
D & G Fleshing Mash Pellets.....	17.3	15.0	4.7	3.5	6.5	6.5	7.0
D & G Growing & Fitting Ration.....	16.0	15.0	3.5	3.5	7.3	10.0	6.5
D & G Pig & Hog Meal.....	19.5	18.0	3.6	3.5	7.1	8.0	7.6
D & G Special Broiler Mash.....	22.3	21.0	3.5	4.0	3.8	4.0	7.2
D & G Sulfaquinoxaline Mixture with Special Broiler Mash.....	21.2	21.0	3.6	4.0	3.3	4.0	7.3
D & G Frederick Laying Mash.....	20.0	18.0	3.9	3.5	6.5	8.0	7.4
D & G Gambrell's Chick Starter.....	21.2	20.0	4.5	3.5	5.3	7.0	8.5
D & G Gambrell's Growing Mash.....	20.0	18.0	3.5	3.5	5.9	8.0	7.6
D & G Gambrell's Laying Mash.....	23.0	20.0	3.8	3.5	6.3	8.0	9.2
Pen Mar 20% Dairy.....	23.2	20.0	3.8	3.5	8.1	10.0	7.3
Pen Mar Horse & Stock Feed.....	10.6	10.0	4.2	3.0	7.3	12.0	3.6
J. L. Dunnell & Son							
Excel 18% Dairy Ration.....	17.3	18.0	3.7	4.5	9.6	9.0	6.4
Excel Fitting Ration.....	17.8	14.0	5.0	5.0	8.6	10.0	6.3
Excel Laying Mash.....	20.6	19.0	4.6	4.5	6.1	6.0	8.9
Starter and Grower—Horner's.....	18.3	18.0	4.6	4.5	6.3	6.0	8.0
East Longmeadow Grain Store							
Blue Ribbon All Mash Grower.....	17.6	15.0	5.0	4.0	5.6	8.0	8.9
Blue Ribbon 16% Dairy.....	18.1	16.0	4.2	3.5	7.4	9.5	10.4
Blue Ribbon Dry & Freshening Feed....	15.9	12.0	4.0	3.5	7.9	9.5	9.4
Blue Ribbon Pig & Hog Feed.....	18.5	17.0	4.7	3.5	6.4	9.0	12.0

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Eastern States Farmers' Exchange, Inc.							
Eastern States All-Mash Developer.....	17.7	15.5	4.3	3.0	6.1	7.0	7.4
Eastern States All-Mash Egg.....	18.4	15.5	4.0	3.0	5.4	7.0	9.3
Eastern States Calf Starter.....	23.3	23.0	4.1	3.5	5.2	7.0	7.3
Eastern States Calving Ration.....	11.6	11.5	2.0	2.0	13.3	18.0	7.9
Eastern States Egg Mash Pellets.....	20.8	20.0	4.2	2.5	6.4	7.0	10.9
Eastern States Fitting Ration.....	16.4	14.0	3.5	3.0	8.9	10.0	6.6
Eastern States Fulpail.....	21.9	20.0	3.6	3.5	8.5	9.0	6.3
Eastern States Horse Feed.....	12.0	10.5	3.5	3.5	6.3	8.0	5.6
Eastern States Milkmore.....	19.1	16.0	4.3	3.5	7.5	9.0	6.8
Eastern States Minuteman Mash with 1% Sulfaquinoline.....	21.3	20.0	4.0	3.0	4.0	6.0	6.6
Eastern States Pacemaker.....	22.2	20.0	3.6	3.0	3.0	4.0	7.3
Eastern States Pacemaker—WS Mixture (Sulfaquinoline).....	20.8	20.0	4.6	3.0	3.0	4.0	6.5
Eastern States Pig Starter & Breeder.....	20.0	20.0	4.5	3.0	6.5	7.5	7.1
Eastern States Pork Builder.....	17.1	15.0	4.5	3.0	7.0	6.5	6.9
Eastern States Sheep and Goat.....	17.3	16.0	3.8	3.5	6.3	8.0	5.7
Eastern States 32% Supplement.....	36.0	32.0	3.9	4.0	7.4	8.0	10.1
Eastern States Turkey-Grower.....	22.8	20.0	3.8	2.5	6.4	7.0	9.3
Elmore Milling Co., Inc.							
Elmore Breeder Mash.....	21.4	20.0	5.0	4.0	8.0	8.0	9.8
Elmore Bull Feed.....	15.6	13.6	4.3	3.5	8.0	9.0	3.6
Elmore Chixsaver.....	21.0	20.0	5.1	4.0	6.9	6.0	7.9
Elmore Complete Broiler Ration.....	26.9	20.0	5.4	4.0	7.6	7.0	9.0
Elmore Complete Growing Ration.....	18.7	15.0	4.9	3.5	7.7	8.0	9.5
Elmore Complete Layer and Breeder.....	18.4	15.0	4.6	4.0	7.3	8.0	8.7
Elmore Complete Market Egg Mash.....	17.0	15.0	4.5	3.5	6.7	8.0	8.8
Elmore Complete Rabbit Ration (2).....	20.7	16.0	5.0	3.5	9.6	10.0	6.2
Elmore Dry and Freshening Ration.....	18.2	12.0	4.0	3.3	7.4	10.0	4.0
Elmore Egg Mash Pellets.....	20.7	20.0	5.0	4.0	8.5	8.0	9.2
Elmore Fitting Ration.....	16.4	14.0	4.0	4.0	6.6	10.0	4.8
Elmore Goat Ration.....	17.6	16.0	3.4	4.0	7.0	10.0	3.9
Elmore Grand Champion Ration.....	15.3	15.0	4.2	3.5	8.2	10.0	3.8
Elmore Growing Mash (3).....	19.7	18.0	5.3	3.5	7.5	8.0	9.3
Elmore Horse Feed.....	11.3	9.0	2.7	2.5	5.0	11.0	3.0
Elmore Improved Calf Starter.....	22.1	20.0	4.6	4.0	5.3	8.0	5.6
Elmore M. A. C. Laying Mash.....	20.9	18.0	3.7	4.0	7.0	8.0	8.5
Elmore Milk Grains "Sixteen".....	17.5	16.0	4.3	4.5	7.2	10.0	6.5
Elmore Test Ration.....	18.1	18.0	4.2	4.0	7.4	10.0	6.0
Elmore Turkey Finisher (Fattener).....	18.3	17.0	5.1	4.0	6.6	8.0	10.2
Elmore Turkey Fitting Ration.....	14.5	12.0	2.6	3.0	4.8	10.0	4.0
Elmore Turkey Growing Mash (b).....	21.7	20.0	5.4	4.0	7.9	8.0	9.1
John W. Eshelman & Sons							
Concestoga 20 Dairy Feed.....	21.0	20.0	3.9	4.0	9.0	11.0	9.3
Pennsy Laying Mash.....	24.5	20.0	3.8	3.0	6.7	9.0	7.8
Red Rose Complete Laying Mash.....	16.8	15.0	4.6	3.5	6.7	6.5	7.0
Red Rose 18 Dairy Feed.....	20.7	18.0	4.1	4.0	8.3	9.0	6.3
Red Rose 16 Dairy.....	17.8	16.0	4.0	3.5	7.6	11.0	6.7
Red Rose Fattening Mash.....	15.7	14.0	4.9	4.0	6.3	5.5	5.4
Red Rose Fitting Ration.....	14.2	12.0	3.8	3.5	6.8	7.0	5.2
Red Rose Flushing & Conditioning Mash.....	15.8	15.0	2.8	2.5	5.7	6.5	6.5
Red Rose Growing Mash.....	22.9	18.0	4.3	3.5	6.6	7.5	8.3
Red Rose Horse Feed.....	10.8	9.0	4.2	3.0	6.6	10.0	3.0
Red Rose Laying Mash.....	24.4	20.0	4.0	3.5	6.8	7.5	8.6
Red Rose Pig & Hog Meal.....	20.2	18.0	3.8	3.5	10.2	10.0	11.2
Red Rose Turkey Grower.....	23.0	20.0	4.5	3.5	6.8	8.0	8.5
S O S.....	13.9	11.0	2.4	2.0	15.9	15.0	8.2
Farm Bureau Association							
Breeder Mash.....	21.4	20.0	4.6	4.0	5.4	7.5	7.2
Broiler Mash.....	22.2	20.0	4.8	3.5	4.1	4.0	6.2
Chick Starter Mash.....	23.6	20.0	3.7	4.0	5.4	7.0	7.9
Complete Market Egg Mash.....	19.1	16.0	5.2	3.5	7.6	7.5	8.1
Dairy 20%.....	20.5	20.0	4.0	3.5	6.4	9.0	6.6
Dairy 18%.....	18.8	18.0	4.0	4.0	6.4	9.0	4.9
16% Dairy Ration.....	19.6	16.0	4.1	4.0	6.8	9.0	6.2
Developer Mash (3) (b).....	19.1	18.0	4.1	3.5	7.5	8.0	7.8
Fitting Ration.....	12.7	12.0	3.8	4.0	6.5	9.0	5.4
Horse Feed.....	11.4	11.0	3.1	3.5	5.5	8.0	3.2
Market Egg Mash.....	20.6	20.0	4.4	3.5	5.7	7.5	7.4
14% Milking Ration.....	15.6	14.0	3.8	4.0	7.0	10.0	5.0
Turkey Grower.....	21.4	20.0	3.9	3.5	6.6	8.0	7.9
Turkey Grower and Finisher (3) (b).....	20.5	20.0	4.9	3.5	6.6	8.0	7.8

b See also table of "Brands Not Conforming to Guarantees".

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Farmers Feed Co.							
Bull Brand Dried Brewers Grains (2)	28.4	26.0	7.0	6.0	13.7	17.0	3.7
Fernau Grain Co.							
F Corn Distillers Dried Grains	28.5	28.0	12.2	9.0	12.2	14.0	1.8
Flory Milling Co., Inc.							
Flory 20% Dairy Feed	22.0	20.0	3.8	3.5	8.2	10.0	9.0
Flory N-er-G Mash	16.1	15.0	2.8	3.0	4.3	6.0	6.3
Golden Egg Layer Mash	20.9	20.0	4.0	3.0	7.7	8.5	9.8
Fred A. Fountain							
Fountain's Breeder Mash	22.7	20.0	4.5	3.5	6.9	7.5	9.6
Fountain's Grower Mash	20.3	18.0	4.5	3.5	7.6	7.5	10.5
Fountain's Starting & Broiler Mash	23.2	20.0	5.0	3.5	6.7	7.5	7.9
J. B. Garland & Son, Inc.							
Royal 16% Dairy Ration	20.1	16.0	4.0	3.0	9.2	12.0	7.8
Gateway Milling Association, Inc.							
Gateway All Mash Grower	16.4	15.0	3.8	3.5	6.9	7.0	5.4
Gateway All Mash Layer	20.9	15.0	3.3	3.5	7.7	7.5	6.9
Gateway Broiler Mash	23.2	20.0	3.5	3.0	7.8	7.5	6.5
Gateway 20% Dairy Feed	21.2	20.0	3.5	3.5	9.3	10.0	9.6
Gateway Starting Mash	18.7	17.5	4.4	3.5	6.8	6.5	7.2
Gateway Starting & Broiler Mash	20.5	20.0	5.3	4.0	4.2	4.0	7.3
General Mills, Inc.							
Washburn's Gold Medal Hard Wheat Adrian Red Dog	18.1	16.0	4.1	3.5	2.3	4.0	3.0
General Mills, Inc., Farm Service Division							
Farm Service 20% Dairy Ration	23.6	20.0	4.3	3.5	8.4	11.0	7.8
Farm Service 14% Fitting Ration	16.9	14.0	5.0	4.0	8.4	10.0	6.4
Farm Service Horse Feed	11.0	9.0	3.8	3.0	6.8	9.5	4.2
Farm Service Stock Feed	9.2	8.5	3.9	3.5	11.3	12.5	5.2
Vigor 16% Dairy Feed	18.2	16.0	3.5	3.0	12.6	12.0	9.6
Vigor Hog Feed	15.1	15.0	4.4	3.0	8.3	7.0	9.7
Vigor Laying Mash	19.6	18.0	4.3	3.0	12.2	11.0	10.9
General Mills, Inc., Larowe Division							
Dried Beet Pulp	9.6	7.0	0.5	0.3	21.3	22.5	3.7
Larro Broiler Feed (2)	21.6	20.0	4.0	3.5	5.4	7.0	6.8
Larro Calf Builder	28.8	24.0	3.8	3.5	4.2	6.5	7.8
Larro Chick Builder	23.0	20.0	3.6	3.5	6.7	7.0	9.2
Larro 32% Dairy Concentrate	34.6	32.0	3.5	3.0	8.5	11.0	8.6
Larro 20% Dairy Feed	22.4	20.0	3.3	3.0	8.5	12.0	8.1
Larro 16% Dairy Feed	19.1	16.0	4.1	3.0	8.8	12.0	6.8
Larro Egg Mash	20.9	20.0	4.8	3.5	7.0	8.0	8.7
Larro Green Pellets for Rabbits	17.9	15.0	3.2	2.0	17.8	19.0	7.7
Larro Poultry Breeder Mash	20.8	20.0	4.6	3.5	7.4	8.0	9.6
Larro Sow and Pig Builder	19.8	17.5	4.1	3.5	7.4	8.0	8.5
Glidden Co., Feed Mill Division							
Glidden All-Mash Layer	17.1	15.0	3.5	3.0	5.9	7.0	7.7
Glidden Breeder Mash	21.4	20.0	4.7	3.0	5.4	8.0	8.9
Glidden Broiler Ration	22.9	20.0	4.5	3.0	4.5	7.0	7.6
Glidden 20% Dairy Feed	21.6	20.0	4.7	3.0	8.8	9.0	8.8
Glidden Growing Mash (2)	19.6	17.0	3.8	3.0	5.6	7.0	8.5
Glidden 18% Pig Meal	20.8	18.0	3.3	3.0	7.8	8.0	8.4
Glidden Super Broiler Ration	24.8	22.0	5.4	3.0	2.9	4.0	7.3
D. H. Grandin Milling Co.							
Grandin's All-Mash Layer	15.9	15.0	3.7	3.0	6.4	8.0	9.0
Grandin's 14 Fitting Ration	15.8	14.0	3.6	3.5	5.4	10.0	6.5
Grandin's Horse Feed	11.4	9.5	3.6	3.5	6.9	11.0	4.1
Grandin's Laying Mash	21.1	20.0	3.3	3.0	4.2	8.0	9.0
Grandin's 20 Milk Maker	19.9	20.0	4.3	3.5	6.7	10.0	7.2
Grandin's Stock Feed	10.2	9.0	4.0	3.5	8.9	12.0	6.4
Grandin's 18 Test Ration	18.2	18.0	4.6	3.5	7.0	10.0	7.3
D. Harbeck & Sons							
Welcome Dairy Feed	19.5	20.0	3.8	4.0	8.3	10.0	6.5
Welcome Growing Mash	17.3	18.0	4.2	4.0	5.9	7.0	9.3
Welcome Starter & Broiler Mash	18.6	18.0	4.3	4.0	5.8	7.0	10.7
Harper Feed Mills, Inc.							
Green Pasture 16% Dairy Ration	16.4	16.0	2.2	3.0	10.7	12.0	11.3
Harco Complete Starting and Growing Ration	18.7	17.0	4.3	3.0	5.4	7.5	7.8

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Harper Feed Mills, Inc.—Con.							
Harco 20% Dairy Ration.....	19.3	20.0	3.3	3.0	7.9	11.0	9.9
Harco Laying Mash.....	20.8	20.0	3.2	3.0	6.6	7.5	9.8
Harco Laying & Breeder Mash.....	22.6	20.0	3.4	3.0	6.0	7.0	9.9
Harco Range Growing Mash.....	20.5	17.0	3.7	3.0	5.7	7.5	9.2
E. C. & W. L. Hopkins, Inc.							
Granite State Growing Mash.....	21.5	19.0	5.1	3.0	8.2	7.0	8.7
Humphreys-Godwin Co.							
Dixie Brand 41% Protein Prime Quality Cottonseed Meal.....	42.4	41.0	7.8	5.0	10.4	12.0	6.6
Illinois Cereal Mills, Inc.							
Hominy Feed (2).....	11.2	10.0	6.2	6.0	4.4	5.0	2.7
International Milling Co.							
Blackhawk Wheat Bran with ground wheat screenings not exceeding 8% (2).....	19.6	15.0	5.1	2.5	7.9	12.0	5.3
Henkel's Wheat Bran with ground wheat screenings not exceeding 8%.....	15.4	13.5	3.6	2.5	9.9	12.0	6.0
Jaquith & Co.							
Jaquith 20% Dairy Ration.....	20.1	20.0	4.3	3.5	6.6	10.0	8.5
Jaquith Growing Mash.....	21.9	17.0	5.3	3.5	6.3	8.0	10.8
Jaquith Laying Mash.....	22.1	19.0	5.2	3.5	6.8	8.0	9.6
Kansas Flour Mills Co. (Trade Name) of Flour Mills of America, Inc.							
Big Flake Pure Wheat Bran.....	16.4	15.0	3.5	3.5	9.1	11.0	5.6
Kasco Mills, Inc.							
Kasco All-Mash Grower.....	16.6	15.0	4.1	3.0	5.8	7.0	7.3
Kasco Beatsall Milk Grains 16%.....	18.2	16.0	4.7	3.5	8.5	10.0	7.1
Kasco Fitting Ration.....	14.9	14.0	4.4	3.5	7.7	10.0	5.8
Kasco Sweet 16% Dairy Feed.....	17.3	16.0	4.4	3.0	10.3	12.0	8.4
Kellogg Co.							
Kellogg's Hominy Feed (2).....	10.8	10.0	7.3	6.0	4.7	5.0	2.5
Spencer Kellogg & Sons, Inc.							
34% Protein Old Process Linseed Oil Meal (2).....	35.6	34.0	4.1	3.5	9.1	9.0	5.5
Kronick's Coal & Grain Co.							
Kronick's Egg Mash.....	20.0	20.0	4.9	4.5	6.7	6.5	10.9
Kuder Citrus Pulp Co.							
Kuder Dried Citrus Pulp.....	5.8	6.0	4.8	5.0	9.2	13.0	6.4
Larabee Flour Mills Co.							
Sunfed Winter Wheat Bran with Ground Wheat Screenings not to exceed mill run or 8%.....	15.9	15.0	4.2	3.5	9.8	11.0	6.9
Lauhoff Grain Co.							
Vermilion Hominy Feed.....	10.9	9.0	5.7	6.0	4.8	6.0	2.7
Mackenzie & Winslow, Inc.							
Money's Worth Dairy Feed 20%.....	20.8	20.0	4.3	4.0	10.3	9.5	5.9
Money's Worth Fitting Ration.....	18.0	14.0	4.5	4.5	9.4	10.0	6.3
Money's Worth Growing Mash.....	18.8	17.0	4.3	4.0	6.9	7.0	8.5
Money's Worth Laying Mash.....	20.9	18.0	4.2	4.5	6.9	7.0	8.9
Money's Worth Pig & Hog Feed.....	17.1	13.0	5.6	5.0	7.5	7.0	6.0
Money's Worth Starter.....	21.2	19.0	5.0	4.5	6.6	6.5	8.5
Money's Worth Turkey Fattener.....	14.9	12.0	4.5	3.0	6.0	6.0	5.9
Maine Fish Meal Co.							
Maine Concentrate (3).....	55.1	50.0	17.2	15.0	0.6	1.0	19.3
Mansfield Milling Co.							
Mansfield "20".....	20.8	20.0	3.4	4.0	9.6	10.0	6.8
Mansfield Chick Growing Mash.....	18.7	17.0	4.1	4.0	6.8	8.0	8.5
Mansfield Chick Starter.....	21.3	17.0	5.1	3.5	6.6	6.5	9.2
Mansfield Dry Poultry Mash (2).....	20.4	20.0	4.3	5.0	6.9	7.0	8.7
Marltime Milling Co., Inc.							
B-B Chick Feed.....	10.5	10.0	2.6	2.0	1.4	4.0	1.5
B-B Complete Growing Ration.....	19.7	16.0	3.9	3.5	7.2	8.5	8.0
B-B Complete Laying Ration.....	18.0	16.0	3.8	3.0	7.4	8.5	7.1

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Maritime Milling Co., Inc.—Con.							
B-B Complete Rabbit Feed (Pellets)	18.9	17.5	3.5	2.5	11.1	12.0	9.7
B-B Conditioning Mash	16.1	14.0	3.6	3.0	4.2	6.0	7.6
Sweetened Bull Brand "20" Dairy Ration . . .	22.2	20.0	3.9	3.5	7.3	9.0	6.9
Sweetened Bull Brand "16" Dairy Ration . . .	17.3	16.0	4.4	4.0	8.9	9.0	7.9
Bull Brand B-B Dry and Fresh Cow Fitting Ration	15.6	13.0	4.7	3.5	9.3	10.0	7.9
B-B Egg Mash	22.6	20.0	4.4	3.0	6.4	8.0	9.0
B-B Horse Feed	10.7	9.0	3.2	3.0	7.4	10.0	6.0
B-B Pig & Hog Feed	17.7	15.0	4.5	3.5	7.5	7.5	10.2
B-B Supplemental Pellets for Layers and Breeders	26.4	24.0	3.7	3.5	5.5	7.0	9.4
B-B Ma-Co High Energy Low Fiber Breeder Mash	24.5	21.0	4.5	3.0	3.8	5.0	9.6
B-B Ma-Co High Energy Low Fiber Broiler Ration (2)	23.1	22.0	4.3	4.0	3.4	3.9	5.6
Sulfaquinoxaline Mixture—B-B Ma-Co High Energy Broiler Ration	23.6	22.0	4.5	3.0	3.5	3.9	5.5
B-B Ma-Co High Energy Low Fiber Complete Breeder Ration	20.1	18.0	4.5	3.0	3.7	5.0	7.6
B-B Ma-Co High Energy Low Fiber Complete Laying Ration (2)	21.3	18.0	4.1	3.0	4.5	5.0	8.3
B-B Ma-Co High Energy Low Fiber Egg Mash	23.1	21.0	4.5	3.0	3.9	5.0	8.1
Dollar Maker Egg Mash	23.5	18.0	4.6	3.5	7.3	8.5	10.9
Hi-Test Dairy Feed 20% Pro.	22.4	20.0	3.1	3.5	9.5	12.0	9.2
Hi-Test Hog Feed	15.9	14.0	3.6	3.5	8.3	9.0	9.6
Miner-Hillard Milling Co.							
Choice Steam Cooked Hominy Feed	11.2	10.0	6.4	5.0	4.7	5.0	3.2
Geo. O. Moon & Co., Inc.							
Bulky Cow Feed	13.7	11.0	2.5	2.0	15.1	16.0	9.9
Moon's Complete Laying Mash	20.6	16.0	4.6	3.0	8.4	9.0	9.4
Moon's 24% Dairy Ration	25.0	24.0	4.5	3.0	9.5	10.0	9.1
Moon's 16% Test Ration	18.4	16.0	4.2	4.0	8.9	8.0	7.6
Special A Dairy 20% Ration	23.6	20.0	4.6	3.0	9.1	10.0	8.8
Special A Dairy 18% Ration	22.8	18.0	4.0	3.0	9.7	12.0	9.3
Special A Dairy 16% Ration	20.1	16.0	3.3	3.0	11.4	12.0	8.6
U. S. 20% Dairy Ration	22.8	20.0	2.9	3.0	12.8	12.0	9.3
Jas. F. Morse & Co.							
Morse's 50% Meat & Bone Scraps	51.6	50.0	11.2	8.0	—	—	29.5
Mount Vernon Milling Co.							
Poco Hominy Feed	11.4	10.0	6.6	5.5	4.7	6.0	2.8
Ogden Grain Co.							
"Biddy" Mash	22.4	20.0	4.5	4.0	8.3	10.0	8.3
Ogden Complete Pellets (2)	18.2	16.0	4.6	3.0	9.9	9.0	8.3
Ogden Complete Starter-Grower-Layer- Breeder	20.2	16.0	3.7	4.0	9.3	9.0	7.9
Ogden Fitting Ration	15.7	12.0	4.3	4.0	8.0	10.0	5.8
Ogden Growing Mash	22.8	18.0	4.5	4.0	6.9	9.0	8.0
Ogden Horse Feed	11.6	10.0	3.3	3.0	6.3	9.0	3.6
Ogden Layer & Breeder	21.0	20.0	4.6	4.0	7.5	9.0	8.5
Ogden Pig Feed	18.7	14.0	4.8	3.5	7.8	12.0	8.6
Oswego Soy Products Corp.							
Soy Bean Oil Meal Toasted	46.8	44.0	3.3	2.5	6.5	7.0	5.4
Palm Grain Co.							
Palm's Complete Starter-Grower-Layer . . .	18.5	16.0	5.0	4.0	9.0	8.0	7.8
Park & Pollard Co., Inc.							
Hi-Valu Scratch Pellets	14.8	12.0	3.6	2.5	6.1	6.5	6.3
Lay or Bust Chick Starter	20.4	20.0	3.1	2.5	5.5	7.0	9.2
Lay or Bust Egg Mash	22.4	20.0	3.2	2.5	6.4	7.5	10.6
Milk-Maid Fitting Ration	16.3	14.0	3.3	3.0	7.8	9.0	8.6
Yankee Horse Feed	11.7	10.0	3.7	2.5	7.8	10.0	5.0
George H. Parker Grain Co.							
Parker's Connecticut Broiler Ration	22.0	21.0	5.4	4.5	2.7	3.0	6.7
Parker's Egg Mash	19.3	19.0	4.8	4.0	8.0	7.5	8.9
Parker's Starter-Broiler Mash	23.9	18.0	4.4	4.0	7.4	7.0	7.2
Parrish & Heimbecker, Ltd.							
Parrheim Pure Wheat Shorts (2)	18.5	16.0	5.5	5.0	5.4	8.0	4.6

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Pasco Packing Co. Sugar Sweet Citrus Pulp (2).....	6.0	6.0	3.8	2.75	11.1	14.0	6.3
Penick & Ford, Ltd., Inc. Douglas Corn Gluten Feed.....	25.0	23.0	1.5	1.5	8.0	8.5	5.8
Pillsbury Mills, Inc. Pillsbury's Hard Wheat Bran with Ground Wheat Screenings not exceeding mill run.....	15.6	14.0	4.3	4.0	10.3	12.0	6.6
Pillsbury's Hard Wheat Standard B Middlings with Ground Wheat Screenings not exceeding mill run.....	16.9	15.0	5.0	4.0	8.6	9.5	5.2
Publicker Industries, Inc. 25% Corn Distillers Dried Grains.....	28.4	25.0	10.7	8.0	9.8	15.0	4.3
Quaker Oats Co. Ful-O-Pep Cali Ration.....	17.2	16.0	4.3	3.5	7.6	9.0	7.8
Ful-O-Pep Chick Starter.....	20.3	18.0	6.4	4.0	7.4	8.0	8.1
Ful-O-Pep 16% Dairy Ration.....	17.6	16.0	4.3	3.5	9.1	11.0	8.4
Ful-O-Pep Fitting Ration.....	14.2	14.0	4.1	3.5	8.3	11.0	7.0
Ful-O-Pep Growing Mash.....	19.6	19.0	5.2	4.0	6.9	8.0	9.7
Ful-O-Pep Horse Feed.....	13.3	12.0	3.8	3.0	7.5	11.0	5.8
Ful-O-Pep Laying Mash.....	21.8	20.0	4.5	3.5	7.8	8.0	8.9
Ful-O-Pep Pig-N-Sow Feed.....	20.1	18.0	5.2	3.5	7.0	8.0	7.8
Ful-O-Pep Rabbit Pellets.....	18.4	16.0	4.5	2.5	11.4	15.0	7.9
Ful-O-Pep Super Greens.....	20.7	19.0	5.6	4.5	7.0	8.0	8.7
Peterborough Oat Feed (3).....	4.3	3.5	1.5	1.0	31.3	32.5	5.8
Quaker 20% Protein Dairy Ration.....	22.9	20.0	3.2	3.0	10.5	12.0	8.1
Quaker 16% Protein Dairy Ration.....	18.7	16.0	3.0	2.5	10.7	12.0	8.4
Quaker Pig-N-Hog Feed.....	16.9	16.0	4.3	3.5	6.6	10.0	7.4
Quaker Sugared Schumacher Feed.....	14.2	12.0	4.0	2.5	9.6	12.0	6.1
Vim Oat Mill Feed.....	5.0	3.5	1.6	1.0	30.5	34.0	5.4
Ralston Purina Co. Corn and Oat Provender.....	10.0	10.0	4.1	3.5	6.2	10.0	2.2
Northeastern 18% Creamery Ration.....	21.0	18.0	4.2	3.0	8.7	12.0	9.7
Purina B & M Cow Chow.....	17.8	16.0	4.7	3.5	7.8	10.0	7.5
Purina Broiler Chow.....	21.4	18.0	4.3	3.5	5.4	7.0	5.4
Purina Broiler Chow (Special).....	21.1	18.0	4.7	3.5	3.2	4.0	6.0
Purina Bulky Las.....	18.5	10.0	2.3	2.0	11.0	15.0	12.0
Purina Chick Growena.....	18.7	17.0	4.2	3.0	5.4	7.0	6.8
Purina Chick Growing Chow.....	25.0	23.0	4.1	3.5	7.2	8.0	10.3
Purina Chick Startena.....	21.8	20.0	5.1	3.5	4.2	7.0	6.6
Purina Chicken Fatena.....	16.8	14.0	3.8	3.0	7.3	8.0	3.5
Purina Cow Chow Checkers.....	19.1	18.0	3.7	3.0	8.1	12.0	9.0
Purina Cow Chow Supplement.....	24.9	24.0	4.1	3.0	8.4	11.0	10.5
Purina Dry and Freshening Chow.....	14.2	12.5	3.3	3.0	9.0	14.0	8.9
Purina Eastern Cow Chow.....	22.5	20.0	4.5	3.0	8.0	12.0	7.1
Purina Flushing Mash.....	20.8	18.0	2.8	2.5	5.6	6.0	7.5
Purina Fox Checkers.....	25.2	20.0	4.7	3.0	5.3	6.0	8.5
Purina Goat Chow.....	18.6	16.0	4.5	3.5	6.7	10.0	6.8
Purina Hog Fatena.....	16.8	14.0	3.8	3.0	6.2	8.0	6.2
Purina Layena (Complete Ration).....	17.1	15.5	3.8	3.0	5.9	8.0	10.2
Purina Omolene.....	11.3	10.0	3.5	3.0	7.0	11.0	3.6
Purina Rabbit Chow Checkers (Complete Ration).....	22.4	20.0	4.2	2.0	10.7	18.0	8.5
Purina Turkey Breeder Layena (Complete Ration).....	16.4	16.5	3.7	3.5	5.4	8.0	7.9
Purina Turkey Fatena (Complete Finisher Ration).....	16.9	15.5	4.3	3.5	6.7	7.0	7.5
Purina Turkey Growena.....	22.5	20.0	4.2	3.5	6.7	7.0	7.6
Purina Turkey Startena.....	26.6	24.0	5.2	4.0	6.2	7.0	8.1
41% Protein Soybean Oil Meal.....	44.6	41.0	5.0	3.5	5.8	7.0	5.9
John Reardon & Sons Division of Wilson & Co., Inc. Edible Bone Meal.....	14.9	5.0	5.2	—	—	—	71.6
D. F. Riley Riley's 16% Dairy Ration (2).....	17.6	16.0	4.3	4.5	8.8	10.0	6.6
Riley's 18% Growing Mash.....	18.9	18.0	4.3	4.0	7.0	7.5	8.2
Riley's 18% Laying Mash (2).....	19.8	18.0	4.4	3.5	7.2	7.5	9.5
Russell-Miller Milling Co. Hard Wheat Occident Bran.....	16.9	14.0	5.1	4.0	9.3	11.5	6.3

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Ryther & Warren Co.							
Blue Tag Dairy Ration.....	19.0	17.0	4.6	4.0	9.1	10.0	7.7
Minot Chick Mash.....	19.9	18.0	4.3	4.0	6.0	6.0	8.3
Minot Egg Mash.....	20.0	18.0	4.7	4.0	7.5	8.0	8.7
Minot Growing Mash.....	20.6	18.0	4.3	4.0	7.3	7.0	9.1
Soya Processing Co.							
Wooster Soy Bean Oil Meal (2).....	48.3	44.0	1.0	0.5	5.5	7.0	6.1
A. E. Staley Manufacturing Co.							
Staley's 44% Protein Soybean Oil Meal.....	47.1	44.0	1.1	0.5	5.8	7.0	6.2
Standard Milling Co.							
Hecker's Choice Wheat Bran with ground wheat screenings not exceeding mill run.....	18.1	13.5	5.0	3.5	10.1	13.0	6.7
Jesse C. Stewart Co.							
Red Letter Brand Dried Brewers Grains.....	22.2	24.0	6.4	6.0	15.3	19.0	4.4
Stratton & Co., Inc.							
Wheat Bran.....	14.0	14.0	4.0	4.0	9.6	11.0	5.8
Fancy Fine White Middlings.....	15.3	14.0	4.3	4.0	3.1	5.0	2.8
Wheat Mixed Feed.....	14.6	13.5	4.1	4.0	8.9	8.0	5.5
Suni-Citrus Products Co.							
Sweet Suni-Citrus Pulp.....	6.9	6.0	3.2	4.0	11.9	12.0	5.0
Swift & Co.							
Swift's Broiler Mash.....	21.7	18.0	4.4	4.0	5.6	6.0	7.8
Taunton Grain Co.							
Fitting Ration.....	16.1	14.0	3.7	4.0	6.6	10.0	8.9
Growing Mash.....	20.1	18.0	4.2	4.0	7.5	7.0	9.6
Laying Mash.....	20.1	18.0	4.4	4.0	7.5	7.0	8.8
Winneconnet Turkey Growing.....	20.8	20.0	4.1	4.0	8.4	7.0	8.1
United Co-operative Farmers, Inc.							
UCF All Mash Grower & Layer.....	15.2	15.0	4.5	3.0	7.2	8.0	8.4
UCF Breeder.....	21.0	20.0	5.5	3.0	6.5	8.0	9.1
UCF Fitting Ration.....	14.5	14.0	4.3	3.0	7.9	10.0	7.1
UCF Grower.....	18.8	18.0	5.0	3.0	6.9	8.0	8.9
UCF Layer.....	22.6	20.0	4.8	3.0	7.1	8.0	9.5
UCF Milkmaker.....	19.7	18.0	5.3	3.5	8.2	9.0	7.1
UCF Starter.....	22.0	20.0	5.1	3.0	5.8	7.0	9.6
United Farmers Broiler (Connecticut Formula).....	19.8	20.0	5.3	3.0	2.7	4.0	6.9
United Farmers Super Starter.....	19.8	20.0	4.2	3.0	2.8	4.0	5.6
Unity Feeds, Inc.							
Complete Market Egg Mash.....	18.0	15.0	4.5	3.0	7.4	8.0	8.8
16% Dairy Ration.....	22.2	16.0	5.1	3.0	8.0	10.0	6.9
Fitting Ration.....	14.4	12.0	3.8	3.5	7.4	7.0	7.8
Laying Mash.....	20.4	18.0	4.0	3.0	7.4	8.0	10.6
Paycheck 18% Dairy Ration.....	20.9	18.0	4.3	3.5	10.0	11.0	8.0
Pig & Hog Ration.....	19.6	17.0	4.4	3.0	7.7	8.0	5.5
Scratch Feed (2).....	10.2	10.0	3.3	2.5	3.2	5.0	1.7
18% Test Ration.....	24.0	18.0	5.1	4.0	8.8	10.0	7.4
Arthur Ventura Grain Co.							
Every-day 20% Dairy.....	19.5	20.0	3.6	4.0	7.9	7.0	7.8
Ventura Grower.....	17.1	16.0	4.1	4.0	8.2	7.0	10.8
Wayne County Grangers Feed Corporation							
Superior Complete Growing Mash.....	19.8	16.0	4.2	3.5	6.8	8.0	5.4
Superior Complete Laying Mash.....	18.6	16.0	4.5	3.5	7.2	8.0	5.3
Superior 20% Dairy Feed.....	23.6	20.0	3.5	3.5	10.7	10.0	6.7
Superior Fitting Ration.....	17.6	14.0	3.7	3.5	10.4	9.0	6.6
Superior Growing Mash.....	21.3	18.0	4.5	3.5	7.5	8.0	6.2
Superior Horse Feed.....	13.3	10.0	3.1	3.0	10.2	9.0	5.5
Superior Layer Breeder Mash.....	22.2	20.0	5.1	4.0	7.8	7.5	10.9
Superior Laying Mash.....	19.1	18.0	5.2	3.5	8.6	8.0	5.5
Superior Starting Mash.....	22.2	20.0	4.2	3.5	6.9	7.0	6.3
H. K. Webster Co.							
Blue Seal All-Mash Breeder's Ration.....	19.2	15.0	5.7	3.5	6.0	6.0	7.4
Blue Seal All-Mash Egg Ration.....	17.4	15.0	5.0	3.5	6.7	6.5	7.8

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
H. K. Webster Co., Con.							
Blue Seal All-Mash Growing Ration.....	16.5	15.0	4.7	3.5	6.3	6.5	6.1
Blue Seal Breeder's Mash Pellets.....	23.9	20.0	5.2	3.5	6.7	7.0	9.9
Blue Seal Broiler Mash.....	23.6	24.0	5.2	4.0	5.4	6.5	10.1
Blue Seal Calf Grower.....	14.7	12.0	4.4	3.0	9.0	12.0	7.6
Blue Seal Calf Starter.....	20.0	18.0	4.7	4.0	4.5	5.5	6.3
Blue Seal Chick Starter.....	22.1	19.0	4.2	3.5	5.8	6.5	8.0
Blue Seal "20" Dairy Ration Coarse.....	21.2	20.0	4.8	3.5	7.9	9.0	7.2
Blue Seal Fine "20" Dairy Ration.....	22.6	20.0	4.8	3.5	8.1	9.0	6.1
Blue Seal "16" Dairy Ration Coarse.....	19.0	16.0	4.6	3.5	8.4	9.0	6.0
Blue Seal Fine "16" Dairy Ration.....	18.4	16.0	4.7	3.5	8.5	9.0	7.5
Blue Seal Fattening Pellets.....	15.5	14.0	5.0	3.5	6.4	6.5	6.2
Blue Seal Fitting Ration.....	17.9	14.0	4.1	3.5	8.2	9.0	6.9
Blue Seal Growing Mash (2).....	20.0	20.0	5.5	3.5	6.5	7.0	9.9
Blue Seal Horse Feed.....	11.0	10.0	3.5	3.0	5.4	9.0	4.6
Blue Seal Pig Feed.....	18.5	15.0	5.1	3.0	5.0	6.0	7.2
Blue Seal Rabbit Pellets.....	16.6	14.0	5.5	3.0	8.9	11.0	6.2
Blue Seal Richford Economizer Dairy Ration.....	18.4	16.0	2.6	3.0	14.1	15.0	8.6
Blue Seal Stock Feed.....	12.2	8.5	4.3	3.0	11.3	17.0	6.8
Blue Seal Succulent Feed.....	13.0	10.0	3.1	1.5	14.0	18.0	8.4
Blue Seal Super Mash for Breeders and Layers.....	21.1	20.0	4.4	4.0	3.4	4.0	8.5
Sulfaquinoxaline incorporated in Blue Seal Super Starter and Broiler.....	21.5	20.0	4.6	4.0	3.1	4.0	5.8
Blue Seal Test Ration.....	20.6	18.0	4.5	4.0	8.0	9.0	7.4
Blue Seal Tonic Mash.....	17.4	15.0	5.5	3.5	5.3	6.0	7.9
Blue Seal Turkey Growing (2).....	21.2	20.0	4.7	3.5	6.3	7.0	9.0
Blue Seal Turkey Starter.....	26.1	24.0	5.4	4.0	6.2	7.0	8.5
Stanley Wood Grain Co.							
Bliss Dairy Ration.....	23.5	20.0	4.8	4.0	7.7	10.0	7.4
Preferred Breeder Mash.....	22.8	20.0	4.3	3.5	7.1	7.5	9.0
Preferred Broiler Mash.....	21.4	18.0	4.1	3.5	6.6	7.5	8.0
Preferred Complete Growing Ration.....	16.4	15.5	4.1	4.0	7.0	7.0	7.4
Preferred Complete Laying Ration.....	18.4	16.0	4.3	3.0	6.8	7.5	7.2
Preferred Growing Feed.....	19.9	17.0	4.5	3.5	7.8	7.5	9.7
Preferred Starter Mash.....	20.5	20.0	4.5	3.5	7.0	7.0	8.3
Preferred Turkey Starter & Grower.....	24.5	22.0	4.3	3.0	6.9	7.0	8.9
Wood's 16% Dairy Feed.....	20.7	16.0	4.3	3.5	9.3	10.0	9.1
Wood's Stock Feed.....	14.9	10.0	4.3	3.0	8.2	13.0	5.6
Worcester Grain & Coal Co.							
Just-Right Laying Mash.....	18.0	18.0	4.5	3.5	9.1	9.0	8.3
Yieldmor Feeds, Inc.							
Yieldmor 20% Egg Mash.....	24.4	20.0	3.2	2.7	7.4	7.5	10.5
Yieldmor Growing Mash.....	21.2	18.0	2.5	3.0	6.9	7.0	10.9
Yieldmor Hi Energy Broiler Feed.....	21.9	20.0	3.5	3.0	4.4	6.5	5.8
Yieldmor Sweetened 20% Dairy Feed.....	20.5	20.0	3.0	3.0	8.1	12.0	7.5
Yieldmor 16% Sweet Dairy.....	23.9	16.0	2.6	3.0	8.7	14.0	8.6
Yieldmor Turkey Starter.....	27.6	25.0	4.1	2.5	6.4	6.5	9.2

Brands Not Conforming to Guarantees

This table includes brands that are one percent or more under guarantee in protein or fat or are one and one-half percent or more over guarantee in fiber.

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Allied Mills, Inc.							
Wayne Fox Food Blox.....	23.4	26.0	7.5	4.0	6.6	5.5	9.9
Arcady Farms Milling Co.							
Rockland Rabbit Ration.....	14.2	17.0	2.2	2.5	17.3	16.0	6.2
Barber & Bennett, Inc.							
Ace Dairy Ration.....	18.0	18.0	3.5	3.5	14.4	10.0	5.9
Fort Orange Dry and Freshening Ration.....	16.1	12.0	2.8	3.0	13.6	11.0	8.7
Consolidated Rendering Co.							
Corenco Bone Meal.....	25.3	20.0	0.7	2.0	-	-	64.2
Corenco Fish Meal (a).....	51.4	58.0	17.0	5.0	-	-	21.4
Corenco 45% Meat & Bone Scrap (a).....	41.3	45.0	10.0	6.0	-	-	59.6
Curley Grain & Fuel Co.							
Crystal Complete Laying Mash.....	20.0	16.0	4.2	4.0	8.1	6.0	9.1
Dailey Mills, Inc.							
Dairy Rich 20%.....	20.1	20.0	3.5	4.0	11.4	9.0	10.5
Delaware Mills, Inc.							
Indian Sweet 18% Dairy Feed.....	22.5	18.0	3.2	3.0	14.6	12.0	8.5
Elmore Milling Co., Inc.							
Elmore Calf Grain Ration.....	11.6	13.0	3.2	4.0	5.9	10.0	4.6
Elmore Flaked Pelleted Calf Starter.....	15.9	18.0	4.0	2.5	7.2	8.0	5.1
Elmore Fleshing Pellets.....	20.0	15.0	5.3	4.0	8.3	6.0	10.9
Elmore Stock Feed.....	13.2	10.0	3.5	3.0	13.7	12.0	6.0
Elmore Super Broiler Ration.....	22.9	20.0	5.8	4.0	6.4	4.5	8.4
Elmore Turkey Growing Mash (a).....	21.7	20.0	5.0	4.0	9.7	8.0	9.4
Farm Bureau Association							
Developer Mash (a).....	16.6	18.0	3.7	3.5	5.4	8.0	5.7
Turkey Grower and Finisher.....	12.6	20.0	4.6	3.5	6.0	8.0	6.7
General Foods Corporation, Franklin Baker Division							
Baker's Cooked Babassu Oil Meal.....	24.4	23.0	5.9	5.0	15.0	12.0	6.1
General Mills, Inc., Farm Service Division							
Farm Service Growing Mash.....	21.6	19.0	4.1	3.5	10.7	8.0	10.4
Farm Service Laying Mash.....	21.6	20.0	4.1	3.5	10.6	8.5	10.6
W. K. Gilmore & Sons, Inc.							
Neponset 18% Laying Mash.....	19.6	18.0	3.0	3.0	9.0	6.0	9.8
D. Harbeck & Sons							
Egg Mash.....	17.8	20.0	4.0	4.0	6.1	7.0	9.4
Hood Mills Co.							
Pulverized Hood.....	11.7	12.0	2.8	2.0	15.7	13.0	4.3
Mackenzie & Winslow, Inc.							
Money's Worth Dairy Feed 16%.....	18.4	16.0	4.4	4.0	11.6	10.0	6.3
Geo. Q. Moon & Co., Inc.							
Moon's Rabbit Pellets.....	16.9	15.0	4.4	2.5	12.0	10.0	7.2
Moon's Turkey Grower Mash.....	19.7	20.0	4.8	3.0	9.0	6.5	9.2
Parrish & Heimbecker, Ltd.							
Parrheim Pure Wheat Bran.....	13.8	15.0	4.6	3.5	10.2	11.5	6.3
John Reardon & Sons Division of Wilson & Co., Inc.							
Register Brand 45% Protein Meat and Bone Scrap.....	41.8	45.0	12.3	8.0	-	-	36.8
Register Brand 45% Protein Meat and Bone Scrap.....	42.8	45.0	11.2	8.0	-	-	38.7
Faunton Grain Co.							
Balanced Ration.....	16.8	18.0	3.5	4.0	7.7	10.0	7.7

α See also table of "Brands Substantially Complying with Guarantees".

Brands Not Conforming to Guarantees--Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Arthur Ventura Grain Co.							
Every-Day Dairy	16 9	22.0	3.6	4.5	9 9	8.0	7.8
Every-Day Dairy	20 0	22.0	3.7	4.5	7 8	8.0	8.0
Ventura Laying Mash	17 7	19.0	4.4	5.0	7 9	7.0	10.2
Ventura Laying Mash (b)	18.2	19.0	5.8	5.0	9 6	7.0	12.0
Ventura Starter (b)	17.2	17.0	5.6	4.0	10 4	7.0	11.8
Ventura Starter (b)	18.7	17.0	4.6	4.0	8 2	7.0	12.2
Wayne County Grangers Feed Corporation							
Milkproducer 16% Dairy Feed	20.5	16.0	3.7	3.0	11 7	10.0	6.4
H. K. Webster Co.							
Blue Seal Super Starter and Broiler	17 9	20.0	4.2	4.0	3.2	4.5	6.5
Worcester Grain & Coal Co.							
Just-Right Dairy 18%	17.1	18.0	4.0	4.0	10 5	9.0	6.9

^b See also table of "Poultry Feeds with an Ash Content in Excess of 11 Percent".

Dry Dog Foods

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Albers Milling Co. Friskies Dog Food.....	23.1	24.0	5.2	4.5	3.4	4.0	8.8
Allied Mills, Inc. Wayne Dog Food Krums.....	23.5	22.0	5.7	4.0	4.1	5.0	12.3
Battle Creek Dog Food Co. Miller's Dog Meal.....	23.6	22.0	4.9	4.0	1.9	4.0	10.9
Chas. M. Cox Co. Wirthmore Kibbled Dog Biscuit.....	28.0	26.5	2.8	2.5	2.5	3.0	9.5
Eastern States Farmers' Exchange, Inc. Eastern States Dog Food.....	25.8	24.0	5.0	4.0	2.6	4.5	8.9
John W. Eshelman & Sons Eshelman Red Rose Dog & Puppy Food.....	25.9	23.0	4.9	4.75	4.0	4.0	11.5
General Mills, Inc., Larro Division Larro Dog Food Meal (2) ^a	27.0	24.5	5.2	4.5	5.5	6.0	10.5
Great Atlantic & Pacific Tea Co. Daily Dog Food Kibbled Biscuit.....	22.7	22.0	2.6	3.0	1.0	3.5	3.0
Kasco Mills, Inc. Kasco Complete Dog Ration.....	27.9	25.0	9.9	4.0	4.1	4.0	9.2
Kellogg Co. Gro-Pup Dog Food.....	27.0	22.5	5.5	3.5	3.1	4.0	7.1
Kennel Food Supply Co. Cero Meato Brand Dog Food.....	23.9	21.0	2.0	2.0	2.3	3.0	13.5
Mansfield Milling Co. Full Cry Dog Food.....	23.2	23.0	6.5	5.0	4.5	5.0	13.1
Maritime Milling Co., Inc. Hunt Club Dog Meal.....	25.9	23.0	6.5	3.5	3.7	4.0	10.2
Geo. Q. Moon & Co., Inc. Moon's Dog Food.....	24.5	24.0	5.0	4.0	3.8	4.0	9.4
National Biscuit Co. Milk-Bone Dog Biscuit.....	24.2	21.0	3.0	1.5	1.6	2.5	7.6
Pal Dog Biscuit.....	21.2	18.5	1.5	1.0	1.3	2.5	5.4
Park & Pollard Co., Inc. Munchy Dog Food.....	27.1	26.0	5.6	4.0	2.4	4.5	12.1
Quaker Oats Co. Ken-L Meal.....	26.2	21.0	4.5	2.0	2.6	4.5	8.6
Ralston Purina Co. Purina Dog Chow Kibbled Meal.....	29.6	21.0	4.6	4.0	3.9	6.0	11.1
Sturdy Dog Food Co., Inc. Sturdy Kibble Ration.....	22.0	18.8	2.4	1.05	2.0	1.5	10.5

^a Average analysis of 2 samples.

Poultry Feeds with an Ash Content in Excess of 11 Per Cent

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash	Calcium	Phosphorus	Salt
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed					
Courcy & Sons Grain Co.											
Courcy's Growing Mash.....	18.0	18.0	4.4	4.0	7.9	7.0	13.2	1.20	3.24	1.40	0.74
Courcy's Laying Mash.....	17.7	17.0	4.2	4.0	7.4	8.0	12.5	1.10	3.19	1.31	0.69
Courcy's Laying Mash.....	17.7	17.0	4.2	4.0	7.8	8.0	12.5	0.90	3.15	1.31	0.64
Dietrich & Gambrell, Inc.											
D & G Breeder Mash.....	23.6	22.0	3.5	3.5	5.8	8.0	11.2	1.00	2.53	1.37	1.26
F. Diehl & Son, Inc.											
Diehl's Growing Feed.....	21.4	17.0	4.4	4.0	8.4	8.0	11.2	1.20	2.15	0.98	2.32
East Longmeadow Grain Store											
Blue Ribbon All Mash Layer.....	18.9	15.5	4.8	4.0	5.5	8.0	11.5	1.10	2.79	1.14	0.89
Blue Ribbon Lay Mash.....	21.2	20.0	5.0	4.0	7.4	7.5	11.0	0.90	2.40	1.12	1.26
Eastern States Farmers' Exchange, Inc.											
Eastern States Developer.....	21.1	20.0	3.6	2.5	6.5	8.0	11.7	0.60	2.91	1.39	1.16
Farm Bureau Association											
Conditioner Mash.....	19.6	16.0	4.0	3.5	5.3	6.5	15.6	1.50	4.59	0.94	0.64
Flory Milling Co., Inc.											
Golden Egg Free Range Grower Mash.....	18.1	16.0	4.0	3.0	8.2	8.5	11.9	1.50	2.90	0.90	1.00
Fred A. Fountain											
Fountain's Laying Mash.....	22.4	20.0	4.5	3.5	7.6	7.5	11.7	0.80	2.98	1.50	0.76
General Mills, Inc., Larrowe Division											
Larro Turkey Builder.....	26.9	24.0	3.2	3.5	7.2	8.0	11.2	0.60	2.80	1.20	1.10
Larro Turkey Finisher.....	30.9	27.0	3.0	3.5	6.7	8.0	11.1	0.30	2.80	1.20	1.20
D. H. Grandin Milling Co.											
Grandin's Breeder Mash.....	21.7	20.0	4.0	3.0	7.3	8.0	11.3	0.70	2.86	1.14	1.01
Park & Pollard Co., Inc.											
Lay or Bust Growing Feed.....	20.5	18.0	4.2	2.5	6.0	7.5	12.4	1.00	3.15	0.95	1.23

Alfalfa Meals

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligrams per Pound	Riboflavin Milligrams per Pound
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed			
CarO-Green, Inc.									
Dehydrated Alfalfa Meal.....	{ 17.3 17.8 18.1	{ 17.0 17.0 17.0	{ 2.7 2.3 2.4	{ 1.5 1.5 1.5	{ 27.4 25.7 25.3	{ 28.0 27.0 27.0	{ 8.9 9.6 10.0	{ 30.2 27.3 44.2	{ 5.4 5.0 6.2
Central Mills, Inc.									
Cent-O-Green Dehydrated Alfalfa Meal.....	15.6a	17.0	2.5	1.5	26.0	28.0	8.8	49.2	4.6
Cerophyl Laboratories, Inc.									
Dehydrated Alfalfa Meal.....	17.4	17.0	2.7	1.0	32.2b	27.0	9.4	30.0	4.4
Clark-Stephenson Sales Co.									
17% Dehydrated Alfalfa Meal.....	16.5	17.0	2.4	1.5	30.3b	28.0	8.2	12.7	4.1
Kaw Valley Alfalfa Mill									
Howard's 17% Fine Ground Dehydrated Alfalfa Meal.....	17.7	17.0	2.0	1.75	27.8	27.0	10.7	25.9	9.0
August Moldenhauer Mill									
Dehydrated Alfalfa Meal.....	16.3	17.0	2.6	2.0	27.0	27.0	9.5	16.3	6.7
National Alfalfa Dehydrating & Milling Co.									
17% Protein Dehydrated Alfalfa Pellets.....	18.7	17.0	2.9	1.5	21.5	27.0	10.4	41.7	5.4
Odessa Alfalfa Mills, Inc.									
Alfalfa Meal 20%.....	20.6	20.0	2.3	1.5	23.2	27.0	10.7	52.2	6.4
Schoenck Farms, Inc.									
Schoenck's Super-Green Dehydrated Alfalfa Meal.....	{ 18.8 17.1	{ 17.0 17.0	{ 2.6 2.3	{ 2.0 2.0	{ 24.5 27.7	{ 27.0 27.0	{ 10.0 9.1	{ 32.0 19.1	{ 6.1 4.1
W. J. Small Co., Inc.									
Small's 17% Dehydrated Alfalfa Meal.....	{ 18.2 16.7 17.7 18.2	{ 17.0 17.0 17.0 17.0	{ 2.3 2.5 2.7 2.5	{ 1.75 1.75 1.75 1.5	{ 29.4b 26.2 27.9 29.4b	{ 27.0 27.0 27.0 27.0	{ 8.5 10.8 9.7 8.7	{ 38.1 20.9 36.3 27.0	{ 7.7 6.1 6.1 —
Alfalfa Meal.....	15.5	13.0	1.5	1.5	30.2	33.0	8.8	3.9	6.4

Feed Supplements

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Riboflavin	
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed
Borden Co., Special Products Division									
Ration-ayd Vam Pros.....	39.8	35.0	7.4	1.0	4.6	7.5	9.1	10.7	8.0
Dawe's Manufacturing Co.									
Dawe's Vitamulk Base.....	{36.9	34.0	4.3	3.0	4.8	6.0	6.9	34.3	31.8
	{37.7	34.0	3.5	3.0	5.3	6.0	6.2	33.0	31.8
	32.6	31.0	4.1	2.0	5.9	6.0	7.6	23.8	22.7
Flavonne Ribo-D.....									
Gorton-Pew Fisheries Co., Ltd.	43.0	40.0	10.8	7.5	7.8	7.0	17.3	13.8	14.0
Gorton's All-Fish Blend "Senior"	42.3	40.0	8.2	6.0	7.4	7.0	19.2	13.0	18.0
Gorton's All-Fish Blend "Junior"									
H. P. Hood & Sons									
Powdered Skim Milk.....	31.7	32.0	2.1	0.65	-	-	9.3	8.3	-
Kraft Foods Co.									
Kraco Dried Cheese Whey (Feeding)	12.9	12.0	0.5	0.5	-	-	8.4	8.4	-
Kraylets Livestock Feed Booster	21.2	20.0	6.2	4.5	1.3	3.0	7.9	7.7	-
National Distillers Products Corp.									
Produlac Brand Dried Corn Distillers Grains with Solubles.....	{25.4 ^a	27.0	10.3	8.0	7.2	9.0	4.0	6.1	-
	{27.6	27.0	9.3	8.0	7.3	9.0	4.6	8.4	-
	26.7	27.0	9.8	8.0	7.5	9.0	4.7	5.3	-
Whitmoyer Laboratories, Inc.									
Clo-Meal Vitamin Concentrate.....	{41.1	38.0	19.8	10.0	1.9	3.75	5.7	87.3	70.0
	{42.7	38.0	17.7	10.0	2.6	3.75	7.2	84.6	70.0
	28.6	24.0	20.3	18.0	8.6	10.0	7.1	34.5	25.0
Flav-A-Dec.....	58.2	45.0	11.2	4.0	1.8	5.5	14.8	23.8	20.0

^a Deficient in protein.

Fish Liver Oils and Poultry Vitamin D Supplement

Manufacturer and Brand	Vitamin D A.O.A.C. Chick Units per Gram Guaranteed	Remarks
Dawe's Manufacturing Co. Dawe's Flavonne Ribo-D.....	40	Guarantee sustained
Gorton-Pew Fisheries Co., Ltd. Gorton's Feeding Oil.....	400	Guarantee sustained
Marden-Wild Corp. Fortified Fish Oil..... Cod Liver Oil.....	100 100	Guarantee sustained Guarantee sustained
National Oil Products Co. Nopco XX.....	400	Guarantee sustained
White Laboratories, Inc. Clo-Trate Feeding Oil.....	400	Guarantee sustained
Whitmoyer Laboratories, Inc. Quality Cod Liver Oil Concentrate.....	400	Guarantee sustained

Ground Oats

A continued survey of the quality of ground oats shipped into Massachusetts shows a generally unsatisfactory situation. Although no samples showed the presence of appreciable quantities of limestone or other minerals except sand from screenings, the quality of some lots of ground oats bore little resemblance to the claims on the labels.

The Schafer Oat Products company, particularly, shipped into this State some lots of so-called ground oats that, according to chemical and microscopic examinations, appeared to be mixtures of ground oats, oat mill feed and refuse screenings. The ground oats in some of these mixtures appeared to be a minor ingredient.

It was planned to submit the analytical and shipping data on the seriously deficient samples to the Federal Food and Drug Administration for prosecution. However, it was learned that the company's plant was destroyed by fire and that the company intended to go out of business.

It is becoming obvious that the imposition of penalties in the form of rebates will not succeed in eliminating the questionable practices of some feed manufacturers. In the future, analytical and shipping data will be submitted to the Federal Food and Drug Administration for prosecution in all cases of seriously deficient mixed feeds or feed ingredients shipped into Massachusetts by manufacturers proven to be chronic offenders.

An examination of the table giving analytical and microscopic data on ground oats will show that in some cases, although the chemical analysis indicates the sample to be as represented, microscopic examination proves otherwise. For ground oats, especially, it is planned to place more emphasis on microscopic tests, using standard samples with known amounts of weed seeds and other impurities added, to place these tests on a workable quantitative basis.

An extensive chemical examination was made of two samples of screenings, two samples of mixed feed oats and two samples of ground oats from No. 2 extra heavy oats in an effort to find differences in chemical composition that would be significant. The results obtained are not encouraging.

Preliminary work has been done on a method for extracting the color from various oat products with an organic solvent. Refuse screenings, because of the presence of large amounts of weed seeds and other impurities, give a much deeper color than do ground oats. The difference in density of color can be measured easily. Further work will be done in this direction.

In the table of extensive chemical analysis of ground oats and other products, the sample of Screenings No. 1 is a good grade of grain screenings. In the order of quantity present it is composed of wheat, barley, oats, weed seeds and chaff. Screenings No. 2, also in the order of quantity present, is composed of oat hulls, weed seeds, oat shorts, grain particles (mostly barley) and chaff. This sample apparently is refuse screenings.

Extensive Chemical Analysis Ground Oats and Screenings

	Screenings		Ground Mixed Feed Oats		Ground Oats	
	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2
Protein.....	15.4	11.3	11.5	12.3	12.5	13.2
Fat.....	3.5	4.2	4.7	4.9	4.0	3.9
Fiber.....	7.3	19.0	15.1	14.5	10.3	10.5
Ash.....	3.4	8.5	4.4	4.2	2.9	3.0
Acid insoluble ash (sand).....	—	5.6	—	—	—	—
Phosphorus.....	0.44	0.33	0.36	0.38	0.36	0.37
Calcium.....	0.13	0.48	0.10	0.16	0.08	0.08
Magnesium.....	0.19	0.25	0.16	0.15	0.13	0.13
Potassium.....	0.58	0.63	0.48	0.43	0.36	0.39
Sodium.....	0.0073	0.0067	0.0070	0.0243	0.0053	0.0031
Manganese.....	0.0050	0.0050	0.0050	0.0031	0.0039	0.0031
Iodine number of crude ether extract.....	100.6	95.8	73.8	75.4	88.7	86.3

Ground Oats

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Results of Microscopic Examination
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed			
E. W. Bailey & Co. Ground Oats.....	12.3	—	4.8	—	10.9	—	3.1	—	As represented
Cokato Mill & Elevator Co. Pulverized Oats.....	12.2	11.5	4.2	4.0	11.8	11.5	3.2	—	As represented.
Commander-Larabee Milling Co. Pulverized Oats.....	12.6	—	4.3	—	12.5	—	3.6	—	As represented.
Doughboy Industries, Inc., Milling Division	(13.0 12.7 12.2)	(10.75 10.75 10.75)	(3.5 4.3 3.8)	(3.0 3.0 3.0)	(10.4 13.3 12.5)	(12.0 12.0 12.0)	(3.8 4.8 4.4)	(— — —)	Appears to be ground oats plus screenings. Excessive weed seeds present. Appears to be ground oats plus screenings. Excessive weed seeds present. Appears to be ground oats plus screenings.
John W. Eshelman & Sons Eshelman Red Rose Ground Oats.....	13.3	11.5	5.0	4.5	9.6	12.0	3.9	—	As represented.
Fruen Milling Co. Fruen's Mixers' Pulverized White Oats.....	11.5	10.0	3.5	2.5	12.6	15.0	4.0	—	Appears to be ground mixed feed oats.
General Mills, Inc., Purity Oats Division Pulverized Oats.....	12.7	12.0	4.1	4.5	12.1	13.0	4.4	—	As represented.
LaCrosse Milling Co. Medium Ground White Oats.....	(12.3 12.3)	(11.0 11.0)	(4.5 4.2)	(4.0 4.0)	(12.8 14.0 ^a)	(12.0 12.0)	(4.7 5.0)	(— 3.1)	Excessive weed seeds present. Appears to be ground oats plus screenings. Excessive weed seeds present. Appears to be ground oats plus screenings.
Pulverized White Oats.....	11.6	11.0	4.2	4.0	15.9 ^a	12.75	5.8	3.6	Excessive weed seeds present. Appears to be ground oats plus refuse screenings.

^a Excessive Fiber.

Ground Oats — Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Results of Microscopic Examination
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed			
Ogilvie Flour Mills Co., Ltd. Ground Mixed Feed Oats.....	10.9 ^b	12.0	4.3	4.0	15.6 ^a	12.5	4.4	-	Appears to be a mixture of ground oats and refuse screenings.
St Cloud Milling Co. Pulverized White Oats.....	{ 11.6 12.4 12.5	{ 10.0 10.0 10.0	{ 4.7 3.5 4.8	{ 3.5 3.5 3.5	{ 13.9 12.8 12.5	{ 12.5 12.5 12.5	{ 4.5 3.8 4.2	{ - - -	Appears to contain large amount of screenings. No microscopic examination. Excessive weed seeds present. Appears to be no better than sample grade oats.
Schaefer Oat Products Big-S Medium Ground Oats.....	9.1 ^b	11.0	3.1	3.25	20.5 ^a	12.75	5.3	3.5	Appears to be mixture of ground oats, oat mill feed and refuse screenings.
Big-S Pulverized White Oats.....	{ 9.5 ^b 11.3 12.1	{ 11.0 11.0 11.0	{ 2.6 3.3 3.8	{ 3.25 3.25 3.25	{ 20.4 ^a 17.6 ^a 13.9	{ 12.75 12.75 12.75	{ 5.0 6.9 6.6	{ 2.9 4.2 4.4	Appears to be mixture of ground oats and oat mill feed.
	{ 12.4 12.8 11.9	{ 11.0 11.0 11.0	{ 3.6 4.4 3.6	{ 3.25 3.25 3.25	{ 14.8 ^a 11.8 14.0 ^a	{ 12.75 12.75 12.75	{ 5.8 5.8 6.3	{ 3.6 3.7 4.0	Appears to be mixture of ground oats and refuse screenings.
	{ 12.3 12.2	{ 10.0 10.0	{ 3.5 4.8	{ 3.0 3.0	{ 13.8 14.0	{ 14.5 14.5	{ 8.4 7.6	{ 5.3 4.9	Appears to be mixture of ground oats and refuse screenings.
	12.2	-	4.1	-	12.6	-	3.6	-	As represented.
H. K. Webster Co. Blue Seal Ground Oats.....									

^a Excessive Fiber.^b Protein deficient.

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FEEDINGSTUFFS
FOR SALE IN MASSACHUSETTS IN 1949**

- Acme-Evans Co., Inc., 902 West Washington Ave., Indianapolis 9, Ind.
Albers Milling Co., 6130 Avalon Blvd., Los Angeles 3, Cal.
Allied Mills, Inc., Chicago, Ill.
American Maize-Products Co., 103 East 42nd St., New York 17, N. Y.
Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago 6, Ill.
Archer-Daniels-Midland Co., Minneapolis 2, Minn.
Ashcraft-Wilkinson Co., 601 Trust Co. of Georgia Bldg., Atlanta, Ga.
- E. W. Bailey & Co., Montpelier, Vt.
Bannock Food Co., Inc., West Chester, Penn.
Barber & Bennett, Inc., Albany, N. Y.
Battle Creek Dog Food Co., 60 East State St., Battle Creek, Mich.
Bay State Milling Co., Winona, Minn.
Beacon Milling Co., Inc., Cayuga, N. Y.
Best Foods, Inc., 1442 Marine Trust Bldg., Buffalo, N. Y.
Black Rock Milling Corp., 356 Hertel Ave., Buffalo 7, N. Y.
Blatchford Calf Meal Co., Waukegan, Ill.
Blatchley & Ballard, Inc., Middletown, Conn.
Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
Borden Grain Co., 700 West Water St., Taunton, Mass.
Borden's Soy Processing Co., Division of the Borden Company, Kankakee, Ill.
Brown-Forman Distillers Corp., 1908 Howard St., Louisville, Ky.
George B. Brown Corp., Ipswich, Mass.
Buckeye Cotton Oil Co., Cincinnati, Ohio
- Canada Linseed Oil Mills, Ltd., Montreal, Canada
A. B. Caple Co., Toledo 5, Ohio
Cargill, Inc., 200 Grain Exchange, Minneapolis, Minn.
CarO-Green, Inc., 328 Board of Trade Bldg., Kansas City, Mo.
Central Soya Co., Inc., Fort Wayne, Ind.
Clark-Stephenson Sales Co., Winfield, Kan.
Clinton Industries, Inc., Clinton, Iowa
Coatsworth and Cooper, Ltd., 67 Yonge St., Toronto, Ont., Canada
Commander-Larabee Milling Co., Minneapolis, Minn.
Community Service, Inc., Canaan, Conn.
Consolidated Products Co., Danville, Ill.
Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
Corn Products Refining Co., 17 Battery Place, New York 4, N. Y.
Coulter Dog Food Co., 22 Alden St., Fitchburg, Mass.
Courcy & Sons Grain Co., Taunton, Mass.
Cover Grain & Feed Co., Lowell, Mass.
Chas. M. Cox Co., 177 Milk St., Boston 9, Mass.
Crawford Brothers, Inc., Waiton, N. Y.
Curley Grain & Fuel Co., Wakefield, Mass.
- Dailey Mills, Inc., Olean, N. Y.
Dawe's Manufacturing Co., 4800 South Richmond St., Chicago 32, Ill.
Decatur Milling Co., Inc., Decatur, Ill.
Dehydrating Process Co., 10 High St., Boston 10, Mass.
Delaware Mills, Inc., Deposit, N. Y.
Delphos Grain & Soya Products Co., 201 South Jefferson St., Delphos, Ohio
Derwood Mill, Inc., Derwood, Md.
Frank Diauto, Randolph, Mass.
F. Diehl & Son, Inc., Wellesley 81, Mass.
Dietrich & Gambrill, Inc., Frederick, Md.
Drackett Products Co., Cincinnati 32, Ohio
J. L. Dunnell & Son, Bernardston, Mass.
E. I. du Pont de Nemours & Co., Wilmington 98, Del.
- Eagle Roller Mill Co., New Ulm, Minn.
East Longmeadow Grain Store, East Longmeadow, Mass.
Eastern States Farmers' Exchange, Inc., West Springfield, Mass.
B. A. Eckhart Milling Co., 1300 West Carroll Ave., Chicago 7, Ill.
Elk Valley Alfalfa Mills, a Division of Midland Industries, Inc., Independence, Kan.
Elmore Milling Co., Inc., Oneonta, N. Y.

John W. Eshelman & Sons, Lancaster, Penn.
Essex County Co-operative Farming Assn., Topsfield, Mass.
Excelcior Milling Co., Minneapolis, Minn.

Farm Bureau Assn., 155 Lexington St., Waltham 54, Mass.
Farmers Feed Co., 532 East 76th St., New York, N. Y.
Federal Mill, Inc., Lockport, N. Y.
Feed Products, Inc., Groveland, Florida
Ferneau Grain Co., Blanchester, Ohio
First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
Flory Milling Co., Inc., Bangor, Penn.
Fred A. Fountain, Taunton, Mass.

Gateway Milling Assn., Inc., Dart at Letchworth Streets Buffalo 13, N. Y.
General Foods Corp., 250 Park Ave., New York 17, N. Y.
General Foods Corp., Aberjona Division, 209 New Boston St., Woburn, Mass.
General Foods Corp., Corn Mill Division, Kankakee, Ill.
General Foods Corp., Post Cereals Division, Battle Creek, Mich.
General Mills, Inc., Minneapolis, Minn.
General Mills, Inc., Farm Service Division, 675 Main St., Waltham, Mass.
General Mills, Inc., Larowe Division, Detroit 2, Mich.
Gerard Co., 4101 East Monument St., Baltimore 5, Md.
W. K. Gilmore & Sons, Inc., Walpole, Mass.
Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis 6, Ind.
Glidden Co., Soya Products Division, 5165 West Moffat St., Chicago 39, Ill.
Gorton-Pew Fisheries Co., Ltd., Gloucester, Mass.
D. H. Grandin Milling Co., Jamestown, N. Y.
Great Atlantic & Pacific Tea Co., New York, N. Y.

Hales & Hunter Co., 141 West Jackson Blvd., Chicago 4, Ill.
D. Harbeck & Sons, New Bedford, Mass.
Harper Feed Mills, Inc., Washington, Penn.
Hercules Powder Co., Dairy Products Division, 821 Marquette St., Minneapolis, 2, Minn.
H. P. Hood & Sons, Inc., 500 Rutherford Ave., Boston 29, Mass.
Hood Mills Co., 4101 East Monument St., Baltimore 5, Md.
E. C. & W. L. Hopkins, Inc., Greenfield, N. H.
J. William Horsey Corp., Plant City, Florida
Hubinger Co., Keokuk, Iowa
Humphreys-Godwin Co., Memphis, Tenn.

Illinois Cereal Mills, Inc., Paris, Ill.
Illinois Yeast Co., Princeton, Ill.
Independent Tallow Co., Inc., 39 Cedar St., Woburn, Mass.
International Milling Co., Minneapolis, Minn.

Jaquith & Co., 305 Main St., Woburn, Mass.
Juice Industries, Inc., Dunedin, Florida

Kansas Flour Mills Co. (Trade Name) of Flour Mills of America, Inc., Kansas City 13, Mo.
Kasco Mills, Inc., Waverly, N. Y.
Kellogg Co., Battle Creek, Mich.
Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
Kennel Food Supply Co., Inc., 63 Mill Hill Terrace, Fairfield, Conn.
H. H. King Flour Mills Co., Minneapolis, Minn.
H. C. Knoke & Co., 5728 West Roosevelt Rd., Chicago 50, Ill.
Kraft Foods Co., 40 Worth St., New York 13, N. Y.
Chas. A. Krause Milling Co., Milwaukee 1, Wis.
Kronick's Coal & Grain Co., Adams, Mass.
Kuder Citrus Pulp Co., Lake Alfred, Florida

Larabee Flour Mills Co., 20 West Ninth St., Kansas City 6, Mo.
Lauhoff Grain Co., Danville, Ill.
Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.
L. B. Lovitt & Co., Memphis, Tenn.

Mackenzie & Winslow, Inc., Fall River, Mass.
Maine Fish Meal Co., Union Wharf, Portland, Maine
Mansfield Milling Co., Mansfield, Mass.
Marianna Sales Co., Memphis, Tenn.

- Maritime Milling Co., Inc., Buffalo 2, N. Y.
Merrimack Farmers' Exchange, Inc., Concord, N. H.
Methuen Grain Co., Inc., Methuen, Mass.
Miner-Hillard Milling Co., Wilkes-Barre, Penn.
Geo. Q. Moon & Co., Inc., Binghamton, N. Y.
Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.
Morton Salt Co., 120 South La Salle St., Chicago 3, Ill.
Mount Vernon Milling Co., Division of J. R. Short Milling Co., Mount Vernon, Ind.
- National Alfalfa Dehydrating & Milling Co., Lama, Col.
National Biscuit Co., 449 West 14th St., New York 14, N. Y.
National Biscuit Co., Toledo Mill, 2221 Front St., Toledo, Ohio
National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
Near's Food Co., Inc., 115 Montgomery St., Binghamton, N. Y.
New Bedford Fish Products Corp., New Bedford, Mass.
New Bedford Grain Co., New Bedford, Mass.
Northwest Linseed Division of Falk & Co., Inc., Minneapolis, Minn.
- P. Fred'k Obrecht & Son, 4101 East Monument St., Baltimore 5, Md.
Ogden Grain Co., Utica, N. Y.
Oeilvie Flour Mills Co., Ltd., Montreal, Que., Canada
Old Trusty Dog Food Co., Inc., 278 West St., Needham Heights 94, Mass.
Omar, Inc., Omaha, Neb.
Oswego Soy Products Corp., Oswego, N. Y.
- Palm Grain Co., 1081 Gorham St., Lowell, Mass.
Park & Pollard Co., Inc., 356 Hertel Ave., Buffalo 7, N. Y.
George H. Parker Grain Co., Danvers, Mass.
Pasco Packing Co., Dade City, Florida
Patent Cereals Co., Geneva, N. Y.
Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa
Pillsbury Mills, Inc., Minneapolis 2, Minn.
Pilgrim Feed Co., 22 Savoy Street, Providence, R. I.
Pittsford Flour Mills, Inc., Schoen Place, Pittsford, N. Y.
Plymouth Citrus Growers Assn., Plymouth, Florida
R. C. Pratt, 18 Toronto St., Toronto, Ont., Canada
- Quaker Oats Co., 141 West Jackson Blvd., Chicago 4, Ill.
- Ralston Purina Co., St. Louis, Mo.
John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
D. F. Riley, North Hatfield, Mass.
Riverside Elevator Co., Detroit, Mich.
Rodney Milling Co., Kansas City 8, Mo.
Russell-Miller Milling Co., 900 Midland Bank Bldg., Minneapolis 1, Minn.
Ryther & Warren Co., Belchertown, Mass.
- Saunders Mills, Inc., Toledo, Ohio
Schenley Distilleries, Inc., 350 Fifth Ave., New York 1, N. Y.
Schoeneck Farms, Inc., Nazareth, Penn.
Sea Board Supply Co., 35th St. & Gray's Ferry Ave., Philadelphia 46, Penn.
Joseph E. Seagram & Sons, Inc., Louisville 1, Ky.
Security Food Co., 521 South Third St., Minneapolis 15, Minn.
Shellabarger's, Inc., 511 North Santa Fe St., Salina, Kan.
Shellabarger Mills, Inc., Decatur, Ill.
Sherwin Williams Co., Cleveland, Ohio
W. J. Small Co., Inc., Kansas City 6, Mo.
Allen V. Smith, Inc., Marcellus Falls, N. Y.
A. E. Staley Manufacturing Co., Decatur, Ill.
Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
Stratton & Co., Inc., Penacook, N. H.
Suni-Citrus Products Co., Atlanta, Ga.
Sunshine Biscuits, Inc., Milling Division, Grafton, Ohio
Swift & Co., Union Stock Yards, Chicago 9, Ill.
- Taunton Grain Co., Taunton, Mass.
Tioga Mills, Inc., Waverly, N. Y.
Toledo Soybean Products Co., Toledo, Ohio

Union Starch & Refining Co., Columbus, Ind.
United Cooperative Farmers, Inc., Fitchburg, Mass.
United Distillers of America, Inc., 350 Fifth Ave., New York, N. Y.
United Farmers of New England, Inc., Charlestown, Mass.
Unity Feeds, Inc., 177 Milk St., Boston 9, Mass.
Universal Grain Co. of New Jersey, 425 South St., Newark, N. J.
George Urban Milling Co., 332 North Oak St., Buffalo, N. Y.

Vacuum Foods Corp., Leesburg, Florida
Valier & Spies Milling Co. (Trade Name) of Flour Mills of America, Inc., St. Louis, Mo.
Van Iderstine Co., Long Island City, N. Y.
Arthur Ventura Grain Co., Taunton, Mass.
Vita-Vim Millers, 135 Scott St., Buffalo, N. Y.

Hiram Walker & Sons, Inc., Peoria, Ill.
C. P. Washburn Co., Middleboro, Mass.
Wayne County Grangers Fed Corp., Clyde, N. Y.
H. K. Webster Co., Lawrence, Mass.
Western Condensing Co., Petaluma, Cal.
Western Condensing Co., 935 East John St., Appleton, Wis.
Whitmoyer Laboratories, Inc., Myerstown, Penn.
Stanley Wood Grain Co., Taunton, Mass.
Worcester Grain & Coal Co., Worcester, Mass.
Worcester Salt Company, a Division of Morton Salt Co., New York 13, N. Y.

Yieldmor Feeds, Inc., Piqua, Ohio

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 141

JULY, 1949

**Twenty-ninth Annual Report of
Pullorum Disease Eradication
in Massachusetts**

By the Poultry Disease Control Laboratory

During the 1948-49 testing season 569 chicken, turkey, and pheasant flocks were tested. A total of 1,241,500 samples was tested, of which only 0.04 percent were positive. This is the lowest percentage of positive tests for the twenty-nine years of testing. The percentage (1.55) of pullorum "breaks" in the negative flocks was the lowest for the past 10 years. Furthermore 99.1 percent of all the birds tested were located in 100 percent tested, non-reacting flocks. Massachusetts flock owners are to be complimented on the progress that is being made in establishing and maintaining pullorum-free flocks.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

TWENTY-NINTH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1948-49

By the Poultry Disease Control Laboratory¹

INTRODUCTION

The pullorum testing results for 1948-49 continue to show progress in pullorum disease eradication in Massachusetts. The volume of testing work was slightly less than that of the previous season. The average percentage of positive tests was 0.04 which is the lowest in the testing history of Massachusetts. Likewise the percentage of pullorum "breaks" in previous non-reacting flocks was the lowest for the past ten years of testing. Furthermore 99.1 percent of all the birds tested were in 100 percent tested non-reacting flocks. These results show that pullorum disease eradication is making definite progress in Massachusetts.

During the past year the testing operations were carried out with few difficulties, and the flocks for the most part were tested at a time requested by the flock owners. It is hoped that the close co-operation existing among the flock owners, laboratory, and other agencies may continue in order to carry out an effective program.

We also wish to express our appreciation for the assistance given by the Extension Service, the Massachusetts Department of Agriculture, and other agencies in making this program a success.

SUMMARY OF SERVICE RENDERED

Applications received.....	584
Applications cancelled.....	15
Flocks tested.....	569
Chicken flocks.....	458
Turkey flocks.....	82
Pheasant flocks.....	29
Number of tests.....	1,241,500
Chickens:	
Routine.....	1,196,844
Experimental.....	16,229
Fowl other than chickens:	
Routine.....	28,368
Experimental.....	59
Owners receiving necropsy service.....	39
Necropsies of reacting birds.....	81

DISTRIBUTION OF TESTS AND REACTORS

Table 1 gives the number of tests and reactors by breed and county. A total of 1,213,073 samples was received from chicken flocks in 12 counties. The per-

¹ H. Van Roekel, Research Professor in Charge; K. L. Bullis and G. H. Snoeyenbos, Research Professors; O. S. Flint, F. G. Sperling, and Miriam K. Clarke, Assistant Research Professors; O. M. Olesiuk, A. M. Crotty, and S. M. O'Grady, Research Assistants. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

centage of positive tests was 0.04. Middlesex, Plymouth, and Worcester Counties led in the number of samples tested. No reactors were found among tested birds in Barnstable, Dukes, Franklin, Hampshire, and Plymouth Counties.

The following breeds were tested: Bantam, Barnevelder, Barred Plymouth Rock, Brahma, Columbian, Crosses, Delaware, Eisenbar, New Hampshire, Rhode Island Red, White American, White Cornish, White Plymouth Rock, Wyandottes (Buff, Golden, Silver Laced, White).

The Rhode Island Red, New Hampshire, and the Barred Plymouth Rock were the predominating breeds. Of the total samples 46.58 percent were taken from Rhode Island Red, 24.61 percent from New Hampshire, 22.09 percent from the Barred Plymouth Rock, and the balance from the other breeds listed.

Of the 1,101,743 samples collected from females, 50,355 were from hens and 1,051,388 from pullets, with 0.53 and 0.015 percent reactors, respectively. The 111,330 samples collected from males gave 0.007 percent positive tests.

ANNUAL TESTING OF FLOCKS

Table 2 gives the results from flocks tested for the first time, intermittently for two consecutive years, and for three or more consecutive years.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time	43	55,922	58,003	329	0.57	33	6	4	-
Intermittent testing	29	38,177	38,281	3	0.007	27	2	-	-
Two consecutive years	31	61,411	61,411	2	0.003	28	2	1	0
Three or more consecutive years	355	1,023,971	1,055,378	109	0.01	351	3	-	1
TOTALS	458	1,179,481	1,213,073	443	0.04	439	13	5	1

In the first-year group there were 43 flocks, representing 58,003 tests of which 0.57 percent were positive. In this group 39 flocks, containing 95.51 percent of the birds, were non-reacting and four flocks were positive. The average number of birds per flock was 1,300.

In the group tested intermittently there were 29 flocks, representing 38,281 tests. Only three reactors (0.007 percent) were detected. All the flocks were classified as non-reacting at the end of the season. The average number of birds per flock was 1,316.

In the group tested for two consecutive years there were 31 flocks, representing 61,411 tests. Thirty flocks were non-reacting, representing 91.38 percent of the birds tested in this group. The average number of birds per flock was 1,981.

In the group tested for three or more consecutive years there were 355 flocks, representing 1,055,378 tests. The average percentage of positive tests was 0.01. A total of 354 non-reacting flocks was detected which contained 99.96 percent of the birds tested in this group. The average number of birds per flock was 2,884.

For the four groups as a whole 458 flocks were tested, representing 1,179,481 birds and 1,213,073 samples, of which 0.04 percent were positive. The 439 flocks which were 100 percent tested and non-reacting contained 1,161,599 birds or 99.1 percent of the total birds tested. Six flocks were classified as positive, representing 8,118 birds. The average percentage of reactors among these birds was 0.71. These results show that the amount of pullorum infection has been reduced to a very low level.

During the past year 108 or 21.86 percent of the flocks tested in 1947-48 were not tested this season. This is a smaller number of flocks than dropped out the previous season. However, progress in pullorum disease eradication is greatly influenced by annual testing of flocks. Intermittent testing may permit infection to become well established, consequently making it more difficult and costly to re-establish a pullorum-clean flock. Flock owners are urged to test their flocks annually in order to determine the true pullorum status of the birds. By adopting such a program along with other effective eradication measures, flock owners are likely to succeed in developing pullorum-clean flocks.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

During the past year reactors were found in six flocks which had been non-reacting the previous year. The testing results of these flocks are given in Table 3. Three flocks had been negative for one year, two flocks for five years, and one flock for eight years. Five flocks had less than 1 percent infection. In flocks 3, 4, and 6 entire infected pens of birds were sold immediately after infection was detected. All six flocks were retested and no additional infection was detected in the mature birds.

Table 3. Appearance of Infection in Flocks Previously Negative

Flock	Number of Years Negative	1948-49 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	5	1,950	1,950	0.05	Unknown
		1,932	1,932*	0.00	
2	5	7,281	7,281	0.10	Unknown
		7,281	210*	0.00	
		3,099	3,099*	0.00	
3	1	3,840	3,840	0.83	Questionable stock
		3,840	1,942*	0.00	
		6,000	1,894*	0.00	
		6,000	1,449*	0.00	
		5,130	1,681*	0.00	
5,000	1,740*	0.00			
4	8	3,461	3,461	1.04	Questionable stock
		2,718	2,718*	0.00	
5	1	594	594	0.51	Unknown
		575	575*	0.00	
		556	556*	0.00	
6	1	8,387	8,387	0.05	Unknown
		4,268	4,268*	0.00	

*Represents retests

The source of the infection was unknown in four flocks. In the other two flocks, it was believed that the purchase of questionable stock was the source of infection. The incidence of the "breaks" for this past season was much less than that of the previous season, 6 and 16 respectively. In fact it is the lowest percentage of "breaks" during the past 10 years. The following summary gives the incidence of "breaks" among Massachusetts tested flocks for the past 10 years.

Year	Number of Flocks	Breaks		Flocks with less than 0.5 percent infection on first test	
		Number	Percent	Number	Percent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	50.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94
1948	425	16	3.76	13	81.25
1949	386	6	1.55	3	50.00

These results are very encouraging. Flock owners and hatcherymen are urged to exercise every possible precaution against the spread and introduction of infection. Only through such a concerted effort will pullorum "breaks" be kept at a low level.

The following measures have been found to be effective for establishing and maintaining a pullorum-free flock.

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are re-admitted into the flock.
7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult the Massachusetts Department of Agriculture, 41 Tremont Street, Boston, regarding additions or replacements in your flock.
8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom-hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING OF FOWL OTHER THAN CHICKENS

During the past year 28,427 fowl other than chickens were tested, including 21,231 turkeys, 4,959 pheasants, 2,022 quail, 150 geese, 50 ducks, 3 pigeons, 9 chukars, and 3 pea fowl. No pullorum infection was detected.

The majority of turkey flocks contained less than 500 birds. The following summary gives the range in flock sizes for the turkey flocks tested.

Size of Flock	Number of Flocks
0 - 50	21
51 - 100	13
101 - 150	11
151 - 200	5
201 - 500	20
501 - 1000	9
1001 - 2000	2
2001 +	1

For the last two successive years, no pullorum infection has been detected in fowl other than chickens. Flock owners are advised to continue their vigilance against the introduction of pullorum disease.

NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4 the non-reacting and positive flocks are listed by counties. A total of 452 non-reacting flocks, representing 1,171,363 birds, was detected in 12 counties. Among the 452 non-reacting flocks, 439 were 100 percent tested, representing 1,161,599 birds; whereas 13 flocks were partially tested and contained 9,764 birds. In Barnstable, Dukes, Essex, Hampden, and Plymouth Counties, all the non-reacting flocks were 100 percent tested.

Six flocks, representing 8,118 birds, were classified as positive at the close of the testing season. Of the six flocks, five were 100 percent tested and one was partially tested. The number of positive flocks and birds in such flocks is considerably less than in the previous season. It is encouraging to note that the number of infected flocks is declining. When infected flocks are detected, definite plans should be adopted whereby the infection can be eradicated in the shortest

possible time. The establishment of pullorum-clean flocks in Massachusetts today can usually be accomplished with definite assurance, and any flock owner who knows that his flock is infected should make every effort possible to eradicate the infection.

Table 4. Non-reacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Total	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Non-reacting Flocks						
Barnstable.....	4	24,630	—	—	4	24,630
Berkshire.....	8	39,677	1	760	9	40,437
Bristol.....	60	136,431	2	2,434	62	138,865
Dukes.....	1	3,902	—	—	1	3,902
Essex.....	52	134,789	—	—	52	134,789
Franklin.....	24	36,842	1	998	25	37,840
Hampden.....	14	18,523	—	—	14	18,523
Hampshire.....	25	39,383	1	869	26	40,252
Middlesex.....	79	217,132	3	1,813	82	218,945
Norfolk.....	41	131,927	2	1,691	43	133,618
Plymouth.....	64	200,555	—	—	64	200,555
Worcester.....	67	177,808	3	1,199	70	179,007
Totals...	439	1,161,599	13	9,764	452	1,171,363
Positive Flocks						
Bristol.....	1	730	1	317	2	1,047
Essex.....	3	7,065	—	—	3	7,065
Middlesex.....	1	6	—	—	1	6
Totals...	5	7,801	1	317	6	8,118

COMPARISON OF 1947-48 AND 1948-49 TESTING

Table 5 gives a comparison of testing results for the 1947-48 and 1948-49 seasons. In three counties (Barnstable, Berkshire, and Franklin) there was an increase in the number of tested flocks. In the other counties, either the same number or fewer flocks were tested. An increase in the number of tested birds was observed for Berkshire, Franklin, Middlesex, and Plymouth Counties. In five counties no reactors were detected among tested birds as compared with three the previous season. The average percentage of reactors was reduced from 0.10 to 0.04.

Table 5. Comparison of 1947-48 and 1948-49 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1947-48 Season					
Barnstable.....	3	25,630	25,630	0.00	3
Berkshire.....	7	25,417	29,314	0.16	5
Bristol.....	75	145,764	156,440	0.14	71
Dukes.....	1	4,243	4,243	0.00	1
Essex.....	64	148,305	148,305	0.05	61
Franklin.....	20	36,924	37,945	0.002	20
Hampden.....	23	31,040	31,644	1.24	21
Hampshire.....	28	43,907	43,907	0.00	28
Middlesex.....	84	214,444	219,968	0.14	80
Norfolk.....	44	165,430	169,206	0.02	43
Plymouth.....	70	190,775	208,359	0.008	70
Worcester.....	75	188,078	197,586	0.10	73
Totals.....	494	1,219,957	1,272,547	0.10	476
1948-49 Season					
Barnstable.....	4	24,630	24,630	0.00	4
Berkshire.....	9	40,437	42,730	0.04	9
Bristol.....	64	139,912	141,779	0.004	62
Dukes.....	1	3,902	3,902	0.00	1
Essex.....	55	141,854	146,122	0.04	52
Franklin.....	25	37,840	38,014	0.00	25
Hampden.....	14	18,523	18,627	0.02	14
Hampshire.....	26	40,252	40,252	0.00	26
Middlesex.....	83	218,951	233,255	0.14	82
Norfolk.....	43	133,618	134,820	0.002	43
Plymouth.....	64	200,555	200,582	0.00	64
Worcester.....	70	179,007	188,360	0.02	70
Totals.....	458	1,179,481	1,213,073	0.04	452

TWENTY-NINE YEAR TESTING SUMMARY

Table 6 gives a twenty-nine year testing summary. The average percentage of reactors for 1948-49 is the lowest in the twenty-nine year period. Furthermore, the percentage (99.31) of total birds tested which are located in non-reacting flocks is the highest on record for Massachusetts. While there have been decreases in the number of flocks, birds, and samples tested, the general picture reveals that Massachusetts flock owners are making progress in establishing and maintaining a poultry industry which is relatively free of pullorum disease.

Table 6. Twenty-Nine Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19
1947-48	494	1,219,957	1,272,547	0.10	476	1,185,852	97.20
1948-49	458	1,179,481	1,213,073	0.04	452	1,171,363	99.31

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: During the past year 108 flocks, which were tested in 1947-48, dropped out of the testing program. Some of these flocks were liquidated and others were not used for the purpose of producing hatching eggs. It is realized that one should not expect a flock owner to test his flock if he does not plan to produce hatching eggs. However, it should be emphasized that a flock of this type should be carefully protected against the possible introduction of pullorum infection. The "in and out" flocks can be safeguarded against pullorum infection through careful vigilance in keeping out pullorum disease, and by replacing untested birds with pullorum-clean stock. If such precautions are taken, the owner has reasonable assurance that his flock will be found free from infection when tested for the purpose of producing hatching eggs.

During the past year 14 flocks, representing 10,081 birds, were partially tested. As has been pointed out in the past, partial flock testing does not determine the true pullorum status of all the birds on the premises. It is hoped that sometime all flocks will be 100 percent tested so that if no reactors are de-

tected, the flocks may be officially recognized by the Massachusetts Department of Agriculture and classified in either of the two official grades, Pullorum Passed or Pullorum Clean.

Early Testing: Special mention should be made regarding the splendid cooperation received from the flock owners in testing part or all of their flocks early. Early testing during the summer months has permitted the laboratory to cope with the volume of testing during the peak work months of October, November, and December.

Months	Number of Tests
April.....	10,359
May.....	16,307
June.....	65,540
July.....	90,896
August.....	112,210
September.....	154,806
October.....	174,164
November.....	192,299
December.....	179,401
January.....	147,739
February.....	71,267
March.....	22,829
April, 1949.....	3,683
Total.....	1,241,500

This past season approximately 450,000 tests were completed by October 1 and approximately 996,000 by January 1. The testing of birds as soon as they are five months of age has helped to level the pullorum testing peak from October to January 1. Of greater importance, however, is it that untested birds are not used for the production of hatching eggs.

Applications for the 1949-50 season were sent out in April to all flock owners who had pullorum testing this past year. These applications should be filed early because they are serviced in order of receipt unless circumstances suggest otherwise. It should be strongly emphasized that in order to service application cards, the flock owner should submit sufficient money to cover the testing of the flock before the blood collector can be scheduled for the collection of the samples. Again it should be mentioned that flock owners should not expect short-notice service. Payment should be sent to the Treasurer of the University of Massachusetts.

Fullest cooperation between the laboratory and the flock owner should make it possible to give best service available under existing circumstances.

PUBLICATION OF THIS DOCUMENT APPROVED BY STATE PURCHASING AGENT.
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MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 142

JULY 1949

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventy-sixth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261 inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1949

By Fertilizer Control Service Staff

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Assistant Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
W. Noel Jameson, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesia.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1.

Tonnage fee: 6 cents per ton of 2,000 pounds

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

FERTILIZER TONNAGE
Tonnage of Fertilizer Sold in Massachusetts

	1947		1948	
	Jan. 1 to July 1	July 1 to Dec. 31	Jan. 1 to July 1	July 1 to Dec. 31
Mixed fertilizers.....	57,983	6,335	58,560	8,583
Fertilizer chemicals and materials unmixed.....	9,384	3,332	9,238	3,529
Pulverized animal manures.....	1,272	256	1,322	401
Totals.....	68,639	9,923	69,120	12,513

Tonnage of Mixed Fertilizers, January 1 to December 31, 1948

Grade*	Tonnage		Brands	Grade*	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31			Jan. 1 to July 1	July 1 to Dec. 31	
5-10-10	14,702	1,244	20	3-12-12	315	295	—
5-8-7	13,060	1,218	16	5-10-3	207	245	—
6-3-6	9,517	254	10	8-7-3	180	160	—
7-7-7	6,517	1,767	12	0-20-20	111	33	—
4-12-4	3,207	496	12	6-5-5	109	—	—
5-10-5	2,903	243	20	5-15-15	95	45	—
8-16-16	1,844	174	6	5-3-5	94	—	—
3-12-6	849	12	—	10-20-0	62	—	—
10-10-10	802	361	—	6-8-6	43	54	—
0-14-14	745	1,175	8	4-10-0	39	—	—
5-15-10	704	160	—	5-8-5	30	6	—
8-6-2	413	85	5	7-11-5	29	39	—
4-12-8	395	80	6	4-8-4	29	17	—
8-6-4	387	147	5	0-19-19	18	35	—
8-4-8	373	3	—	6-7-4	13	—	—
6-10-4	363	89	—	7-8-5	11	—	—
4-12-16	360	114	—	Miscellaneous	34	32	24
				Totals.....	58,560	8,583	167

* The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1 to December 31, 1949

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Superphosphate.....	2,597	1,381	8
Nitrate of soda.....	2,508	756	—
Process tankage and activated sewage	1,718	695	—
Pulverized animal manures.....	1,322	401	26
Cottonseed meal.....	700	252	—
Bone meal.....	622	137	12
Muriate of potash.....	419	222	—
Cyanamid.....	212	17	—
Castor pomace.....	129	14	—
Sulfate of ammonia.....	108	—	—
Dry ground fish.....	89	—	—
Ammonium nitrate.....	59	9	—
Rock phosphate.....	40	40	—
Miscellaneous.....	37	6	—
TOTALS.....	10,560	3,930	71

MIXED FERTILIZERS
Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With no Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
American Agricultural Chemical Co.	26	12	77	12	3	0	0
Apothecaries Hall Co.	18	13	53	4	0	1	0
Armour Fertilizer Works	15	10	44	4	1	0	1
Associated Seed Growers, Inc.	1	0	3	1	0	0	0
Joseph Breck & Sons Corp.	3	2	10	0	1	0	0
Consolidated Rendering Co.	12	10	36	1	1	0	0
Davison Chemical Corp.	7	5	20	0	2	0	1
Doughten Seed Co.	2	1	6	1	1	0	0
Eastern States Farmers' Exchange, Inc.	10	8	38	0	0	1	2
Essex County Cooperative Farming Association	3	3	10	0	0	0	0
Frank's Market Garden	1	0	3	0	1	0	0
Goulard & Olena, Inc.	3	3	9	0	0	0	0
Hydroponic Chemical Co., Inc.	1	1	3	0	0	0	0
Hy-Trous Corp.	1	1	3	0	0	0	0
International Minerals & Chemical Corp.	23	14	79	6	2	1	0
McCormick & Co., Inc.	1	1	3	0	0	0	0
Miller Chemical & Fertilizer Corp.	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	19	17	58	1	1	0	0
Olds & Whipple, Inc.	9	9	27	0	0	0	0
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbs Corp.	1	0	3	0	0	0	1
Ra-Pid-Gro Corp.	1	0	3	0	0	0	1
Rogers & Hubbard Co.	15	13	44	1	0	0	1
Saratoga Laboratories, Inc.	1	0	4	0	0	0	1
O. M. Scott & Sons Co.	1	0	3	0	0	0	1
Sears, Roebuck & Co.	3	1	9	2	0	0	0
M. L. Shoemaker Division of Wilson & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	2	1	6	1	1	0	0
Swift & Company Plant Food Division	3	1	9	2	1	0	0
Tennessee Corp.	2	1	6	1	0	1	0
I. P. Thomas & Son Co.	2	2	6	0	0	0	0
C. P. Washburn Co.	2	0	6	1	1	0	0
TOTALS	191	132	589	38	16	4	9

Explanation of Table of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More per Ton

Name of Manufacturer Place Sampled, and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Approximate Commercial Shortage Per Ton
	Water Insoluble Organic	Total			
Davison Chemical Corp. Checkerboard Feed Store, Fitchburg Davco Granulated 4-12-4.	.09	3.56	11.61	4.00	\$2.40
Plantabbs Corp. T. J. Moriarty, New Bedford Fulton's Plantabbs 11-15-20.....	—	10.21	17.77	22.60	<i>a</i>
Ra-Pid-Gro Corp. Joseph Breck & Sons Corp., Boston Ra-Pid-Gro 23-21-17.....	—	24.17	21.01	15.04	<i>a</i>
Rogers & Hubbard Co. Rogers & Hubbard Co., Hatfield Hubbard Golf Course 8-6-2	1.91	6.96	6.18	3.20	4.16
O. M. Scott & Sons Co. T. J. Moriarty, New Bedford Weed & Feed 7-11-5.....	4.03	7.65	6.96	5.30	<i>a</i>

a Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient mixtures.

Mixtures Substantially Complying with Guarantees

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Magne- sium Oxide Found
	Water Insoluble Organic	Total			
American Agricultural Chemical Co.					
AA Quality 0-14-14 (7)*.....	—	—	14.03	14.40	—
AA Quality 5-8-7.....	.21	5.23	8.02	7.02	—
AA Quality 5-8-7 (9).....	.21	5.00	8.26	7.00	—
AA Quality 5-10-10.....	.17	5.11	10.04	9.88	—
A rico for Corn 3-12-6.....	.34	3.31	12.07	5.70	—
Agrico for Seeding Down 3-12-12.....	.12	3.04	12.08	11.89	—
Agrico for Seeding Down 3-12-12.....	.08	2.76	12.05	12.00	—
Agrico for New England 5-8-7.....	.26	5.10	8.03	7.00	—
Agrico for New England 5-8-7.....	.17	5.10	8.26	7.09	—
Agrico for New England 5-8-7.....	.45	5.00	8.03	7.05	—
Agrico for New England 5-8-7.....	.44	5.00	7.92	7.25	—
Agrico for Gardens 5-10-5.....	.30	5.21	10.36	5.04	—
Agrico for Onions 5-10-5.....	.50	5.00	9.77	4.73	—
Agrico for Potatoes 5-10-10.....	.17	5.16	9.83	10.04	—
Agrico for Potatoes 5-10-10.....	.20	5.00	10.03	9.67	—
Agrico for Potatoes 5-10-10.....	.12	5.02	10.10	9.81	—
Agrico for Tobacco 6-3-6.....	2.77	6.00	3.79	6.00 <i>a</i>	—
Agrico for Tobacco 6-3-6.....	2.77	5.81	4.01	6.05 <i>a</i>	—
Agrico for Tobacco 6-3-6.....	2.69	5.77	3.81	6.36 <i>a</i>	—
Agrico for Tobacco 6-3-6.....	2.87	6.00	3.76	6.14 <i>a</i>	—
Agrico Broadleaf Evergreens 6-10-4.....	.34	5.80	10.11	4.71	—

* A number in parenthesis after the brand name indicates number of samples included in composite sample analyzed.
a In forms other than muriate

Mixtures Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Magnesium Oxide Found
	Water Insoluble Organic	Total			
Agrico Country Club 6-10-4.....	.51	6.09	10.20	3.88	—
Agrico for Lawns, Trees & Shrubs 6-10-4...	.49	6.02	10.14	4.07	—
Agrico for Top Dressing 7-7-7.....	.12	7.31	7.15	7.23	—
Agrico for Top Dressing 7-7-7.....	.15	7.00	7.13	7.15	—
Agrico Country Club 8-6-2.....	1.45	7.80	6.00	2.44	—
Apothecaries Hall Co.					
Liberty 0-14-14.....	—	—	14.59	13.44	—
Liberty 4-12-4.....	.54	4.96	12.06	4.97	—
Liberty 4-12-4.....	.54	4.72	12.09	4.32	—
Liberty High Grade Market Garden 5-8-7...	.33	5.27	8.41	7.57	—
Liberty High Grade Market Garden 5-8-7...	.60	5.53	8.13	7.66	—
Liberty High Grade Market Garden (Sulphate Potash) 5-8-7.....	.72	5.31	8.91	7.19 _a	—
Liberty High Grade Market Garden (2% MgO).....	.45	5.21	8.55	7.34	3.95
Liberty 5-10-5.....	.38	4.92	10.39	5.64	—
Liberty 5-10-10.....	.50	5.23	9.92	10.70	—
Liberty 5-10-10.....	.41	5.07	10.18	10.70	—
Liberty 5-10-10.....	.35	5.38	10.35	9.96	—
Liberty 5-10-10 (2% MgO).....	.25	5.72	10.57	10.07	2.90
Liberty Tobacco Mixture 6-3-6.....	3.50	6.26	4.66	6.51 _a	—
Liberty Tobacco Mixture with Cotton Hull Ashes 6-3-6.....	3.16	5.90	4.43	6.94 _a	—
Liberty Green Gro 6-7-4.....	.81	6.59	7.53	4.71	—
Liberty Special for Fruit & Grass 7-7-7.....	.39	7.58	7.35	7.42	—
Liberty Special for Fruit & Grass 7-7-7.....	.65	7.73	8.03	7.64	—
Liberty Special for Fruit & Grass 7-7-7.....	.67	7.37	8.09	7.44	—
Armour Fertilizer Works					
Armour's Big Crop 0-14-14.....	—	—	14.34	14.08	—
Armour's Big Crop 4-12-4.....	.61	4.25	12.07	4.03	—
Armour's Big Crop 4-12-8.....	.16	4.26	11.06	9.43	—
Armour's Big Crop 5-8-7.....	.61	4.78	8.18	6.80	—
Armour's Big Crop 5-8-7.....	.25	5.39	9.03	6.82	—
Armour's Big Crop 5-8-7.....	.18	5.10	8.52	6.63	—
Armour's Big Crop 5-10-5.....	.24	5.09	9.97	5.76	—
Armour's Velvetgreen Plant Food 5-10-5...	.35	5.70	10.11	5.25	—
Armour's Velvetgreen Plant Food 5-10-5...	.33	5.10	10.61	5.60	—
Armour's Big Crop 5-10-10.....	.28	5.09	10.27	10.16	—
Armour's Big Crop 5-10-10.....	.53	5.23	10.23	10.36	—
Armour's Big Crop Tobacco Special 6-3-6...	2.62	6.01	3.48	6.14 _a	—
Armour's Big Crop Tobacco Special 6-3-6...	2.59	6.00	3.54	6.22 _a	—
Armour's Big Crop 7-7-7.....	.77	7.50	7.30	7.36	—
Armour's Special Ornamental 10-6-4.....	.20	10.12	7.13	4.17	—
Associated Seed Growers, Inc.					
Japedizer 8-6-4.....	1.26	7.87	6.36	4.65	—

a In forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Magnesium Oxide Found
	Water Insoluble Organic	Total			
Joseph Breck & Sons Corp.					
Breck's Country Club 8-6-2.....	.53	8.00	6.57	2.11	—
Brexone Garden-Gro 5-10-10 (2% MgO)....	.37	5.07	10.24	10.30	3.69
Brexone Turf-Gro 8-6-2.....	.53	7.75	6.61	2.47	—
Consolidated Rendering Co					
Corenco 4-12-4 Complete Manure.....	.24	4.93	11.96	5.94	—
Corenco 4-12-16 Ladino Special.....	.06	4.29	12.29	16.21	—
Corenco 5-8-7 Potato & General Crop (4)....	.22	5.07	8.15	7.38	—
Corenco 5-8-7 Potato & General Crop.....	.22	5.20	8.33	7.57	—
Corenco 5-8-7 Potato & General Crop.....	.20	5.23	8.07	7.09	—
Corenco 5-10-5 Home Garden.....	.11	5.06	10.09	5.39	—
Corenco 5-10-5 Onion Special—Super Truck	.16	5.00	10.06	5.10	—
Corenco 5-10-10 Peerless Potato.....	.22	5.17	10.24	10.51	—
Corenco 6-3-6 Special Tobacco Grower....	3.71	6.22	4.09	6.45 _a	—
Corenco 7-7-7 Complete Fruit and Top Dressing.....	.15	7.00	7.76	7.19	—
Corenco 8-6-4 Landscape.....	.57	7.52	7.92	5.99	—
Corenco 8-6-4 Landscape "Special Extra Organic".....	1.72	8.28	7.16	4.00	—
Davison Chemical Corp.					
Davco Granulated 0-14-14.....	—	—	14.04	14.68	—
Davco Granulated 3-12-6.....	.09	3.14	12.55	6.48	—
Davco Granulated 5-8-7.....	.09	5.32	8.32	7.34	—
Davco Granulated 5-10-5.....	.09	5.31	10.00	5.26	—
Davco Granulated 5-10-10.....	.06	5.32	10.18	9.16	—
Davco Granulated 7-7-7.....	.06	7.16	7.17	7.16	—
Doughten Seed Co.					
Faith Soil Food with Insect Control 5-9-4..	2.89	5.00	9.41	4.68	—
Faith Lawn Diet 8-6-4.....	3.46	7.87	5.72	4.50	—
Eastern States Farmers' Exchange, Inc.					
Eastern States 0-19-19 with 5% Borax (1% MgO) <i>b</i>	—	—	20.20	17.64	1.85
Eastern States 0-20-20 (1% MgO).....	—	—	19.42	20.50	1.70
Eastern States 5-10-5 Garden (1% MgO)....	.78	5.16	10.30	5.66	2.39
Eastern States 5-10-10 (1% MgO).....	.21	5.42	10.03	10.91	2.39
Eastern States 5-15-10 (1% MgO).....	.25	5.28	15.83	10.68	1.88
Eastern States 5-15-15 (1% MgO).....	.24	5.38	15.15	16.24	2.03
Eastern States 8-4-8 Tobacco (2% MgO)....	3.71	8.31	4.23	8.51 _a	2.80
Eastern States 8-16-16 (1% MgO).....	.22	8.13	16.05	17.08	1.85
Eastern States 8-16-16 S. M. (2% MgO)....	.18	8.00	16.91	16.60	2.79
Eastern States 10-10-10 (1% MgO).....	.18	10.00	10.79	11.14	1.67

a In forms other than muriate.*b* Borax found, 4.17%.

Mixtures Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Magnesium Oxide Found
	Water Insoluble Organic	Total			
Essex County Cooperative Farming Association					
S-X Brand 5-8-7.....	.15	5.00	8.05	7.34	—
S-X Brand 5-10-10 (2% MgO) .....	.33	5.06	10.42	10.35	3.51
S-X Brand 7-7-7.....	.15	7.00	7.11	7.00	—
Frank's Market Garden					
F. M. G.—For More Growth .9-9-9.....	.50	2.12	2.27	.50	—
Goulard & Olena, Inc.					
G. & O. Rhodo-Azalea-Camellia Food 3-20-3 .....	.37	3.19	20.46	3.53	—
G. & O. Dahlia, Lily, Gladiola Food 5-6-15.....	1.67	5.65	6.39	17.62	—
G. & O. Rose Food 7-8-5.....	1.53	7.83	9.01	5.85	—
Hydroponic Chemical Co., Inc.					
Hyponex 7-6-19.....	—	7.15	6.70	20.88	—
Hy-Trous Corp.					
Hy-Trous 4-8-4.....	—	5.02	8.82	5.10	—
International Minerals & Chemical Corp.					
International 0-14-14.....	—	—	13.44	15.16	—
International 4-12-4.....	.15	4.06	11.64	4.13	—
International 4-12-4 (10.....	.13	4.00	11.75	4.09	—
International 4-12-8 (1% MgO).....	.17	4.23	12.10	8.57	1.56
International 4-12-16.....	.08	4.20	11.95	16.59	—
International 5-8-7.....	.15	5.06	8.04	7.34	—
International 5-8-7.....	.15	5.10	8.16	7.17	—
International 5-10-5.....	.16	5.04	10.04	5.25	—
International 5-10-5.....	.15	5.00	10.02	5.23	—
International 5-10-5 (Fertilis).....	.17	5.00	10.24	5.40	—
International 5-10-10 (1% MgO).....	.15	5.23	10.29	10.17	1.59
International 5-10-10 (1% MgO).....	.33	5.10	10.26	10.43	1.45
International 5-10-10 (1% MgO) (2).....	.11	5.02	10.03	10.66	1.57
International Caribe 5-10-10 (2% MgO).....	.47	5.04	10.89	10.27	2.93
International Potato 5-10-10 (2% MgO).....	.33	5.23	10.24	10.47	3.40
International Potato 5-10-10 (2% MgO).....	.32	5.17	10.21	10.00	3.26
International 5-10-10 (5% MgO).....	.07	5.08	10.04	10.00	4.87
International Tobacco 6-3-6.....	2.20	5.89	4.39	6.74 ^a	—
International Tobacco 6-3-6.....	2.17	5.77	4.34	6.86 ^c	—
International 7-7-7 (1% MgO).....	.15	7.00	7.56	7.48	2.39
International 7-7-7 (3% MgO).....	.47	7.00	7.21	7.50	4.93
International Lawn 8-6-2.....	.52	7.86	6.23	2.83	—
International 8-16-16 (1.5% MgO).....	.15	7.90	16.93	16.27	2.14
McCormick & Co., Inc.					
Hy-Gro 13-26-13.....	.73	14.99	26.12	15.78	—

^a In forms other than muriate.

^c .76% Muriate, 5.90% in forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Magnesium Oxide Found
	Water Insoluble Organic	Total			
Miller Chemical & Fertilizer Corp.					
Miller VHPF 5-25-15.....	—	5.93	25.24	17.14	—
Old Deerfield Fertilizer Co., Inc.					
Old Deerfield 0-14-14.....	—	—	14.00	15.08	—
Old Deerfield 4-12-8.....	.11	4.50	11.86	8.78	—
Old Deerfield 5-5-15 Tobacco Starter.....	1.10	5.45	6.62	15.62 _a	—
Old Deerfield 5-8-7 All Crop Fertilizer.....	.46	5.17	8.18	7.60	—
Old Deerfield 5-8-7 All Crop Fertilizer.....	.46	5.14	8.04	7.38	—
Old Deerfield 5-8-7 (2% MgO), Potash other than Muriate.....	.60	5.28	9.04	7.26 _a	2.06
Old Deerfield 5-10-5 Trucker's Special.....	.52	5.00	10.50	5.81	—
Old Deerfield 5-10-10 Potato Fertilizer.....	.17	5.42	10.21	10.56	—
Old Deerfield 5-10-10 Potato Fertilizer.....	.17	5.07	10.17	10.48	—
Old Deerfield 5-10-10 (2% MgO), Potash other than Muriate.....	.54	5.58	10.68	10.47 _a	3.19
Old Deerfield 6-3-6 Complete Tobacco.....	2.89	6.04	3.90	7.07 _a	—
Old Deerfield 6-3-6 Complete Tobacco.....	2.98	6.16	3.74	7.43 _a	—
Old Deerfield 6-3-6 Complete Tobacco.....	2.81	6.16	3.79	7.70 _a	—
Old Deerfield 6-3-6 Complete Tobacco.....	2.99	6.23	3.64	7.83 _a	—
Old Deerfield 6-3-6 Complete Tobacco.....	3.41	6.01	5.20	8.46 _a	—
Old Deerfield Lawnshrub 6-5-5.....	1.31	6.08	5.58	5.68	—
Old Deerfield 7-7-7 Grass Top Dressing.....	.09	7.33	7.27	7.56	—
Old Deerfield 7-7-7 Grass Top Dressing.....	.13	7.40	7.17	7.35	—
Old Deerfield 8-16-16.....	.31	8.04	15.74	17.02	—
Olds & Whipple, Inc.					
O & W 4-12-4 Market Garden.....	.79	4.53	12.28	5.00	—
O & W 5-5-15 High Grade Tobacco Starter and Potash.....	.97	5.18	5.58	15.22 _a	—
O & W Potato & General Purpose 5-8-7.....	.68	5.39	8.64	7.77	—
O & W Potato & General Purpose 5-8-7.....	.80	5.25	8.32	7.85	—
O & W 5-10-5.....	.95	5.86	10.17	5.21	—
O & W Potato 5-10-10.....	.71	5.69	10.66	10.98	—
O & W Potato 5-10-10.....	.26	5.63	10.22	10.76	—
O & W Blue Label Tobacco 6-3-6.....	3.77	6.08	3.79	6.84 _a	—
O & W 7-7-7 Top Dressing & Grass.....	1.02	7.76	7.02	7.38	—
F. G. Phillips Co.					
Ferti-Flora 3-3-3.....	—	3.24	3.15	3.63	—
Rogers & Hubbard Co.					
Gro-Fast Plant Food 5-8-5.....	1.30	5.53	8.13	5.62	—
Alfalfa 0-14-14.....	—	—	14.48	14.65	—
Seeding 3-12-12.....	.35	3.85	11.92	12.31	—
Corn 4-12-4.....	.40	4.39	12.20	4.73	—
Potato 5-8-7.....	1.73	5.00	8.44	8.02	—
Potato 5-8-7.....	1.91	5.42	8.61	7.27	—

a In forms other than muriate.

Mixtures Substantially Complying with Guarantees—Concluded

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Magnesium Oxide Found
	Water Insoluble Organic	Total			
Rogers & Hubbard Co.—Con.					
Vegetable 5-8-7.....	.44	5.42	8.37	7.40	—
Vegetable 5-8-7.....	.46	5.32	8.43	7.31	—
Hubbard Garden 5-10-5.....	.37	5.35	10.22	5.91	—
General Crop 5-10-10.....	.36	5.45	10.39	10.23	—
High Potash 5-10-10.....	1.31	5.53	10.27	10.47	—
Tobacco Grower 6-3-6.....	2.75	6.16	3.20	6.49 _a	—
Top Dressing 7-7-7.....	.44	7.22	7.32	7.60	—
Double Strength 8-16-16.....	.34	8.29	16.45	16.36	—
Saratoga Laboratories, Inc.					
Trace L 8-16-7 (3% MgO).....	—	8.85	18.72	7.89	2.08
Sears, Roebuck & Co.					
Cross Country Plant Food 4-12-4.....	.27	4.00	12.02	3.76	—
Cross Country Rose Food 5-10-5.....	.47	5.18	10.57	5.02	—
Cross Country Liquid Plant Food 10-5-5.....	—	10.29	5.88	4.81	—
M. L. Shoemaker Division of Wilson & Co., Inc.					
"Swift-Sure" 4-10-0.....	.52	4.00	10.27	—	—
Smith Agricultural Chemical Co.					
Sacco 4-12-4.....	.51	4.37	12.47	4.52	—
Wedo 6-10-4.....	1.32	6.00	9.96	3.60	—
Swift & Company Plant Food Division					
Brimm 5-10-10.....	.10	5.00	9.84	9.57	—
Red Steer 5-8-7.....	.11	5.06	8.63	6.92	—
Vigoro 4-12-4.....	.71	4.27	12.66	4.61	—
Tennessee Corp.					
Loma 5-10-5.....	.21	5.35	10.13	5.19	—
Loma 8-8-8 Mineralized.....	.28	7.85	9.00	7.44	—
I. P. Thomas & Son Co.					
I. P. Thomas 4-12-4 (2).....	.28	4.05	12.00	5.06	—
I. P. Thomas 5-10-10 (2).....	.22	5.13	10.01	10.17	—
C. P. Washburn Co.					
Washburn's (Market Garden) 5-8-7.....	.40	5.00	7.93	7.36	—
Washburn's (Special Potato) 5-10-10.....	.33	5.04	9.71	10.00	—

a In forms other than muriate.

NITROGEN COMPOUNDS

Agrinite, Ammonium Nitrate, Calcium Cyanamid, Castor Pomace,
Cottonseed Meal, Nitrate of Soda, Sulfate of Ammonia

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
American Agricultural Chemical Co. Agrinite.....	8.90	8.25
American Cyanamid Co. Aero Cyanamid 20.6%.....	20.14	20.60
Aeroprills Ammonium Nitrate Fertilizer.....	33.77	33.50
Apothecaries Hall Co. Castor Pomace.....	5.88	4.50
Ashcraft-Wilkinson Co. Cow-Eta Brand 41% Protein Cottonseed Meal.....	6.80	6.56
Chilean Nitrate Sales Corp. Chilean Nitrate of Soda—Champion Brand.....	16.08	16.00
Chilean Nitrate of Soda—Champion Brand.....	16.09	16.00
Chilean Nitrate of Soda—Champion Brand (a).....	16.11	16.00
L. B. Lovitt & Co. Lovit Brand 41% Protein Cottonseed Meal.....	6.59	6.56
Old Deerfield Fertilizer Co., Inc. Old Deerfield Sulfate of Ammonia.....	20.73	20.50

a Composite of 2 samples.

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Dry Ground Fish, Milorganite

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid		Available Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed
Apothecaries Hall Co. Dry Ground Fish.....	10.34	9.00	7.23	5.00	-	-
Old Deerfield Fertilizer Co., Inc.						
Dry Ground Fish.....	9.96	9.00	7.38	5.00	-	-
Dry Ground Fish.....	10.00	9.00	7.35	5.00	-	-
Dry Ground Fish.....	9.14	9.00	7.30	5.00	-	-
Olds & Whipple, Inc. Menhaden Dry Ground Fish	9.63	9.00	7.32	5.00	-	-
Rogers & Hubbard Co. Dry Ground Fish.....	10.23	9.56	7.00	5.00	-	-
Sewerage Commission of the City of Milwaukee Milorganite.....	6.08	6.00	3.48	—	3.02	2.00

Ground Bone

Manufacturer	Nitrogen		Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
American Agricultural Chemical Co.....	2.76	2.00	25.35	23.00
Apothecaries Hall Co.....	3.64	3.70	20.96	20.00
Armour Fertilizer Works.....	2.66	2.47	28.40	23.00
Central Chemical Corp.....	2.38	2.30	27.13	20.00
Consolidated Rendering Co.....	2.28	2.00	26.88	23.00
Faesy & Besthoff, Inc.....	3.28	2.47	25.00	23.00
A. H. Hoffman, Inc.....	3.92	3.70	25.70	20.00
John Reardon & Sons Division of Wilson & Co., Inc.	2.89	2.00	26.57	21.00
Rogers & Hubbard Co.....	2.89	2.00	28.00	23.00

Brands Showing Commercial Shortage of More than \$1 per Ton

International Minerals & Chemical Corp.....	1.88 ^a	2.47	24.95	23.00
Sears, Roebuck & Co.....	1.42 ^b	2.00	33.20	20.00

^a Commercial shortage, \$5.90 per ton.

^b Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient brands.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
18% Normal Superphosphate.....	19.75	19.05	18.00
18% Normal Superphosphate (2)*.....	18.45	18.23	18.00
Apothecaries Hall Co.			
Superphosphate, Granular, 20%.....	21.73	21.12	20.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%.....	21.42	20.07	20.00
Consolidated Rendering Co.			
Corenco Superphosphate 20%.....	20.09	19.91	20.00
Corenco Superphosphate 20% (7)*.....	20.35	20.35	20.00
Davison Chemical Corp.			
Davco Granulated Superphosphate 20%.....	21.47	20.48	20.00
Eastern States Farmers' Exchange, Inc.			
Eastern States 20% Superphosphate.....	22.13	20.36	20.00
International Minerals & Chemical Corp.			
International 20% Superphosphate.....	21.75	20.35	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield Superphosphate 20%.....	20.10	20.00	20.00
Rogers & Hubbard Co.			
Superphosphate 20%.....	21.45	20.71	20.00

* The number of samples included in the composite sample analyzed.

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Apothecaries Hall Co.....	60.56	60.00
Consolidated Rendering Co.....	59.55	60.00
Davison Chemical Corp.....	49.62	50.00
Eastern States Farmers' Exchange, Inc.....	60.79	60.00
International Minerals & Chemical Corp.....	60.07	60.00
Old Deerfield Fertilizer Co., Inc.....	61.32	60.00
Rogers & Hubbard Co.....	59.72	60.00

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash	Organic Matter	Acid Insoluble Ash*	Moisture
American Agricultural Chemical Co. Pulverized Sheep Manure (1.25-1-2)	1.23	1.20	3.04	32.70	50.70	3.80
Armour Fertilizer Works Pulverized Sheep Manure (1.5-1-2)	1.53	1.31	2.12	36.30	37.80	7.40
Atkins & Durbrow, Inc. Driconure (2-1-1)	2.33	3.68	1.78	52.20	25.00	8.40
Consolidated Rendering Co. Corenco Sheep Manure (1.25-1-2)	1.23	1.12	2.78	36.40	45.70	5.10
Spurz-on (3.5-3.5-1.5)	5.56	4.01	2.20	76.80	3.20	4.50
A. H. Hoffman, Inc. Cow Manure (Dehydrated) (2-1-1)	2.21	1.60	2.54	81.90	1.80	7.10
Poultry Manure (Dehydrated) (3-1-1.5)	4.03	4.44	2.26	70.20	2.70	7.20
Sheep Manure (Kiln-Dried) (1.5-1-2)	1.34	1.28	4.06	36.90	44.40	5.20
International Minerals & Chemical Corp. Sheep Manure (1.25-1-2)	1.58	1.33	2.72	27.10	36.30	7.70
Norwood Brand Fertilizer Co., Sheep Manure Screened from Wool (1.5-.35-2.75)	1.33	.31	3.16	36.70	47.30	3.90
Pulverized Manure Co. Wizard Brand Cow Manure (2-1-1)	1.58	1.22	1.78	50.40	32.60	4.10
Wizard Brand Pulverized Sheep Manure (2-1-2)	1.79	1.41	3.92	55.30	24.00	6.80
Rogers & Hubbard Co. Gro-Fast Sheep Manure (1.25-1-2)	1.25	1.20	3.50	32.00	50.80	4.50
Sears, Roebuck & Co. Cross Country Cattle Manure (1.5-1.5-1.75)	1.44	1.22	3.38	39.90	4.06	5.90
Cross Country Sheep Manure (1.5-1-2)	1.14	1.10	2.72	27.70	54.80	5.80
Stockdale Fertilizer Co. Ovene (Sheep Manure) (2-1-2)	2.28	1.71	2.36	65.00	12.20	8.70
Walker-Gordon Laboratory Co. Bovette (2-1-1)	2.05	1.66	2.36	83.20	1.50	6.40
Bovung (2-1-1)	1.98	1.37	2.54	81.60	2.80	6.70

* The acid insoluble ash is mainly sand although it may contain other materials which are practically worthless as plant food.

AGRICULTURAL LIME PRODUCTS

Explanation of Table of Analyses

Tables I and II: "Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "percent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "percent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical analysis" the figures represent the percentage of product that would pass or be retained by the meshed sieves mentioned.

Table I. Hydrated or Slaked Lime

Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Percent	Pounds in One Ton	
A. H. Hoffman, Inc. Hoffman Hydrated Lime.....	65.1	70.0	4.1	1.0	69.8	1396	1.3
Lee Lime Corporation Lee Double Strength Agricultural Hydrated Lime.....	46.3	45.0	33.2	30.0	90.2	1804	1.2
Lee Hydrated Lime for General Purposes.....	43.8	45.0	31.4	30.0	84.5	1690	.9
Tobey Agra Hydrate.....	39.4	35.0	27.7	25.0	76.8	1536	1.2
New England Lime Co. Nelco Agricultural Hydrated Lime (Adams).....	72.1	70.0	1.5	.5	74.5	1490	1.0
Nelco Agricultural Hydrated Lime (Canaan, Conn.).....	46.9	47.0	33.0	31.0	91.6	1832	.3
Nelco Land Lime (Canaan, Conn.).....	52.1	35.0	20.8	25.0	80.3	1606	.5
United States Gypsum Co. Red Top General Purpose Hydrated Lime (Farnams).....	73.4	70.0	1.2	trace	74.5	1490	.2
Vermont Associated Lime Industries, Inc., Green Mountain Lime Co. Division Handy Hydrated Lime.....	66.1	60.0	5.4	1.0	73.8	1476	.2
Snowfluff Agricultural Hydrated Lime.....	69.3	65.0	4.9	1.0	76.4	1528	.7

Table II. Ground Limestone

Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Percent)	
	Found	Guaranteed	Found	Guaranteed	Percent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Allied Minerals, Inc. Hoosac Agricultural Limestone (Adams).....	53.6	54.0	.6	.5	54.9	1098	3.1	96.1	none
Conklin Limestone Co., Inc. High Magnesium Agricultural Ground Limestone (Lincoln, R. I.).....	36.7	34.0	13.6	14.0	49.7	994	11.4	62.6	none
Lee Lime Corporation Lee Pulverized Limestone.....	31.3	30.0	21.5	20.0	63.9	1278	3.4	59.3	none*
Tobey Pulverized Limestone.....	41.5	35.0	9.1	7.0	54.1	1082	6.6	*	*
Limestone Products Corporation of America Lime Crest Brand of Calcite Pulverized Limestone.....	37.5	42.0	5.3	2.0	43.9	878	22.3	79.0	.2
New England Lime Co. Nelco Agricultural Limestone (Adams).....	53.1	53.5	.9	.4	54.5	1090	3.7	80.6	none
United States Gypsum Co. USG Agricultural Limestone (Farnams).....	54.0	50.5	1.2	.25	55.9	1118	3.7	*	*

* Not determined

Table III. Gypsum or Land Plaster

Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Calcium Sulfate (CaSO ₄)		Insoluble Matter
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
United States Gypsum Co. Ben Franklin Agricultural Gypsum.....	33.0	30.0	0.5	trace	79.9	46.5	1.9

DIRECTORY OF MANUFACTURERS WHO REGISTERED AGRICULTURAL LIME PRODUCTS FOR SALE IN MASSACHUSETTS IN 1949

Allied Minerals, Inc., West Chelmsford, Mass.
 Conklin Limestone Co., Inc., Sand Road, Canaan, Conn.
 Conklin Limestone Co., Inc., Saylesville, R.F.D., R. 1.
 A. H. Hoffman, Inc., Landisville, Penn.
 Kelley Island Lime & Transport Co., 1122 Leader Bldg., Cleveland 14, Ohio
 Lee Lime Corporation, Lee, Mass.
 Lime Products Corporation of America, 122 Main St., Newton, N. J.
 New England Lime Co., Adams, Mass.
 United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.
 Vermont Associated Lime Industries, Inc., Green Mountain Lime Co. Division, Winooski, Vt.

DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE IN MASSACHUSETTS IN 1949

American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St. at St. Clair, Marietta, Ohio
 Apothecaries Hall Co., Waterbury 88, Conn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
 Associated Seed Growers, Inc., Milford, Conn.
 Atkins & Durbrow, Inc., 165 John St., New York 7, N. Y.

Barrett Division, Allied Chemical & Dye Corporation, 40 Rector St., New York 6, N. Y.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Joseph Breck & Sons Corporation, 401 Summer St., Boston 10, Mass.

Central Chemical Corporation, Lebanon, Penn.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.

Davey Tree Expert Co., 117 South Water St., Kent, Ohio
 Davison Chemical Corporation, 20 Hopkins Place, Baltimore, Md.
 Doughten Seed Co., 151 Twelfth St., Jersey City 2, N. J.
 E. I. du Pont de Nemours & Co., Wilmington 98, Del.

Eastern States Farmers' Exchange, Inc., 26 Central St., West Springfield, Mass.
 Essex County Cooperative Farming Association, Topsfield, Mass.
 Excell Laboratories, 2623 Indiana Ave., Chicago, Ill.

Faesy & Besthoff, Inc., 220 East 42nd St., New York 17, N. Y.
 Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
 Frank's Market Garden, 1398 Allen St., Springfield, Mass.
 Frost & Higgins Co., 20 Mill St., Arlington, Mass.

Goulard & Olena, Inc., Skillman, N. J.

A. H. Hoffman, Inc., Landisville, Penn.
 Humphreys-Godwin Co., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., Copley, Ohio
 Hy-Trous Corporation, 3 Green St., Woburn, Mass.

- International Minerals & Chemical Corporation, Woburn, Mass.
- Lawson C. Kateley, 8 Shaffner St., Worcester, Mass.
L. B. Lovitt & Co., Memphis 3, Tenn.
- McCormick & Co., Inc., McCormick Bldg., Baltimore 2, Md.
Marianna Sales Co., 510 Cotton Exchange Bldg., Memphis, Tenn.
Miller Chemical & Fertilizer Corporation, 1000 South Caroline St., Baltimore 31, Md.
- Norwood Brand Fertilizer Co., Mt. Vernon St., North Reading, Mass.
- Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
Olds & Whipple, Inc., 168 State St., Hartford, Conn.
- F. G. Phillips Co., 255 Cedar St., Dedham, Mass.
Plantabbs Corporation, 1 West Biddle St., Baltimore 1, Md.
Plantspur Products Co., 1072 West Side Ave., Jersey City 6, N. J.
Premier Peat Moss Corporation, 535 Fifth Ave., New York 17, N. Y.
Pulverized Manure Co., 503 Exchange Bldg., Union Stock Yards, Chicago 9, Ill.
- Ralston Purina Co., St. Louis 2, Mo.
Ra-Pid-Gro Corporation, Dansville, N. Y.
John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
Rogers & Hubbard Co., Portland, Conn.
Rose Manufacturing Co., Beacon, N. Y.
N. Roy & Son, South Attleboro, Mass.
Ruhm Phosphate & Chemical Co., Mt. Pleasant, Tenn.
Rway Agricultural Products Division of Reiss Manufacturing Corporation, 1120 Maryland Ave., Sheboygan, Wis.
- Saratoga Laboratories, Inc., Saratoga Springs, N. Y.
O. M. Scott & Sons Co., Marysville, Ohio
Sears, Roebuck & Co., 925 South Homan Ave., Chicago 7, Ill.
Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave., & Venango St., Philadelphia 34 Penn.
- Smith Agricultural Chemical Co., Columbus 16, Ohio
Stockdale Fertilizer Co., Morris, Ill.
Swift & Company Plant Food Division, 25 Faneuil Hall Square, Boston 9, Mass.
Synthetic Nitrogen Products Corporation, 285 Madison Ave., New York 17, N. Y.
- Tennessee Corporation, Lockland, Cincinnati 15, Ohio
Tennessee Corporation, 619 Grant Bldg., Atlanta 1, Ga.
I. P. Thomas & Son Co., 721 Market St., Camden, N. J.
Thomson Phosphate Co., 407 South Dearborn St., Chicago 5, Ill.
- Universal Chemical Co., 106 Ontario St., Lynn, Mass.
- Walker-Gordon Laboratory Co., Plainsboro, N. J.
C. P. Washburn Co., Middleboro, Mass.
Woodruff Fertilizer Works, Inc., North Haven, Conn.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 143

NOVEMBER 1949

Seed Inspection

By Seed Control Service Staff

This report, the twenty-second in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1949 by authority of Chapter 94 as amended by Chapter 377 of the Acts of 1946.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The following regulations and fees have been approved by the Director of the Massachusetts Agricultural Experiment Station.

FIELD CROPS:	KIND OF SEED	PURITY ONLY	GERMINATION ONLY	PURITY AND GERMINATION
Alfalfa, Rape, Ryegrasses, Soybeans, Timothy.....		\$1.00	\$0.50	\$1.25
Cereals, Buckwheat, Sudan Grass, Vetches.....		1.25	.50	1.50
Clovers, Fescues, Reed Canary Grass.....		1.00	.50	1.50
Brome Grass, Millets.....		1.50	.50	2.00
Bentgrasses, Bluegrasses, Orchard Grass, Redtop....		2.00	.50	2.25
Redtop (Unhulled).....		2.50	.50	2.75

Mixtures: Lawn, Pasture, Mowing, etc.
 Purity only.....\$2.50
 Germination only..... .50 for each component
 Purity and Germination..... 2.50 + .50 for each component

Special Mixtures: Consisting of two kinds of cereals, two kinds of clover only, or Timothy and one kind of clover
 Purity only..... \$1.25
 Germination only..... .50 each
 Purity and Germination..... 2.00

Vegetables: Germination tests for all kinds of vegetable seeds, 30 cents each.

Cleaning Tobacco Seed: For each lot of one pound or less, based on the weight of seed as received for cleaning, 50 cents.

Kinds of Seed Not Listed: Fees for testing and for other seed determinations not listed will be based on the time consumed in making the test or for other service requested.

Free Tests: During any one calendar year, the Seed Testing Laboratory will allow two free tests of vegetable or tobacco seed to any person residing or doing business in the Commonwealth.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any kind to be submitted for a germination test is 400.

Samples should be taken so as to correctly represent the lot sampled, each placed in a strong container, the parcel of samples securely wrapped and addressed to Seed Laboratory, Agricultural Experiment Station, Amherst, Mass.

Checks or Money Orders must be made payable to the University of Massachusetts and sent to the Seed Laboratory.

In no case will the final report for work done be rendered until all fees are paid.

SEED INSPECTION FOR THE SEASON OF 1949

By Seed Control Service Staff:

F. A. McLaughlin, *Associate Research Professor in Charge*

Jessie L. Anderson, *Research Instructor*
Waldo C. Lincoln, Jr., *Laboratory Assistant*
Thomas O. Martin, *Laboratory Assistant*

Mrs. Phyllis Russell, *Laboratory Assistant*
May J. Honnay, *Clerk*
Mrs. Mabel Martell, *Junior Clerk*
*A. Warren Clapp, *State Inspector*

Massachusetts Vegetable Seed Standards for 1950

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>).....	60	Kale.....	75
Asparagus.....	*70	Kohlrabi.....	75
Bean, Lima.....	70	Leek.....	60
Bean, Scarlet Runner.....	75	Lettuce.....	80
Bean, Other Varieties.....	75	Muskmelon.....	75
Beet.....	65	Mustard.....	75
Broccoli.....	75	Okra.....	*50
Brussels Sprouts.....	70	Onion.....	70
Cabbage.....	75	Parsley.....	60
Cabbage, Chinese.....	75	Parsnip.....	60
Carrot.....	55	Peas.....	80
Cauliflower.....	75	Pepper.....	55
Celeriac.....	55	Pumpkin.....	75
Celery.....	55	Radish.....	75
Chard, Swiss.....	65	Rhubarb.....	60
Chicory.....	65	Rutabaga.....	75
Citron.....	65	Salsify.....	75
Collard.....	80	Sorrel.....	60
Corn, Sweet.....	75	Soybean.....	75
Cress, Garden or Curled.....	40	Spinach, Common.....	60
Cress, Water.....	35	Spinach, New Zealand.....	40
Cucumber.....	80	Squash.....	75
Dandelion.....	45	Tomato.....	75
Egg Plant.....	60	Tomato, Husk.....	50
Endive.....	70	Turnip.....	80
Fetticus (Corn Salad).....	70	Watermelon.....	70

*Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds and the percentage of hard seed, if present, must be stated.

*Employed by the State Department of Agriculture.

1949 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1948, to November 1, 1949, the Seed Laboratory received 7067 samples of seed, of which 836 were collected by the State Department of Agriculture and 6231 were sent in by seedsmen, farmers and various state institutions. An additional lot of 268 samples of flower seeds, for field tests only, was received from the State Commissioner of Agriculture.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 7067 samples was 374 for purity and 7715 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
262 Field Crops for Purity and Germination.....	262	262
595 Field Crops for Germination Only.....	.....	595
94 Lawn Mixtures for Germination Only; Germinations involving 438 ingredients.....	.....	438
95 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 416 ingredients	95	416
17 Lawn Mixtures for Purity Only.....	17	.....
5826 Vegetables for Germination Only.....	.....	5826
11 Tree Seeds for Germination Only.....	.....	11
135 Tobacco Seeds for Germination Only.....	.....	135
32 Flower Seeds for Germination Only.....	.....	32
<hr/>	<hr/>	<hr/>
7067	374	7715

Field tests to determine trueness to type were conducted in cooperation with the Departments of Olericulture and Floriculture, which tested 299 samples of vegetable seeds and 263 samples of flower seeds, respectively.

The Seed Laboratory cleaned 95 lots of tobacco seed for Connecticut Valley farmers. The gross weight of the tobacco seed was 81.93 pounds, and the net weight for the cleaned seed was 69.46 pounds.

Explanation of Tables

Tables 1 - 3 contain seeds, the sale of which is regulated by Chapter 94 as amended by Chapter 377 of the Acts of 1946: Table 1, Agricultural Seeds as defined under Section 261 B1; Table 2, Mixtures of Agricultural Seeds as defined under Section 261 B1; and Table 3, Vegetable Seeds only, under provisions of Section 261 B2 and 261 C.

All samples were taken by an inspector from the State Department of Agriculture and were tested at the Seed Laboratory according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement. Mislabeling and other irregularities are emphasized by boldface type and explained in the final column of the table. The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

Table 4 is a summary, by wholesalers, of the total number of samples tested, showing how many were correctly labeled and how many were mislabeled.

Table 1.—Results of Inspection and Analyses of Field Seeds—Sections 261 B1 and 261 C.

Each lot of Agricultural Seeds must be labeled to show the commonly accepted name and variety, except that for Barley, Buckwheat, Oats, Rye and Wheat, when the variety is unknown the label shall bear the statement: "Variety Unknown." The label must also show lot number or other identification; percentage, by weight, of pure seed; percentage, by weight, of inert matter; percentage, by weight, of weed seeds; percentage, by weight, of other agricultural seeds; percentage of (a) germination, exclusive of hard seeds, (b) hard seeds, if present; month and year germination test was completed; origin of Alfalfa, Red Clover and Field Corn (other than Hybrid), except if origin is unknown, it must be so stated; name and address of the person who labeled the seed, or who sells, offers or exposes such seed for sale and the names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams and 1 in 10 grams of the smaller seeds, and per pound when present in excess of 1 in 25 grams and 1 in 100 grams of the larger seeds. Secondary noxious weeds are dodder (*Cuscuta spp.*), horse nettle (*Solanum carolinense*), wild mustards (*Brassica spp.*), wild garlic and wild onion (*Allium spp.*), perennial sow thistle (*Sonchus arvensis*), corncockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*). Seed is prohibited from sale for having a false or misleading label; unless the test for germination has been completed within a nine months period or if it contains primary noxious weed seeds in excess of tolerance. Primary noxious weeds are Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and quack grass (*Agropyron repens*).

One hundred and ninety-three samples of field crop seeds were analyzed in the laboratory. Results of analysis, however, are given only for samples which were mislabeled. In this table complete analysis is recorded; but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number; Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1016	Bluegrass	Associated Seed Growers, Inc., New Haven, Conn. Frank Howard, Inc., Pittsfield Kentucky, No. 98320.....	L 82.50 F 83.58	0.10 0.15	17.40 16.24	Trace 0.03	80.00 68.00	12/1948 6/1949	Germination below that stated.
S-450	Timothy	W. Allee Burpee Co., Philadelphia, Pa. Danvers State Hospital, Danvers No. 6139.....	L 99.60 F 99.51	0.10 0.10	0.20 0.10	0.10 0.29	90.00 80.00	10/1948 4/1949	Germination below that stated.

325	Orchard Grass	Arthur R. Cone, Buffalo, N. Y. General Mills, Inc., Farm Service Div., Ayer No. 33-86.....	L 90.94 F 92.91	0.30 0.53	8.76 6.54	.. 0.02	85.00 89.00	2/1949 6/1949	Noxious weeds not declared, but 45 Buckhorn Plantain and 29 Wild Onion per oz. found.
1054	Redtop	General Mills, Inc., Farm Service Div., Chelmsford No. 30-186.....	L 92.29 F 90.61	0.71 1.25	6.95 7.99	0.05 0.15	85.00 83.00	1/1949 6/1949	Weed Seed excessive.
1070	Vetch	General Mills, Inc., Farm Service Div., Middleboro Spring, No. 70 x 30.....	L 96.95 F 97.11	... ...	2.90 1.93	0.15 0.96	96.00 97.00	3/1949 6/1949	Other Crop Seed excessive.
318	Alfalfa	Sunshine Feed Store, Ayer Canadian Grimm, No. 28-453.....	L 99.36 F 99.44	0.34 0.11	0.08 0.17	0.22 0.28	85-6 74-13	1/1949 6/1949	Germination below that stated.
363	Rye	Sunshine Feed Store, Bridgewater **Spring, No. 56-116.....	L 98.73 F 99.83	.. 0.01	1.17 0.03	0.10 0.13	87.00 73.00	2/1949 6/1949	**Variety required unless there is a statement "Variety Unknown." "Spring" is not a variety. Germination below that stated.
971	Alfalfa	Sunshine Feed Store, Greenfield Certified Grimm, No. 28-438..... Origin—Canada.	L 99.80 F 99.05	0.08 0.49	0.07 0.24	0.05 0.22	70-16 66-10	1/1949 6/1949	Purity below that stated. Weed Seed excessive.
432	Mangel Wurzel	H. K. Webster Co., Lawrence Mammoth Long Red..... Lot No. (*)	L * F 99.78	... ...	.. 0.22	... ...	80.00 78.00	1/1949 4/1949	*Required information not given.
990	Brome Grass	Eastern States Farmers' Exchange, Springfield, Mass. Eastern States Farmers' Exchange, Shelburne Falls Smooth, Lot No. (*).....	L 89.25 F 86.29	0.05 ...	10.60 13.69	0.10 0.02	85.00 93.00	1/1949 6/1949	*Required information not given. Purity below that stated. Inert Matter excessive.
327	Forage Oats	Eastern States Farmers' Exchange, Waltham Variety Unknown, No. 477.....	L 97.50 F 94.97	0.50 0.19	0.20 0.02	1.80 4.82	90.00 97.00	1/1949 6/1949	Purity below that stated. Other Crop Seed excessive.
720	Brome Grass	Joseph Harris Co., Inc., Rochester, N. Y. Joseph Harris Co., Inc., Lexington No. 2861.....	L 90.39 F 87.18	0.01 ...	9.44 12.43	0.16 0.39	92.00 95.00	3/1949 6/1949	Purity below that stated. Inert Matter excessive.

Table I.—Results of Inspection and Analyses of Field Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1025	Corn	The Page Seed Co., Green, N. Y. A. W. Baldwin & Co., West Stockbridge Golden Sweepstakes, No. 9017 Origin (*)	L 98.00 F 99.30	...	2.00 0.70	...	90.00 85.00	3/1949 6/1949	*Required information not given.
863	Corn	Haley's Grain Store, Palmer Longfellow Flint, No. 9052 Origin (*)	L 98.00 F 99.12	...	2.00 0.88	...	90.00 88.00	3/1949 5/1949	*Required information not given.
689	Rye	Lawrence Bros., Falmouth **Spring, No. J 192848	L 98.09 F 99.01	...	1.80 0.69	0.11 0.30	90.00 84.00	10/1948 6/1949	**Variety required unless there is a statement "Variety Unknown." "Spring" is not a variety.
688	Vetch	Hairy or Winter, No. J 17 7449	L 95.00 F 99.71	0.25 ...	0.75 0.13	4.00 0.16	72-8 51-7	10/1948 6/1949	Germination below that stated.
468	Oats	Park & Pollard Co., Buffalo, N. Y. Ellison Coal & Grain Co., Bradford **Swedish Select Type, No. (*)	L 97.00 F 99.32	0.20 0.01	0.20 0.25	2.60 0.42	90.00 90.00	3/1949 6/1949	**Variety required unless there is a statement "Variety Unknown." "Type" not acceptable. *Required information not given.
976	Timothy	Wm. G. Scarlett & Co., Baltimore, Md. Franklin Farmers Supply Co., Greenfield No. 7042	L 99.50 F 99.32	0.10 0.23	0.30 0.34	0.10 0.11	90.00 68.00	1/1949 6/1949	Germination below that stated.
S-2	Rye	Grafton State Hospital, No. Grafton Rosen, No. 4505	L 98.00 F 99.20	0.20 0.04	1.00 0.19	0.80 0.57	80.00 79.00	8/1948 9/1948	Noxious weeds not declared, but 26 Corn Cockle per lb. found.
S-1	Rye	Worcester State Hospital, Worcester Rosen, No. 4105	L 98.00 F 99.21	0.20 0.09	1.00 0.28	0.80 0.42	80.00 77.00	8/1948 9/1948	Noxious Weeds not declared, but 27 Corn Cockle per lb. found.

The Clapper Co., West Newton, Mass.									
927	Premier Mixture, Lot No. (*)	.....	L	96.01	0.34	3.54	0.10	1/1949	*Required information not given.
			F	.....	0.39	3.60	.....	6/1949	Components not listed in order of predominance.
Components:									
	Colonial Bent	4.82		90.00	5.38	84.00			Germination below that stated.
	Chewings Fescue	19.70		90.00	18.28	60.00			
	Kentucky Bluegrass	17.00		30.00	18.94	80.00			
	Meadow Fescue	4.93		91.00	3.08	97.00			
	Perennial Ryegrass	9.87		95.00	10.07	92.00			
	Italian Ryegrass	19.80		92.00	18.04	92.00			
	Timothy	19.90		90.00	22.22	88.00			
Arthur R. Cone, Buffalo, N. Y.									
322	General Mills, Inc., Farm Service Div., Ayer Anchor Lawn Mixture, Lot No. (*)	.....	L	93.45	0.50	10.72	1.00	2/1949	*Required information not given.
			F	.....	0.61	5.79	0.15	5/1949	
Components:									
	Kentucky Bluegrass	26.40		75.00	29.25	78.00			
	Domestic Ryegrass	20.78		90.00	19.59	95.00			
	Redtop	16.00		90.00	18.66	90.00			
	Chewings Fescue	9.80		90.00	9.75	96.00			
	Timothy	9.80		85.00	10.67	44.00			Germination below that stated.
	White Clover	5.00		70-20	5.53	56-42			Germination below that stated.
Doughten Seed Co., Jersey City, N. J.									
436	Fred F. Smith, Inc., Reading Island Green Mixture, No. 949	.....	F	90.48	0.60	8.13	0.40	1/1949	
			L	.....	0.24	8.84	0.44	5/1949	
Components:									
	Common Ryegrass	40.70		90.00	38.60	92.00			Germination below that stated.
	Timothy	40.65		72.00	41.40	51.00			
	Redtop	7.27		82.00	7.68	80.00			
	Bluegrass	2.25		75.00	.....	84.00			"Bluegrass" not sufficient.
	Canada Bluegrass	.....		.....	2.24	.....			2.24% Canada Bluegrass found.
	Kentucky Bluegrass	.....		.....	0.56	63.00			0.56% Kentucky Bluegrass found.
Danvers Supply Co., Danvers									
438	Choice Clover Mixture, No. 3377, AMS 43	.....	L	98.79	0.64	0.69	0.34	2/1949	Percentage below that stated.
			F	.....	0.55	0.39	0.27	5/1949	Germination and hard seeds not stated separately.
Components:									
	White Clover	63.23		90.00	35.19	80-11			Percentage exceeds that stated.
				Inc. H.S.					Germination and hard seeds not stated separately.
	Suckling Clover	35.10		89.00	63.60	60-35			Germination and hard seeds not stated separately.
				Inc. H.S.					

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found							
231	J. Oliver Johnson Seed Co., Chicago 22, Ill. Decature & Hopkins Co., Boston West Parks Mixture, No. J 1191				L	1.00	6.85	0.50	1/1949	
					F	0.45	7.61	0.79	4/1949	
	Components:									
	Timothy.....	49.50	48.28	80.00						
	Domestic Ryegrass.....	34.65	33.90	90.00						
	Fancy Redtop.....	7.00	8.29	90.00	78.00					Germination below that stated.
	White Clover.....	0.50	0.68	75-15	70-15					
249	D. Landreth Seed Co., Philadelphia, Pa. Worcester Grain Co., Worcester Popular Mixture, No. 105				L	0.44	1.85	0.54	1/1949	
					F	0.12	2.34	0.51	4/1949	
	Components:									
	Timothy.....	35.85	37.08	90.00	74.00					Germination below that stated.
	Domestic Ryegrass.....	29.70	28.35	90.00	94.00					
	Perennial Ryegrass.....	14.70	15.00	90.00	94.00					
	Kentucky Bluegrass.....	10.20	9.42	80.00	87.00					
	Bent Grass.....	5.62	6.07	90.00	85.00					
	White Dutch Clover.....	1.10	1.11	90.00	67-25					
256	Special Shady Mixture, No. 108				L	0.49	2.46	0.52	1/1949	
					F	0.41	1.63	...	5/1949	
	Components:									
	Domestic Ryegrass.....	24.75	22.63	90.00	96.00					Percentage exceeds that stated.
	Chewings Fescue.....	24.50	33.90	90.00	90.00					Percentage below that stated.
	Meadow Fescue.....	17.64	8.17	90.00	91.00					Percentage exceeds that stated.
	Perennial Ryegrass.....	14.70	20.99	90.00	96.00					Percentage exceeds that stated.
	Kentucky Bluegrass.....	8.50	8.34	80.00	84.00					Percentage below that stated.
	Bent Grass.....	6.44	4.03	90.00	88.00					"Bent" not sufficient—Highland Bent found.
410	Ostberg Seed Co., Chicago, Ill. Sears, Roebuck & Co., Lawrence Cross Country Shady Mixture, No. OD 750				L	0.35	7.68	0.20	1/1949	
					F	0.40	3.52	0.06	5/1949	

Components:									
Domestic Ryegrass.....	29.40	28.35	85.00	94.00					
Fimothy.....	19.80	21.87	70.00	63.00					
Meadow Fescue.....	19.40	17.31	85.00	60.00					Germination below that stated.
Kentucky Bluegrass.....	8.00	10.05	80.00	84.00					Percentage exceeds that stated.
Redtop.....	5.70	12.91	75.00	84.00					
F. H. Woodruff & Sons, Inc., Milford, Conn.									
John J. Gallagher, Inc., Quincy					L	92.44	0.50	6.60	3/1949
Royal Mixture, No. 30-194.....					F		0.35	7.21	6/1949
Components:									
Red Fescue.....	34.20	34.33	80.00	94.00					
Kentucky Bluegrass.....	27.20	27.35	80.00	62.00					Germination below that stated.
Perennial Ryegrass.....	16.50	15.28	90.00	90.00					
Common Ryegrass.....	7.70	6.95	90.00	90.00					
Redtop.....	4.50	...	90.00	...					
Mixed Bent.....	2.80	...	90.00	...					
Agrostis spp.....	...	8.33	...	85.00					
(Redtop, Velvet and Highland Bents)									

Table 3.—Results of Inspection and Germination of Vegetable Seeds
Sections 261 B2 and 261 C.

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety and the name and address of the person who labeled such seed or who sells, offers or exposes it for sale. For seeds which germinate less than the Massachusetts Standard the label must also show the percentage of germination exclusive of hard seeds, percentage of hard seeds if present, calendar month and year the test was completed and the words "Below Standard" in not less than 8 point type. Date of test shall not be over nine months old, exclusive of the month in which the test was completed. Seed may not be sold or offered for sale which has a false or misleading label.

Six hundred and one samples of vegetable seeds were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of the law.

The wholesaler's name, in all instances, and the germination for those samples of seed found below standard in germination are in boldface type. In samples for which the found germination is not in boldface, the germination is above standard but below the germination stated.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
Associated Seed Growers, Inc. New Haven, Conn.							
Essex Co. Cooperative Farming Assoc., Topsfield							
87	Lettuce	New York No. 12.....	86	7/1948	58	4/1949	80
94	Onion	Early Yellow Globe.....	78	11/1948	56	4/1949	70
91F	Spinach	Bloomsdale Savoy Long Standing No. 99546 B.....	75	11/1948	65	4/1949	60
W. Allee Burpee Co., Philadelphia, Pa.							
Clinton Hardware & Auto Supply Co., Clinton							
934	Leek	Broad London.....	70	12/1948	38	5/1949	60
933F	Spinach	Bloomsdale Long Standing.....	70	12/1948	26	6/1949	60
C. B. Coburn Co., Lowell.							
278	Parsnip	Long Smooth Hollow Crown....	70	11/1948	10	4/1949	60
Comstock, Ferre & Co., Welbersfield, Conn.							
Joseph Sordillo & Sons, Boston							
12F	Spinach	Savoy Leaved Long Standing—	89	12/1948	76	4/1949	60
Arthur R. Cone, Buffalo, N. Y.							
H. K. Webster Co., Lawrence							
424F	Beet	Crosby's Egyptian.....	81	1/1949	66	4/1949	65
Henry A. Drcer, Inc., Philadelphia, Pa.							
Gardner State Hospital, East Gardner							
S-294	Endive	Full Hearted Batavian, No. 367.	80	1/1949	53	4/1949	70
Massachusetts Reformatory, West Concord							
S-175	Celery	Summer Pascal, No. 288.....	70	12/1948	2	4/1948	55
Metropolitan State Hospital, Waltham							
S-167F	Spinach	Bloomsdale Long Standing Savoy, No. 315.....	70	1/1949	42	4/1949	60
Taunton State Hospital, Taunton							
S-144	Celery	Summer Pascal, No. 288.....	70	12/1948	2	4/1949	55
Worcester State Hospital, Worcester							
S-245F	Spinach	Bloomsdale Long Standing Savoy, No. 315.....	70	1/1949	55	4/1949	60

Table 3.—Results of Inspection and Germination of Vegetable Seeds.—Concluded.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
568	Broccoli	Thomas J. Grey Co., Weymouth, Mass. Italian Green Sprouting.	—	—	55	5/1949	75
1093	Onion	Charles C. Hart Seed Co., Wethersfield, Conn. A. T. Chase Corp., Dedham Yellow Globe Danvers.	70	1/1949	47	6/1949	70
53	Cabbage	Pierce Hardware Co., Taunton Drumhead Savoy, No. 1325.	91	11/1948	68	4/1949	75
54	Cabbage	Golden Acre, No. 1042.	91	11/1948	79	4/1949	75
56	Cabbage	Penn State Ball Head, No. 781	85	11/1948	63	4/1949	75
55	Chinese Cabbage	Chihili, No. 509	94	11/1948	83	4/1949	75
63	Lettuce	Big Boston Head B.	92	11/1948	81	4/1949	80
64	Lettuce	N. Y. Head No. 12, No. 640.	88	11/1948	69	4/1949	80
62	Lettuce	N. Y. Head, No. 615 B.	92	11/1948	71	4/1949	80
554	Lettuce	Budd D. Hawkins, Reading, Vt. I. B. Barrows Co., Worcester Iceberg.	80	12/1948	63	5/1949	80
452F	Beans	Merrimac Valley Nurseries, Haverhill, Mass. Tendergreen.	85	2/1949	66	4/1949	75
454F	Beet	Asgrow Wonder.	88	2/1949	60	5/1949	65
457	Cabbage	Marion Market.	88	2/1949	72	5/1949	75
453F	Carrot	Hutchinson.	85	2/1949	63	4/1949	55
456	Onion	Ea. Yellow Globe.	85	2/1949	61	4/1949	70
458F	Rutabaga	Long Island Improved.	88	2/1949	40	4/1949	75
1030	Onion	The Page Seed Co., Greene, N. Y. E. A. Noble & Co., Stockbridge Prizetaker.	App. 75	12/1948	58	6/1949	70
965	Radish	Joseph Sordillo & Sons, Boston, Mass. Round White.	—	—	47	5/1949	75
369	Pepper	The Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission) Washington School, Taunton Ruby King.	—	—	30	5/1949	55
50	Lettuce	F. H. Woodruff & Sons, Milford, Conn. Waldron Hardware Co., Taunton N. Y. Head No. 12, No. 1-5480C	App. 84	10/1948	0	4/1949	80
S-176	Cauliflower	S. D. Woodruff & Sons, Orange, Conn. Massachusetts Reformatory, West Concord Early Snowball, No. 3341.	85	12/1948	72	4/1949	75
S-243F	Spinach	Worcester State Hospital, Worcester Blight Resistant, No. 74353.	90	11/1948	62	4/1949	60

Table 4.—Summary of Inspection

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Associated Seed Growers, Inc. New Haven, Conn.	55	52	3	4	3	1			
Belt Seed Co. Baltimore, Md.				4	4	0			
Boston Market Gardener's Assoc. Boston, Mass.	2	2	0						
Breck, Joseph, & Sons. Boston, Mass.	27	27	0				1	1	0
Burpee, W. Atlee, Co. Philadelphia, Pa.	45	42	3	2	1	1	2	0	2
Cargill, Inc. Minneapolis, Minn.				1	1	0			
The Clapper Co. West Newton, Mass.	6	6	0				1	0	1
Cleveland Grain Co. Cleveland, Ohio				1	1	0			
Comstock, Ferre & Co. Wethersfield, Conn.	31	30	1	1	1	0	1	1	0
Cone, Arthur R. Buffalo, N. Y.	15	14	1	53	46	7	3	2	1
Cox, Charles M., Co. Boston, Mass.				2	2	0			
Craver Dickinson Co. Buffalo, N. Y.				1	1	0			
Crossman Seed Corp. Rochester, N. Y.	7	7	0						
Delta Sales Corp. Delta, Pa.				1	1	0			
Dickinson, Albert, Co. Chicago, Ill.				2	2	0			
Doughten Seed Co. Jersey City, N. J.				2	2	0	1	0	1
Dreer, Henry A., Inc. Philadelphia, Pa.	14	9	5						
Eastern States Farmers' Exchange Springfield, Mass.	30	30	0	12	10	2	1	1	0
Empire Seed Co. Fredonia, N. Y.	2	2	0						
Ferry-Morse Seed Co. Detroit, Mich.	10	10	0						
Fox, Richard S., Jr. Winchester, Ky.				1	1	0			
Fredonia Seed Co. Fredonia, N. Y.	14	14	0				1	1	0
Garfield, Williamson Co. Jersey City, N. J.				1	1	0	1	0	1
Grey, Thomas J., Co. Weymouth, Mass.	15	14	1						
Harris, Joseph, & Co. Rochester, N. Y.	11	11	0	2	1	1			
Hart, Charles C., Seed Co. Wethersfield, Conn.	48	40	8				1	1	0
Hawkins, Budd D. Reading, Vt.	11	10	1						
Johnson, J. Oliver, Seed Co. Chicago, Ill.							3	2	1
Landreth, D., Seed Co. Philadelphia, Pa.	5	5	0				3	1	2
Larroe Mills, Inc. Cohocton, N. Y.				1	1	0			
Lyon, John D., Inc. Waltham, Mass.							2	2	0
Merrimac Valley Nurseries Haverhill, Mass.	8	2	6						
Michael-Leonard Seed Co. Chicago, Ill.	8	8	0						
Northrup, King & Co. Minneapolis, Minn.	12	12	0	1	1	0			

Table 4.—Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Ostberg Seed Co. Chicago, Ill.				1	1	0	4	1	3
The Page Seed Co. Greene, N. Y.	14	13	1	20	16	4	1	1	0
Park & Pollard Co. Buffalo, N. Y.				1	0	1			
Patten, Geo. Seed Co. Jersey City, N. J.							2	2	0
Pedigreed Seed Co. New York, N. Y.							2	1	1
Perry Seed Co. Boston, Mass.	25	25	0						
Philadelphia Seed Co. Philadelphia, Pa.							2	0	2
Ralston Purina Co. St. Louis, Mo.	5	5	0						
Rice, J. B., Jr., Inc. Shushan, N. Y.	10	10	0						
Ross Bros. Co. Worcester, Mass.	16	16	0						
Scarlett, Wm. G., & Co. Baltimore, Md.				16	13	3	2	1	1
Scott, O. M., Seed Co. Marysville, Ohio							1	1	0
Sordillo, Joseph, & Sons Boston, Mass.	7	6	1						
Stanford Seed Co. Buffalo, N. Y.				23	22	1	1	1	0
Templin Bradley Co. Cleveland, Ohio	12	11	1						
Vaughan's Seed Store New York, N. Y.	8	8	0						
Webster, H. K., & Co. Lawrence, Mass.				1	0	1			
Whitney Seed Co. Buffalo, N. Y.				36	31	5	2	2	0
Woodruff, F. H., & Sons Milford, Conn.	77	76	1	1	1	0	2	1	1
Woodruff, S. D., & Sons Orange, Conn.	51	49	2	2	2	0	2	2	0
TOTALS	601	566	35	193	166	27	42	25	17

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted by the Department of Olericulture and the Seed Laboratory

Waldo C. Lincoln, Jr., Laboratory Assistant

W. H. Lachman, Assistant Research Professor—Consultant

This is the fourteenth year that the Experiment Station has run field tests to determine the trueness to type of various kinds of vegetable seeds offered for sale in this State. The State Seed Inspector purchased 299 samples of beans, beets, carrots, corn, rutabagas, spinach, and turnips for trial in field test plots in order to compare plant characteristics with the labeled variety name. Planting was done on May 23, 24, 25, and 26 and growing conditions were excellent, except for spinach, for which growing temperatures were too high. Therefore, results for spinach are not recorded in this report. Dry weather did not affect the seed trials as the plots were located in a moist area of the trial grounds.

Conformity to type was the measure of comparison in the tests, and individual plants were called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration. Yield records were not taken nor were replications of plantings made. The large number of lots made this impossible.

The source of seed is given together with remarks on conformity to type, except that those lots of seed which were tested in the field and found 100 percent true-to-type are not included in this table.

Field Test of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., New Haven, Conn.				
Essex Co. Cooperative Farming Assoc., Topsfield				
79 F	Beet	Detroit Dark Red, No. 57072.....	97	3% tapering roots
83 F	Carrot	Danvers Red Cored.....	96	4% pointed roots
99 F	Corn	Carmelcross, No. 76141.....	70	30% tassellate ears
95 F	Turnip	Purple Top White Globe.....	94	6% lacking purple top
96 F	Turnip	White Milan.....	94	2% all purple—4% Purple Top White Globe
W. G. Pearce & Co., Fall River				
19 F	Turnip	White Egg, No. 70582.....	90	10% globe shape
20 F	Turnip	White Egg, No. 90625.....	86	14% globe shape
Sears, Roebuck & Co., Lawrence				
414 F	Carrot	Imperator.....	95	5% split flesh
415 F	Turnip	Purple Top Strap Leaf.....	76	24% all white
417 F	Turnip	Purple Top White Globe.....	94	6% lacking purple top—mottled over all turnip on 50%—fair strain
Sears, Roebuck & Co., Quincy				
587 F	Beet	Detroit Dark Red.....	98	2% oblong
588 F	Radish	Early Scarlet Globe, No. 4277.....	98	2% pink rooted—development all in top growth—poor strain
Shurtleff Hardware Co., Middleboro				
227 F	Radish	French Breakfast.....	96	4% semi-globe shape
Joseph Breck & Sons, Boston, Mass.				
875 F	Radish	Long Scarlet Short Top.....	68	32% French Breakfast
876 F	Radish	French Breakfast.....	98	2% globe shape
877 F	Rutabaga	White Cape.....	92	8% American Purple Top
879 F	Turnip	White Egg.....	94	4% Purple Top—2% globe shape
880 F	Turnip	Purple Top White Globe.....	94	6% lacking purple top
D'arruda General Store, Somerset				
140 F	Radish	Scarlet Globe, No. 27.....	96	4% long cylindrical
W. Atlee Burpee Co., Philadelphia, Pa.				
Clinton Hardware & Auto Supply Co., Clinton				
930 F	Radish	Sparkler.....	99	1% White Icicle
932 F	Turnip	Purple Top White Globe.....	72	26% all white—2% all purple
C. B. Coburn Co., Lowell				
281 F	Radish	French Breakfast, No. 907.....	98	2% semi-globe shape
282 F	Radish	Scarlet Globe, No. 883.....	20	80% went to seed without proper root development
279 F	Rutabaga	Burpee's Purple Top Yellow.....	92	4% Macomber—4% Purple Top White Globe Turnip
280 F	Turnip	Purple Top White Globe, No. 1163.....	79	17% lacking purple top—4% all purple
Palm Grain Co., Lowell				
263 F	Beet	Crosby's Egyptian, No. 629.....	89	11% globular rooted
The Clapper Co., West Newton, Mass.				
918 F	Radish	Scarlet Globe.....	98	2% slightly tapering; otherwise an excellent strain
919 F	Rutabaga	American Purple Top.....	96	4% all yellow
921 F	Turnip	Golden Globe.....	96	4% tapered root
Comstock, Ferre & Co., Wethersfield, Conn.				
Phaneuf & Son, New Bedford				
159 F	Turnip	White Egg.....	82	12% globe shape—6% Purple Top
Joseph Sordillo & Sons, Boston				
8 F	Beet	Detroit Dark Red.....	94	6% oblong roots
9 F	Beet	Crosby's Egyptian.....	0	100% short topped—10% tapered roots—weak strain
16 F	Carrot	Improved Long Orange.....	98	2% yellow flesh

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Arthur R. Conc, Buffalo, N. Y.				
424 F	Beet	H. K. Webster Co., Lawrence Crosby's Egyptian.....	94	6% tapered roots
428 F	Radish	Scarlet Globe (Market Garden Strain)	90	8% tapering—2% pink rooted
431 F	Rutabaga	American Purple Top.....	92	8% Purple Top White Globe Turnip
430 F	Turnip	Purple Top Strap Leaf.....	89	11% all white; remainder very good strain
Henry A. Dreer, Inc., Philadelphia, Pa.				
S-129 F	Radish	Bridgewater State Farm, Bridgewater Early Scarlet Globe, Short Top No. 306.....	92	8% long top
Eastern States Farmers' Exchange, Inc., Springfield, Mass.				
Eastern States Farmers' Exchange, Inc., Waltham				
337 F	Beet	Perfected Detroit, No. 719.....	98	2% tapered roots
340 F	Radish	Sparkler White Tip, No. 615.....	94	6% were 50% white or better
342 F	Rutabaga	Alburger, No. 1016.....	92	8% Purple Top White Globe Turnip
Ferry-Morse Seed Co., Detroit, Mich.				
889 F	Turnip	Drive-In Fruitland, Boston Purple Top White Globe.....	84	12% all purple—4% tapered roots
907 F	Turnip	J. J. Newberry Co., Framingham Purple Top White Globe.....	88	12% lacking purple top
Fredonia Seed Co., Fredonia, N. Y.				
Standard Paint & Wall Paper Co., Worcester				
526 F	Carrot	Chantenay.....	98	2% tapered roots
529 F	Radish	French Breakfast.....	88	8% showed no white on tip— 4% globe shape
528 F	Turnip	Purple Top Flat Strap Leaf.....	82	18% all white
Wood Square Hardware Co., Hudson				
948 F	Carrot	Oxheart.....	98	2% long tapered
949 F	Radish	French Breakfast.....	90	10% globe shape
950 F	Turnip	Purple Top Flat Strap Leaf.....	84	14% all white—2% globe shape
951 F	Turnip	Purple Top White Globe.....	76	18% all white—6% tapered roots
Thomas J. Grey Co., Weymouth, Mass.				
567 F	Beet	Early Wonder.....	74	10% tops all deep red—14% tops semi-red and green— 2% oblong shape
572 F	Turnip	Purple Top Strap Leaf.....	90	8% all white—2% globe shape
Joseph Harris & Co., Rochester, N. Y.				
Joseph Harris & Co., Lexington				
716 F	Beet	Detroit Dark Red, Special Strain, No. 501.....	97	3% oblong shape
710 F	Turnip	Purple Top White Globe, No. 644..	68	8% lacking purple top— 24% tapered roots
Charles C. Hart Seed Co., Wethersfield, Conn.				
Sunshine Feed Store, Bridgewater				
358 F	Beet	Crosby's Egyptian, No. 2500.....	88	12% tapered roots
360 F	Carrot	Imperator, No. 774.....	—	Center not orange all way through—plant type varied
Budd D. Hawkins, Reading, Vt.				
I. B. Barrows Co., Worcester				
549 F	Beet	Detroit Dark Red.....	94	6% tapered roots—light green tops—light red flesh
546 F	Carrot	Nantes Coreless.....	93	7% tapered end
553 F	Radish	New French Breakfast.....	86	8% showed no white on tip of root—6% tapering roots
548 F	Rutabaga	Improved Purple Top Yellow.....	88	4% Purple Top White Globe Turnip—4% White Egg— 4% Macomber

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
D. Landreth & Co., Philadelphia, Pa.				
251 F	Beet	Worcester Grain Co., Worcester Detroit Dark Red, No. 202.....	91	3% turnip shaped flat bottom—broad—6% strong thick taproot
Merrimac Valley Nurseries, Haverhill, Mass.				
454 F	Beet	Asgrow Wonder.....	96	2% tapered roots—2% oblong shape
453 F	Carrot	Hutchinson.....	98	2% yellow flesh
458 F	Rutabaga	Long Island Improved.....	96	4% all yellow
Northrup, King & Co., Minneapolis, Minn.				
896 F	Turnip	F. W. Woolworth Co., Quincy Purple Top White Globe.....	74	18% tapered roots—8% lacking purple top
The Page Seed Co., Greene, N. Y.				
216 F	Beet	J. H. Fairbanks Co., Bridgewater Detroit Dark Red, No. D2-1949....	92	8% tapered—development of strain poor
A. C. Samson, Inc., Marlboro				
955 F	Turnip	Purple Top White Globe.....	98	2% white
956 F	Turnip	Yellow Globe or Stone.....	96	4% Purple Top White Globe
Perry Seed Co., Boston, Mass.				
632 F	Beet	Crosby's Egyptian.....	81	8% tapered roots—11% predominant side hairs
633 F	Carrot	Hutchinson, No. 2144.....	98	2% blunt end
634 F	Radish	Arlington Long Scarlet, No. 5804....	98	2% pink in color
637 F	Turnip	Early Snowball, No. 7048.....	90	10% Purple Top White Globe
J. B. Rice, Jr., Inc., Shushan, N. Y.				
185 F	Carrot	F. X. Robichaud, Methuen Long Orange.....	96	4% yellow flesh
180 F	Turnip	Purple Top Strap Leaf.....	84	16% White Milan
Ross Bros. Co., Worcester, Mass.				
733 F	Radish	Early Scarlet Globe, No. 1815.....	94	6% tapering
734 F	Rutabaga	Long Island, Improved.....	92	4% all yellow—4% Purple Top White Globe Turnip
736 F	Turnip	White Egg, No. 2635.....	74	16% globe shape—8% Purple Top—2% tapered roots
The Templin Bradley Co., Cleveland, Ohio (The Children's Flower Mission) Washington School, Taunton				
376 F	Beet	Crosby's Egyptian.....	93	2% oblong—3% off-color—2% tapered roots
377 F	Radish	Long White Icicle.....	96	4% globe shape
368 F	Turnip	Purple Top White Globe.....	86	6% lacking purple top—4% all purple—4% tapered roots
Vaughan's Seed Store, New York, N. Y.				
350 F	Beet	Brown Grain Co., Concord Crosby's Egyptian, Selected, No. 1404.....	98	2% slightly tapered roots; remainder excellent strain
F. H. Woodruff & Sons, Inc., Milford, Conn.				
101 F	Radish	Farm Bureau Assoc., Waltham Early Scarlet Globe, No. 2-S41....	97	1% long tapering—2% pink in color
117 F	Turnip	Purple Top White Globe, No. 33830-C.....	80	20% lacking purple top
General Mills, Farm Service Div., Fall River				
121 F	Corn	Improved Golden Bantam, No. 34035	—	Mixed with Golden Cross Bantam
General Mills, Farm Service Div., No. Abington				
209 F	Beet	Detroit Dark Red, No. 33987.....	91	3% oblong—6% obovate

Field Tests of Vegetable Seeds—Concluded

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
F. H. Woodruff & Sons, Inc.—Continued				
194 F	Beet	Spence Hardware Co., Methuen. Crosby's Egyptian, No. 33871-C—	94	6% tapered roots
196 F	Radish	Crimson Giant, No. 2-664 C.....	10	90% showed no fleshy root development—very poor strain
198 F	Turnip	Purple Top White Globe, No. 33830-C.....	78	12% tapered roots—10% lacking purple top—very poor strain
S. D. Woodruff & Sons, Orange, Conn.				
S-225 F	Turnip	Bridgewater State Farm, Bridgewater Purple Top White Globe, No. 74512	75	20% tapering—5% lacking purple top
S-258 F	Beet	Grafton State Hospital, Grafton Detroit Dark Red, No. 84125.....	88	6% obovate—4% flat bottom (Crosby's Egyptian type) 2% oblong shape
Massachusetts Reformatory, West Concord				
S-308 F	Rutabaga	Long Island Improved, No. 94107..	96	4% Purple Top White Globe Turnip
Pires Hardware Co., Fall River				
236 F	Rutabaga	Long Island Improved, No. 94107..	96	4% Purple Top White Globe Turnip

STUDIES OF FLOWER SEEDS

Conducted by the Department of Floriculture

Clark L. Thayer, Professor

Waldo C. Lincoln, Jr., Laboratory Assistant

This is the fourteenth year in which flower seed studies have been conducted by the Department of Floriculture in conjunction with the Seed Laboratory to determine the quality of flower seeds offered for sale in various retail outlets. Seed of 268 lots, representing 54 genera, packeted by 27 wholesalers or distributors, were obtained from 45 retail sources by the Seed Inspector. Included in the retail sources were five retail seed stores with the remainder obtained from chain, hardware and grain stores. Five lots of perennials were collected but were not tested.

The lots were distributed among the various genera as follows:

Ageratum.....	6	Dianthus.....	3	Nemophila.....	2
Alyssum.....	10	Didiscus.....	1	Papaver.....	5
Anchusa.....	1	Dimorphotheca.....	3	Petunia.....	9
Antirrhinum.....	5	Eschscholtzia.....	3	Phlox.....	3
Arctotis.....	1	Gaillardia.....	6	Portulaca.....	7
Aster.....	1	Godetia.....	1	Reseda.....	4
Calendula.....	12	Gypsophila.....	5	Salpiglossis.....	1
Calliopsis.....	2	Helichrysum.....	4	Salvia.....	3
Callistephus.....	14	Iberis.....	5	Sanvitalia.....	1
Celosia.....	1	Impatiens.....	5	Scabiosa.....	7
Centaurea.....	6	Ipomoea.....	8	Statice.....	1
Chrysanthemum.....	6	Kochia.....	1	Tagetes.....	20
Clarkia.....	4	Linaria.....	1	Thunbergia.....	1
Cleome.....	2	Linum.....	1	Tithonia.....	1
Convolvulus.....	3	Lobelia.....	1	Tropaeolum.....	3
Cosmos.....	8	Lupinus.....	3	Venidium.....	1
Cynoglossum.....	4	Mathiola.....	3	Verbena.....	4
Delphinium.....	7	Mirabilis.....	4	Zinnia.....	39
				TOTAL.....	263

Dates of sowing were May 17, 18, and 19, a full month earlier than in most of the preceding thirteen years. Seeds were sown in twenty-foot sections in the row and in most cases, because of the small quantity of seed in a packet, it required the entire package of seed to plant the section; in some lots there were not enough seeds in a packet to plant the twenty-foot section.

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, regardless of the number of plants, with only one-third or less of the plants not true to form or color; "fair" between one-third and two-thirds not true; and not satisfactory if less than one-third was true to name. Lots which did not produce sufficient plants for providing satisfactory data are so indicated.

Since field germination tests are not up to the standards of germination tests conducted in the laboratory, this factor should be kept in mind when analyzing the results. It is impossible to control the conditions in the field which affect a reliable test of the viability of a seed and until work can be done in the laboratory and standards established, the type of field germination trial now being used is not a true test of the ability of the seed to germinate.

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Associated Seed Growers, Inc., Cambridge, N. Y.				
749 F	Ipomoea	Belanger, Inc., Spencer	Good	Satisfactory
750 F	Portulaca	Pearly Gates..... Single Mixed, Treated.....	Fair	Satisfactory; 8 colors 2% double
748 F	Zinnia	Super Giant Crimson Monarch	Poor	Too few plants for a performance test
Joseph Breck & Sons, Boston, Mass.				
656 F	Alyssum	Carpet of Snow 0106.....	Good	Satisfactory
655 F	Antirrhinum	Large Flowered Giant Cherry Ripe 0200.....	Poor	Satisfactory
662 F	Convolvulus Minor	Royal Ensign 1428.....	Fair	Satisfactory
654 F	Cosmos	Breck's Cupped Pink.....	Fair	Satisfactory; 5% white
663 F	Cynoglossum	Firmament 1540.....	Good	Satisfactory
660 F	Dianthus	Breck's Geisha Girl 1664.....	Poor	Too few plants for a performance test
657 F	Iberis	Breck's Giant White 1032....	Fair	Satisfactory
664 F	Petunia	Violet Blue Dwarf Bedding Admiral 2981.....	Fair	Satisfactory; 10% off color
661 F	Petunia	Radiance 2972.....	Poor	Satisfactory
658 F	Tagetes	Carnation Flowered Tall Yellow Supreme 2572....	Good	Satisfactory; 3 plants
659 F	Tagetes	Single French Red Head 2660.	Good	Satisfactory
665 F	Zinnia	Crown of Gold Pastel Shades . 4260.....	Good	Satisfactory; 6 shades
688 F	Zinnia	Dwarf Defiance Salmon Rose 4380.....	Good	Not satisfactory; 65% tall
666 F	Zinnia	Crimson Monarch Dahlia Flowered 4308.....	Good	Satisfactory
667 F	Zinnia	Golden Dawn Dahlia Flowered	Good	Satisfactory
W. Atlee Burpee Co., Philadelphia, Pa.				
Clinton Hardware & Auto Supply Co., Clinton				
939 F	Centaurea	Mixed Colors.....	Good	Satisfactory; 4 colors
937 F	Cosmos	Sensation Mixed Ea. Bloom....	Good	Satisfactory; 3 colors
938 F	Eschscholtzia	Cal. Poppy Monarch Mixed....	Fair	Satisfactory; 6 colors
836 F	Impatiens	Camellia-Double Flowered All Colors.....	Good	Satisfactory; 4 colors; 10% single
935 F	Salvia	Scarlet Sage Splendens.....	Poor	Satisfactory
Glazier & Fox, Inc., Haverhill				
470 F	Calendula	Yellow Colossal.....	Fair	Satisfactory
471 F	Portulaca	Single Mixed.....	Poor	Satisfactory; 9 colors
Harding Street Grain Store, Worcester				
539 F	Petunia	Large Single Bedding Mixed, Burpee's Floribunda....	Good	Satisfactory; 6 colors
538 F	Scabiosa	Blue, White, Pink Shades....	Fair	90% White—10% Pink, no blue
540 F	Zinnia	Burpee's Gigantic Colossal Chrysanthemum Flowered Mixed.....	Fair	Satisfactory
McClellan's Store, Hyannis				
698 F	Tagetes	Carnation-Chrysanthemum & Peony Flowered Mixed.....	Good	Satisfactory; 3 colors
J. B. Sibley & Son, Ware				
760 F	Ipomoea	Heavenly Blue.....	Good	Satisfactory
759 F	Scabiosa	Blue White Pink Shades.....	Fair	Satisfactory
758 F	Zinnia	Burpee Lilliput Mixed Colors.	Good	Satisfactory; 7 colors
Butler Bros. Co., Chicago, Ill.				
Ben Franklin Stores, Arlington				
726 F	Clarkia	Double Mixed.....	Fair	Satisfactory; 4 colors
728 F	Delphinium	Lustrous Carmine.....	Fair	Satisfactory
727 F	Mathiola	Beauty of Nice.....	Good	Incomplete; had not flowered Sept. 24
730 F	Petunia	Flaming Velvet.....	Poor	Satisfactory; 2% Violet King
729 F	Zinnia	Fantasy Mixed.....	Good	Satisfactory; 7 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
The Clapper Co., Newton, Mass.				
922 F	Tagetes	Signata Pumila.....	Good	Satisfactory
924 F	Thunbergia	Mixed.....	Good	Satisfactory
923 F	Venidium	Fastuosum.....	Good	Satisfactory
926 F	Zinnia	Wildfire Fantasy.....	Poor	Satisfactory; 3 colors
Crosman Seed Corp., East Rochester, N. Y.				
S. S. Kresge Co., Quincy				
619 F	Aster	Tahoka Daisy.....	None	
625 F	Callistephus	Giant Crego White.....	Poor	Satisfactory
620 F	Cleome	Spider Plant—Pink Queen.....	Good	Satisfactory
623 F	Godetia	Duke of York Double Rose & Crimson Color.....	Fair	Too few plants for a performance test
617 F	Gypsophila	Pink.....	Good	Satisfactory
618 F	Helichrysum.	Mixed Colors.....	Poor	Satisfactory; 5 colors
622 F	Phlox	Drummond's Mixed Colors.....	Poor	Satisfactory; 7 colors
621 F	Reseda	Mignonette Large Flowering Sweet.....	Good	Satisfactory
616 F	Tagetes.....	Guinea Gold.....	Fair	Satisfactory
624 F	Tagetes	Signata Pumila.....	Good	Satisfactory
615 F	Verbena.....	Giant Scarlet.....	Poor	Too few plants for a performance test
614 F	Zinnia	Pompon or Lilliput.....	Good	Satisfactory; 7 colors
B. F. Leader, Springfield				
806 F	Cosmos	Radiance Deep Rose & Scarlet	Good	Satisfactory
805 F	Nemophila	Baby Blue Eyes.....	Good	Satisfactory
804 F	Tagetes	Giant African Orange All Double.....	Good	Satisfactory
803 F	Zinnia	Dwarf Pompon or Lilliput Mixed.....	Good	Satisfactory; 6 colors
807 F	Zinnia	Fantasy Mixed Colors.....	Fair	Satisfactory; 6 colors
Deerington Zinnia Gardens, Bargersville, Ind.				
J. J. Newberry Co., Framingham				
910 F	Zinnia	Baby Bee Small Mixed Colors.....	Fair	Satisfactory; 13 colors
909 F	Zinnia	Double Bloom Mixed Colors.....	None	
908 F	Zinnia	Pride of Indiana Red Dark Velvety Red to Scarlet.....	Fair	Satisfactory—Dark Velvety Red to Scarlet
Empire Seed Co., Fredonia, N. Y.				
Fruitland, Springfield				
812 F	Calendula	Double Mixed Colors.....	Poor	Satisfactory; 3 colors
811 F	Chrysanthemum	Mixed Colors.....	Poor	Satisfactory; 4 colors
810 F	Cosmos	Early Mammoth Mixed Colors	Good	Satisfactory; 3 colors
813 F	Zinnia	Giant Dahlia Flowered Mixed Colors.....	Fair	Satisfactory; 6 colors
Ferry-Morse Seed Co., Detroit, Mich.				
Drive-In Fruitland, Boston				
886 F	Alyssum	Violet Queen.....	Good	Satisfactory; 2% Carpet of Snow
884 F	Calendula	Gold Lemon Queen.....	Poor	Satisfactory
883 F	Portulaca	Double Mixed.....	Good	Not satisfactory; 10 colors; 70% single
885 F	Tagetes	Harmony Hybrids Dwarf Mixed.....	Good	Satisfactory; 7 types
Granite City Hardware Co., Quincy				
613 F	Ipomoea	Heavenly Blue.....	Poor	Satisfactory
611 F	Verbena	Fine Mixed.....	Poor	Too few plants for a performance test
612 F	Zinnia	Cherry Queen, Bright Rose...	Fair	Satisfactory
B. F. Leader, Springfield				
802 F	Calendula	Orange King.....	Fair	Satisfactory
801 F	Dimorphotheca	African Daisy.....	Good	Satisfactory; 4 colors
Miller's Florist & Nursery, Arlington				
704 F	Mirabilis	Four O'Clock Mixed.....	Good	Satisfactory; 4 colors
705 F	Petunia	Violet King.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Ferry-Morse Seed Co.—Continued				
905 F	Cynoglossum	J. J. Newberry Co., Framingham Chinese Forget-me-not Firmament	Good	Satisfactory
904 F	Papaver	Double Shirley Sweet Briar	Good	Satisfactory; 3% single
906 F	Scabiosa	Giant Annual Mixed	Poor	Too few plants for a performance test
903 F	Zinnia	Cupid Tiny Tim Bright Scarlet Double	Good	Satisfactory
Fredonia Seed Co., Fredonia, N. Y.				
742 F	Antirrhinum	Robbins Bros., Co., Worcester Univ. of Cal. Mixed	Poor	Too few plants for a performance test
745 F	Calendula	Double Orange King	Good	Satisfactory
741 F	Gaillardia	Picta Single Mixed	Poor	Satisfactory
744 F	Iberis	Candytuft Umbellata Mixed	Poor	Too few plants for a performance test
743 F	Lupinus	Finest Mixed	Fair	Satisfactory; 3 colors
Standard Paint & Wall Paper Co., Worcester				
532 F	Ageratum	Blue Perfection	Fair	Satisfactory
533 F	Zinnia	Dahlia Flowered Illumination	Good	Satisfactory
Thomas J. Grey Co., Weymouth, Mass.				
586 F	Arctotis	Blue-eyed African Daisy	Poor	Satisfactory
578 F	Calendula	New Double Persimmon	Fair	Satisfactory; 2% single
57 F	Callistephus	Princess Linda	Fair	Satisfactory
575 F	Cleome	New Golden	None	
577 F	Cosmos	Single Sensation Purity	Good	Satisfactory
585 F	Delphinium	Double Giant Imperial Mixed	Poor	Too few plants for a performance test
582 F	Dimorphotheca	African Daisy Mixed Colors	Good	Satisfactory; 4 colors
583 F	Scabiosa	Loveliness	Poor	Too few plants for a performance test
579 F	Tagetes	Miniature Yellow Pygmy	Good	Satisfactory
581 F	Tagetes	Red Head	Good	Satisfactory
584 F	Tagetes	Yellow Supreme	Good	Satisfactory; 1 plant orange flowers
580 F	Zinnia	Double Super Crown O'Gold Pastel Tints	Good	Satisfactory; 7 tints
Joseph Harris & Co., Rochester, N. Y.				
708 F	Alyssum	Joseph Harris & Co., Lexington Carpet of Snow	Good	Satisfactory
706 F	Chrysanthemum	Annual Mixed	Fair	Satisfactory; 3 colors
707 F	Helichrysum	Variety Mixture	Fair	Satisfactory; 6 colors
Charles C. Hart Seed Co., Wethersfield, Conn.				
398 F	Ageratum	Dean Hardware Co., Lawrence Blue Perfection	Fair	Satisfactory
399 F	Alyssum	Little Gem White	Fair	Satisfactory
396 F	Ipomoea	Improved Heavenly Blue	Good	Satisfactory
400 F	Mathiola	Finest Dwarf Mixed Ten Weeks	Poor	Incomplete; only 1 plant flowered
397 F	Portulaca	Single Mixed Colors	Poor	Satisfactory; 11 colors; 1% double
Hamilton & Atwater Co., Westfield				
791 F	Antirrhinum	Tall Giants, Mixed	Poor	Satisfactory; 3 colors
792 F	Delphinium	Finest Mixed	Poor	Satisfactory; 3 colors
793 F	Mathiola	Finest Dwarf Mixed Ten Weeks	Good	Incomplete; had not flowered Sept. 24
790 F	Mirabilis	Marvel of Peru Mixed Colors	Good	Satisfactory; 10 colors
795 F	Tagetes	Collaret Odorless Crown of Gold	Poor	Satisfactory
794 F	Tropaeolum	Dwarf Mixed Colors	Good	Satisfactory
Jeffway Hatch Co., Easthampton				
767 F	Lupinus	Hartwegii Mixed	Poor	Too few plants for a performance test
Mason's Farm Market, Springfield				
815 F	Mirabilis	Marvel of Peru Mixed Colors	Fair	Satisfactory; 6 colors
814 F	Zinnia	Lilliput Finest Mixed Dwarf	Good	Satisfactory; 9 colors
Nooney Hardware Co., East Longmeadow				
796 F	Calendula	Orange King	Good	Satisfactory; 6% yellow

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
746 F	Papaver	Robbins Bros. Co., Worcester Shirley Mixed Colors	Good	Satisfactory; 6 colors
751 F	Gaillardia	J. B. Sibley & Son, Ware Blanket Flower Mixed Colors	Poor	Incomplete; had not flowered Sept. 24
Budd D. Hawkins, Reading, Vt.				
518 F	Ipomoea	I. B. Barrows Co., Worcester Scarlet O'Hara	Good	Satisfactory
825 F	Antirrhinum	Franklin Hardware Co., Springfield Fine Mixed	Fair	Satisfactory; 2 colors
823 F	Tropaeolum	Gleam Hybrids Mixed Colors	Poor	Not satisfactory; only 2 colors
824 F	Zinnia	New Giant Dahlia-Flowered Scarlet	Fair	Satisfactory
H. V. Lawrence, Falmouth, Mass.				
683 F	Centaurea	Mixed	Good	Satisfactory; 5 colors
684 F	Delphinium	White King	Fair	Satisfactory
682 F	Gaillardia	Indian Chief	Poor	Satisfactory
681 F	Iberis	Candytuft Flesh Pink	Good	Satisfactory
685 F	Zinnia	Lilliput Black Ruby	Good	Satisfactory
Mandeville & King Co., Rochester, N. Y.				
840 F	Callistephus	Foster-Farrar Co., Northampton Lavender	Poor	Satisfactory; 1 plant pale lavender flowers
845 F	Cosmos	Radiance Two-Tone Rose & Crimson	Good	Satisfactory
841 F	Gypsophila	Pink	Good	Satisfactory
843 F	Papaver	Shirley Double Rose Pink	Good	Satisfactory
844 F	Petunia	Rose of Heaven Improved	Fair	Satisfactory
839 F	Tropaeolum	Mahogany Gem Dwarf Double Gleam	Good	Satisfactory; 5% Golden Gleam
842 F	Zinnia	Crown of Gold Pastel Tints Giants	Good	Satisfactory; 6 colors
Hyannis Hardware Co., Hyannis				
694 F	Calendula	Orange King	Good	Satisfactory
697 F	Clarkia	All Colors	Good	Satisfactory; 5 colors
692 F	Dianthus	Gaiety All Colors	Good	Satisfactory; 5 colors
696 F	Helichrysum	All Colors Strawflower	Fair	Satisfactory; 7 colors
695 F	Papaver	Shirley Single American Legion	Good	Satisfactory; 2% light
Jeffway Hatch Co., Easthampton				
764 F	Centaurea	Sweet Sultan All Colors	Poor	Too few plants for a performance test
761 F	Cynoglossum	Firmament	Good	Satisfactory
766 F	Helichrysum	Mixed Strawflower	Poor	Too few plants for a performance test
765 F	Iberis	Giant Hyacinth Flowered Candytuft	Fair	Satisfactory
763 F	Impatiens	All Colors	Poor	Satisfactory
762 F	Scabiosa	Rosette Mourning Bride	Poor	Satisfactory
Onset Lumber Co., Onset				
680 F	Centaurea	Red Boy	Fair	Satisfactory
679 F	Phlox	All Colors	Poor	Satisfactory; 6 plants; 5 colors
676 F	Tagetes	Dwarf Double French Bronzy Red	Good	Not satisfactory; 4 colors
677 F	Tagetes	Josephine Gold & Brown	Good	Satisfactory
678 F	Zinnia	Fantasy All Colors	Good	Satisfactory; 6 colors
O. B. Parks Co., Westfield				
782 F	Alyssum	Violet Queen	Good	Satisfactory; 2% Carpet of Snow; 2% Little Gem
783 F	Clarkia	Double All Colors	Good	Satisfactory; 3 colors
784 F	Linaria	Fairy Bouquet All colors	Good	Satisfactory; 8 colors
786 F	Lobelia	Crystal Palace Dwarf	Fair	Incomplete; had not flowered Sept. 24
785 F	Scabiosa	Peace	Fair	Satisfactory
Robbins Bros. Co., Worcester				
747 F	Zinnia	Will Rogers Scarlet Giant Dahlia Flowered	Good	Satisfactory; 10% pink

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Chas. C. Hart Seed Co.,—Continued				
J B. Sibley & Son, Ware				
752 F	Eschscholtzia	Cal. Poppy All Colors.....	Good	Not satisfactory; only 3 colors
754 F	Kochia	Burning Bush Summer Cypress	Fair	Satisfactory
755 F	Tagetes	Scotch Dwarf.....	Fair	Satisfactory
753 F	Tithonia	Mexican Sunflower Orange Scarlet.....	Good	Satisfactory
757 F	Verbena	All Colors.....	Poor	Satisfactory
756 F	Zinnia	Fantasy Scarlet Wildfire.....	Good	Satisfactory
C. K. Wanamaker & Co., Arlington Heights				
725 F	Ageratum	Lavender Blue.....	Fair	Satisfactory
722 F	Centaurea	Double Red Boy.....	Poor	Satisfactory
724 F	Cosmos	Sensation All Colors Giants...	Good	Satisfactory; 3 colors
721 F	Gaillardia	Indian Chief Bronzy Red Single	Poor	Too few plants for a performance test
723 F	Statice	All Colors.....	Poor	Too few plants for a performance test
Northrup, King & Co., Minneapolis, Minn.				
F. W. Woolworth Co., Quincy				
607 F	Ageratum	Imperial Dwarf Blue.....	Good	Satisfactory
601 F	Alyssum	Violet Queen.....	Fair	Satisfactory
609 F	Dimorphotheca	African Daisy Hybrids Mixed Colors.....	Good	Satisfactory; 3 colors
610 F	Gaillardia	Picta Indian Chief.....	Poor	Satisfactory
608 F	Ipomoea	Heavenly Blue.....	Good	Satisfactory
604 F	Linum	Scarlet Flax (L. Grandiflorum rubrum).....	Good	Satisfactory
600 F	Lupinus	Mixed.....	Fair	Satisfactory; 3 colors
605 F	Papaver.....	Shirley, Double Sweet Briar..	Fair	Satisfactory; 15% light pink; 15% single
602 F	Reseda	Sweet Scented R. Odorata....	Good	Satisfactory
603 F	Scabiosa	Blue Moon.....	Fair	Satisfactory
606 F	Zinnia	Cal. Giant Double White Purity.....	Good	Satisfactory; 8% pink
The Page Seed Co., Greene, N.Y.				
Firestone City Home & Auto Store, Northampton				
855 F	Ageratum	Page's.....	Fair	Satisfactory
849 F	Calendula	Radio Rich Glowing Orange..	Good	Satisfactory; 25% yellow; 10% non-quilled
848 F	Calliopsis..	Mixed Colors.....	Fair	Satisfactory; 6 colors
846 F	Callistephus	White Comet.....	Fair	Satisfactory
853 F	Chrysanthemum	Coronarium Double Mixed..	Good	Satisfactory; 5 colors
852 F	Clarkia	All Colors Mixed.....	Good	Satisfactory; 4 colors
850 F	Gypsophila	Baby's Breath.....	Good	Satisfactory
854 F	Ipomoea	Scarlet O'Hara.....	Fair	Satisfactory
847 F	Mirabilis	Four O'Clock Mixed Colors...	Good	Satisfactory; 8 colors
851 F	Petunia	Rosy Morn.....	Good	Satisfactory
Perry Seed Co., Boston, Mass.				
644 F	Alyssum	Carpet of Snow.....	Fair	Satisfactory
651 F	Anchusa	Blue Bird.....	Good	Satisfactory
643 F	Calendula	Pacific Beauty Mixture Pastel Shades.....	Fair	Satisfactory; 3 shades
649 F	Callistephus	Princess Linda Pure Clear Rose	Good	Satisfactory
653 F	Cosmos	Sensation Dazzler Deep Velvet Crimson.....	Good	Satisfactory
650 F	Didiscus.....	Cornelius Blue Lace Flower..	Good	Satisfactory
652 F	Gaillardia	Indian Chief Bronzy Red.....	Poor	Too few plants for a performance test
645 F	Impatiens	Balsam Bush Flowered Mixed	Fair	Satisfactory
646 F	Tagetes	Chrysanthemum Flowered Limelight Primrose Yellow	Fair	Satisfactory
648 F	Zinnia	Crown O'Gold Pastel Tints...	Good	Satisfactory; 7 colors
647 F	Zinnia	Early Wonder Mixed.....	Good	Satisfactory; 6 colors
Jerome B. Rice Seed Co., Cambridge N. Y.				
Church & Stowell Co., Wareham				
672 F	Calliopsis	Tall Finest Mixed.....	Good	Satisfactory; 5 colors
671 F	Callistephus	Shell Pink.....	Good	Satisfactory
673 F	Chrysanthemum	Annual Mixed.....	Poor	Incomplete; only 1 plant flowered
674 F	Tagetes	Signata Pumila.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Jerome B. Rice Seed Co.—Continued				
McClellan's Store, Hyannis				
699 F	Zinnia	Lilliput Mixed.....	Good	Satisfactory; 7 colors
700 F	Zinnia	Mexican Yellow & Bronze....	Fair	Satisfactory
Ross Bros. Co., Worcester, Mass.				
497 F	Alyssum	Carpet of Snow.....	Good	Satisfactory
498 F	Calendula	Yellow Colossal.....	Poor	Satisfactory
496 F	Callistephus	Super Giant Elmonte.....	Fair	Incomplete; 1 plant in flower Sept. 24
499 F	Convolvulus Minor	Dwarf Royal Ensign.....	Fair	Satisfactory
500 F	Cynoglossum	Firmament.....	Poor	Satisfactory
501 F	Gypsophila	Elegans Deep Rose.....	Good	Not satisfactory; 100% very light pink
503 F	Salvia	Bonfire.....	Good	Satisfactory
502 F	Tagetes	Dwarf Double Butterball....	Good	Satisfactory
505 F	Zinnia	Dahlia Flowered Exquisite...	Good	Satisfactory
504 F	Zinnia	Mammoth White.....	Good	Satisfactory; 2% pink
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Quincy				
592 F	Antirrhinum	Rust Resistant Mixed.....	Poor	Satisfactory; 3 colors
599 F	Callistephus	Giant Ostrich Plume Mixed....	Fair	Satisfactory; 7 colors
599 F-A	Callistephus	Giant Branching Pink.....	Fair	Satisfactory; 2 plants
599 F-B	Callistephus	Giant Branching Blue.....	Fair	Satisfactory
599 F-C	Callistephus	Giant Branching White.....	Fair	Satisfactory
599 F-D	Callistephus	Giant Branching Red.....	Fair	Satisfactory
596 F	Delphinium	Larkspur Carmine King.....	Poor	Satisfactory
598 F	Iberis	Candytuft Hyacinth Flowered	Good	Satisfactory
590 F	Petunia	Giant Ruffled Mixed.....	Fair	Satisfactory; 3 colors
595 F	Phlox	Annual Mixed.....	Poor	Satisfactory; 8 colors
593 F	Portulaca	Brilliant Mixed Annual.....	Good	Satisfactory; 12 colors
591 F	Reseda	Mignonette Sweet Machet Mixed.....	Good	Satisfactory; 7 colors
594 F	Salpiglossis	Painted Tongue Mixed.....	Good	Satisfactory; 7 colors
Sterling Seed Co., Minneapolis, Minn.				
H. L. Greene Co., Quincy				
626 F	Callistephus	Crego or Ostrich Feather Mixed	Fair	Satisfactory; 4 colors
629 F	Chrysanthemum	Annual Merry Mixture.....	Fair	Incomplete; only 1 plant flowered
628 F	Dianthus	Double Mixed.....	Good	Satisfactory; 4 colors
627 F	Nemophila	Blue.....	Good	Satisfactory
631 F	Petunia	Hybrida Pink Rose of Heaven	Good	Satisfactory
630 F	Portulaca	Double Mixed.....	Good	Satisfactory; 10 colors; 10% single
Templin Bradley Co., Cleveland, Ohio				
(Children's Flower Mission) Washington School, Taunton				
380 F	Alyssum	Pure White.....	Fair	Satisfactory
381 F	Centaura	Double Mixed Colors.....	Fair	Satisfactory; 4 colors
382 F	Delphinium	Mixed colors.....	None	
384 F	Portulaca	Mixed Colors.....	Fair	Satisfactory; 10 colors
383 F	Reseda	Mixed Varieties Mignonette..	Fair	Satisfactory
385 F	Sanvitalia	Double Yellow Creeping Zinnia	Fair	Satisfactory
Thornton & Crouch, Lawrence Mass.				
408 F	Chrysanthemum	Single Mixed.....	Fair	Satisfactory; 3 colors
407 F	Impatiens	Camellia Flowered Balsam....	Poor	Not satisfactory; 2/3 single flowered
406 F	Zinnia	Dahlia Flowering Mixed.....	Good	Satisfactory; 8 colors
Vaughan's Seed Store, New York, N. Y.				
Carlisle Hardware Co., Springfield				
818 F	Alyssum	Little Gem.....	Poor	Satisfactory
820 F	Convolvulus Minor	Dwarf Mixed.....	Good	Satisfactory
816 F	Tagetes	Dahlia Flowered Sunset Giants	Good	Satisfactory; 6 types
822 F	Zinnia	Giant Dahlia Flowered Crim- son Monarch.....	Good	Satisfactory
821 F	Zinnia	Lilliput Tom Thumb Mixture..	Good	Satisfactory; 7 colors
819 F	Zinnia	Pumila Double Sunshine Tints	Good	Satisfactory; 13 colors
817 F	Zinnia	Vaughan's Midget Mixture...	Fair	Satisfactory; Mexicana type; 12 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
S. D. Woodruff & Sons, Orange, Conn.				
Easthampton Hardware Co., Easthampton				
779 F	Ageratum	Blue Perfection.....	Fair	Too few plants for a performance test
769 F	Calendula	Double Flowering Finest Mixed colors.....	Good	Satisfactory; 6 colors
780 F	Callistephus	Branching All Colors.....	Poor	Satisfactory; 2 colors
778 F	Celosia	Crested Dwarf Mixed Colors...	Good	Satisfactory; 4 colors
770 F	Delphinium	Finest Mixed Larkspur.....	Poor	Satisfactory; 4 colors
772 F	Eschscholtzia	Cal. Poppy Finest Mixed Colors	Good	Not satisfactory; only 2 colors
775 F	Gypsophila	Baby's Breath.....	Good	Satisfactory
771 F	Impatiens	Camellia Flowered Finest Mixed.....	Poor	Not satisfactory; 90% single
773 F	Ipomoea	Heavenly Blue.....	Good	Satisfactory
777 F	Salvia	Scarlet Sage Bonfire.....	Fair	Satisfactory
774 F	Tagetes	Yellow Supreme Carnation Flowered.....	Poor	Satisfactory
776 F	Verbena	Choice Mixed.....	Poor	Satisfactory; 4 colors

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 144

MAY 1950

**Inspection of Commercial
Feedstuffs**

By FEED CONTROL SERVICE STAFF

This is the fifty-sixth report on feeding stuffs inspection. Included are data on the vitamin D content of fish liver oils, the carotene content of alfalfa meals, and the quality of ground oats and Canadian refuse screenings, as well as other information of interest to those concerned with the production, distribution or use of feeds.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Assistant Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
Edward S. Berestka, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

Several problems of particular interest and concern to the Massachusetts Feed Control Service were attacked during the past inspection season. Enough progress has been made to insure the early solution of at least some of the problems in a reasonably satisfactory manner.

In late 1949 a considerable tonnage of Canadian Refuse Screenings was shipped into Massachusetts. It was found that this product contained a relatively high percentage of ground weed seeds considered injurious to livestock as well as large numbers of viable noxious weed seeds. A warning letter to all Massachusetts feed manufacturers, importers and dealers stopped further importations.

It is planned to have the Massachusetts Feed Law amended to include specific provisions regulating the viable weed seed content of feeds. This is necessary not only to prevent the importation of undesirable feeds from Canada but also to eliminate the sale of domestic feed ingredients and mixed feeds containing viable noxious weed seeds.

Further attention was given the quality of ground oats shipped into the State. It is believed that the drastic measures taken against the principal offending shipper have remedied the generally unsatisfactory situation found in the fall of 1949. Oat products will continue to receive special attention.

Microscopic examination of mixed feeds indicates that the ingredients present in the mixtures of some manufacturers differ considerably from those listed on the tags. In the future these manufacturers will be required to list the ingredients correctly on their tags.

Encouraging results have been obtained in the determination of vitamin A in mixed feeds. It will be possible now to check on the vitamin A potency of vitamin feed supplements and mixed feeds as well as that of feeding oils.

It is felt that progress has been made toward the better evaluation of the quality of feeds being sold in Massachusetts. It is intended to further such work during the next inspection season.

Brands Substantially Complying with Guarantees

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Acme-Evans Co., Inc.		Buckeye Cotton Oil Co.	
Acme Hominy.....	1	Buckeye 44% Protein Solvent Ex- tracted Soybean Oil Meal.....	2
Acme Wheat Bran.....	1	Clinton Industries, Inc.	
Acme Wheat Standard Middlings with screenings.....	1	Clinton Corn Gluten Feed.....	1
Allied Mills, Inc.		Consolidated Rendering Co.	
June Pasture.....	1	Corenco Bone Meal.....	1
Sugarine 16% Dairy Ration.....	6	Corenco 50% Meat & Bone Scrap... Corenco 47% Meat & Bone Scrap... *Corenco 45% Meat & Bone Scrap... Corn Products Sales Co. Buffalo Brand Corn Gluten Feed... Diamond Brand Corn Gluten Meal..	2 1 3 2 1
Wayne All Mash Egg.....	1	Courcy & Sons Grain Co.	
Wayne All Mash Grower.....	2	Courcy's Dairy Feed.....	1
Wayne Breeder Mash.....	1	Courcy's Growing Mash.....	1
Wayne Chick Starter.....	1	Courcy's Horse Feed.....	1
Wayne 20% Dairy Ration.....	2	Courcy's Laying Mash.....	1
Wayne 16% Dairy Ration.....	2	Cover Grain & Feed Co.	
Wayne Egg Mash.....	2	C & P Grade A Laying Mash.....	1
Wayne Fitting Ration.....	1	C & P Growing Mash.....	1
Wayne Flushing Mash.....	1	C & P Pig & Hog Feed.....	1
Wayne Growing Mash.....	1	C & P Starter & Broiler Ration....	1
Wayne Mash Layer.....	1	Chas M. Cox Co.	
Wayne 16% Milk Producer.....	1	Wirthmore Breeder Mash.....	1
Wayne Pork Maker.....	1	Wirthmore Complete Breeder Ration..	1
Wayne Rabbit Ration.....	1	Wirthmore Complete Egg Ration.....	1
Wayne Turkey Growing Mash.....	1	Wirthmore Complete Growing Ration	1
Wayne Turkey Starting Mash.....	1	Wirthmore 20 Dairy Ration.....	2
Archer-Daniels-Midland Co.		Wirthmore 16 Dairy Ration.....	2
Archer Quality 32% Protein Expeller		Wirthmore 14 Fitting Ration.....	2
Linseed Oil Meal.....	1	Wirthmore Growing Mash.....	1
Edward R. Bacon Grain Co.		Wirthmore Hi-Ener-G Starter and Broiler.....	1
Puttershoek Beet Pulp.....	1	Wirthmore Mink Food.....	1
E. W. Bailey & Co.		Wirthmore Pig and Hog Feed.....	1
Pennant Brand Pig Feed.....	1	Wirthmore 20 Record Ration.....	1
Barber & Bennett, Inc.		Wirthmore 16 Record Ration.....	2
Ace Dairy Ration.....	1	Wirthmore Sheep & Goat Ration....	1
Fort Orange Broiler Mash.....	1	Wirthmore Starter & Broiler Ration..	1
Fort Orange 12% Fitting and Calf Grain Ration.....	1	Wirthmore Turkey Fattening Ration..	1
Fort Orange Golden Test Ration....	1	Wirthmore Turkey Growing Ration..	1
Fort Orange Laying Mash.....	1	Wirthmore Turkey Starter.....	1
Fort Orange Pig & Hog Feed.....	1	Crawford Brothers, Inc.	
15% Pasture Ration.....	1	Crawford Complete Egg Mash.....	1
Beacon Milling Co., Inc.		Crawford Complete Growing-Mash... Crawford Fattening-Finishing Pellets Crawford Fitting Ration 14% Crawford Growing Mash..... Crawford Horse Feed..... *Crawford Laying Mash..... Crawford Producer 20% Crawford Special Test 16% Curley Grain & Fuel Co. Crystal 20% Breeder Mash..... Crystal 15% Complete Growing Mash Crystal 16% Complete Laying Mash Crystal 20% Dairy Feed..... Crystal 18% Growing Mash..... Crystal 20% Laying Mash..... Crystal 20% Starter-Broiler Mash..	1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 2 1 2
Beacon "16".....	1	Dailey Mills, Inc.	
Beacon Battery Layer.....	1	Double Diamond Body Builder.....	1
Beacon Dairy Fitting.....	1	Double Diamond Complete Egg Producer.....	2
Beacon "22" Egg Mash.....	1	Double Diamond Complete Layer....	1
Beacon Fleshing Pellets.....	1		
Beacon Hog Feed.....	1		
Beacon Test Cow Ration.....	1		
Beacon Turkey and Game Bird Breeder	1		
Blatchley & Ballard, Inc.			
Bee Brand 17% Complete Growing Mash.....	1		
Bee Brand 16% Dairy Ration.....	1		
Bee Brand Laying Mash.....	1		
Borden Grain Co.			
Borden's Dairy Feed.....	1		
Borden's Growing Feed.....	1		
Borden's Laying Mash.....	1		
Borden's Super Starter Feed.....	1		
Borden's Sweet 16 Dairy.....	1		
George B. Brown Corp.			
Brown's Dairy Feed.....	2		
Brown's Egg Mash.....	2		
Brown's Growing Mash.....	2		
Brown's Pig Feed.....	2		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Dailey Mills, Inc.—Concluded		Elmore Milling Co., Inc.—Concluded	
Double Diamond Hical Layer.....	1	Elmore Complete Rabbit Ration....	1
Double Diamond 20% Milk Producer	1	Elmore Dry and Freshening Ration..	1
*Double Diamond 16% Milk Producer	2	Elmore Fitting Ration.....	1
Double Diamond Rabbit Pellets....	1	Elmore Fullflo 20% Dairy.....	1
Double Diamond Sweet Bulky.....	1	Elmore Grand Champion Ration....	1
Double Diamond Turkey Grower....	2	Elmore Growing Mash.....	1
		Elmore Milk Grains "Sixteen".....	1
Delaware Mills, Inc.		Elmore Poultry Fitting Ration.....	1
Delaware Laying Mash.....	1	Elmore Test Ration.....	2
Delaware Pig and Hog Feed.....	1	Elmore Turkey Finisher (Fattener)..	1
Delaware Sweet 16% Dairy Feed....	1	Elmore Turkey Fitting Ration.....	1
		Elmore Turkey Growing Mash.....	2
F. Diehl & Son, Inc.		John W. Eshelman & Sons	
Diehl's Dry Mash.....	1	Conestoga 20% Dairy Feed.....	1
Diehl's Fitting Ration.....	2	Pennsy 16% Dairy Feed.....	1
Diehl's Growing Feed.....	2	Red Rose Broiler Ration.....	1
Diehl's Starter Mash.....	1	Red Rose 18% Dairy Feed.....	1
Dietrich & Gambrill, Inc.		Red Rose 16% Dairy Feed.....	1
D & G Breeder Mash.....	1	Red Rose Fattening Mash.....	1
D & G Broiler Mash.....	1	Red Rose Fitting Ration.....	1
D & G Fleshing Mash.....	1	Red Rose Hi-Lo Broiler Ration....	1
D & G Growing & Fitting Ration..	1	Red Rose Horse Feed.....	1
D & G Special Broiler Mash.....	1	Red Rose Laying Mash.....	1
D & G Turkey Growing Mash.....	1	Red Rose Pig & Hog Meal.....	1
Frederick 16% Dairy.....	2	Red Rose Steer Feed.....	1
Frederick Laying Mash.....	1	Red Rose Turkey Grower.....	1
Gambrill's Growing Mash.....	1	SOS.....	1
Gambrill's Laying Mash.....	1		
Pen Mar 20% Dairy.....	1	Essex County Co-operative Farming Association	
Dodge Grain Co.		S-X All Mash Breeder.....	1
Dodge Starting Growing Mash.....	2	S-X All Mash Egg.....	1
Dover Milling Co.		S-X All Mash Growing.....	1
Pure Wheat Bran.....	1	S-X Breeder Mash.....	1
Wheat Standard Middlings and Mill Run Screenings.....	1	S-X 18% Dairy Ration.....	1
		S-X Egg Mash.....	1
J. L. Dunnell & Son		S-X 14% Fitting Ration.....	1
Excel 18% Dairy Ration.....	2	S-X Growing Mash.....	1
Excel Fitting Ration.....	2	S-X Starter and Broiler.....	1
Excel Laying Mash.....	2	S-X Starter and Broiler—Connecticut Formula.....	1
Horse Feed.....	2		
Starter and Grower—Horner's.....	2	Farm Bureau Association	
East Longmeadow Grain Store		Breeder Mash.....	1
Blue Ribbon All Mash Grower.....	1	Chick Starter Mash.....	1
Blue Ribbon All Mash Layer.....	2	Complete Breeder Mash.....	1
Blue Ribbon Chick Starter & Broiler Mash.....	1	Complete Developer Mash.....	1
Blue Ribbon 16% Dairy.....	2	Complete Market Egg Mash.....	1
Blue Ribbon Dry & Freshening Feed	2	16% Dairy Ration.....	2
Blue Ribbon Lay Mash.....	2	Developer Mash.....	2
Blue Ribbon Pig & Hog Feed.....	1		
Eastern States Farmers' Exchange, Inc.		Ferncau Grain Co.	
Eastern States Calving Ration.....	1	F Corn Distillers Dried Grains.....	1
Eastern States Fulpail.....	1		
Eastern States Highland 16.....	1	Flory Milling Co., Inc.	
Eastern States Horse Feed.....	1	Flory Blue Mountain Horse Feed...	1
Eastern States Milkmore.....	1	Flory Fattener and Flesher Pellets..	1
Eastern States Pig Starter & Breeder	1	Flory 18% Grower Mash.....	1
Eastern States Pork Builder.....	1	Flory Layer Mash.....	1
		Flory Record 16% Dairy Feed.....	1
B. A. Eckhart Milling Co.		Flory Starter Mash.....	1
Ecko Pure Wheat Bran.....	1	Flory Superior 16% Dairy Feed.....	1
		Flory Superior Dry Calf Starter....	1
Elmore Milling Co., Inc.		Flory Superior 14% Fitting Ration..	1
Elmore Breeder Mash.....	1	Flory Turkey Grower Pellets.....	1
Elmore Calf Grain Ration.....	1	Golden Egg Layer Mash.....	1
Elmore Chixsaver.....	1		
Elmore Complete Growing Ration..	2	Fred A. Fountain	
Elmore Complete Market Egg Mash	2	Fountain's Breeder Mash.....	1
		Fountain's Growing Mash.....	1
		Fountain's Laying Mash.....	1
		Fountain's Starting & Broiler Mash..	1

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Gateway Milling Association, Inc.		Hood Mills Co.	
Gateway All Mash Grower.....	1	* Pulverized Hood.....	3
Gateway All Mash Layer.....	1	E. C. & W. L. Hopkins, Inc.	
Gateway 20% Dairy Feed.....	1	Granite State Growing Mash.....	1
Gateway 16% Dairy Feed.....	1	International Milling Co.	
Gateway Star 16% Dairy Feed.....	1	Blackhawk Wheat Standard Middlings with Ground Wheat Screenings not exceeding mill run.....	2
General Mills, Inc.		Henkel's Wheat Red Dog.....	1
Ben Hur Wheat Standard Middlings and Ground Wheat Screenings not exceeding mill run.....	1	Jaquith & Co.	
Washburn's Gold Medal Hard Wheat Bran and Ground Wheat Screenings not exceeding mill run.....	1	Jaquith Growing Mash.....	1
General Mills, Inc., Farm Service Division		Jaquith Laying Mash.....	1
Farm Service 20% Dairy Ration....	1	Jaquith Starting Mash.....	1
Farm Service 18% Grower Mash....	1	Kansas Flour Mills Co. (Trade Name) of Flour Mills of America, Inc.	
Farm Service 18% Layer Mash.....	1	Big Flake Pure Wheat Bran.....	1
Vigor 18% Layer Mash.....	1	Spencer Kellogg & Sons, Inc.	
General Mills, Inc., Larrowe Division		Spencer Kellogg's 41% Soybean Oil Meal—Expeller.....	2
Dried Beet Pulp.....	2	H C. Knoke & Co.	
Larro Broiler Feed.....	1	Barley Feed.....	1
Larro Chick Builder.....	1	Kronick's Coal & Grain Co.	
Larro 20% Dairy Feed.....	1	Kronick's Dairy Ration 16%.....	1
Larro 16% Dairy Feed.....	1	Kronick's Egg Mash.....	1
Larro Egg Mash.....	1	Kronick's Starter-Grower Mash....	1
Larro Green Pellets for Rabbits....	1	Kuder Citrus Pulp Co.	
Larro Poultry Breeder Mash.....	1	Kuder Dried Citrus Pulp.....	1
Larro Turkey Builder (Pelleted)....	1	Larabee Flour Mills Co.	
Larro Turkey Finisher.....	1	Sunfed Winter Wheat Bran with Ground Wheat Screenings not to exceed mill run or 8%.....	1
Glidden Co., Feed Mill Division		Lawrence Milling Co., Inc.	
Glidden Breeder Mash.....	2	Hominy Feed.....	1
Glidden Broiler Ration.....	1	Mackenzie & Winslow, Inc.	
Glidden Chick Starter.....	1	Money's Worth Complete Growing..	1
Glidden Growing Mash.....	1	Money's Worth Complete Mash.....	1
Glidden Laying Mash.....	1	Money's Worth Dairy Feed 16%....	2
Glidden Super Broiler Ration.....	1	Money's Worth Growing Mash.....	1
Glidden Co., Soya Products Division		*Money's Worth Laying Mash.....	1
Glidden Quality 44% Protein Solvent Extracted Soybean Oil Meal....	1	Money's Worth Rabbit Pellets.....	1
D. H. Grandin Milling Co.		Money's Worth Starter.....	1
Grandin's All-Mash Breeder.....	1	Maritime Milling Co., Inc.	
Grandin's All-Mash Grower.....	2	B-B Complete Growing Ration....	1
Grandin's All-Mash Layer.....	2	Bull Brand "16" Dairy Ration.....	2
Grandin's Complete Chick Starter..	1	Bull Brand Dry and Fresh Cow Fit- ting Ration.....	1
Grandin's Horse Feed.....	1	Bull Brand 18% Special Dairy Ration	1
Grandin's 20 Milk Maker.....	1	B-B Ma-Co High Energy Breeder Mash	1
Grandin's Start-To-Finish Mash....	2	B-B Ma-Co High Energy Broiler Ration	1
Grandin's 18 Test Ration.....	1	B-B Ma-Co High Energy Complete Growing Ration.....	1
Grandin's 16 Test Ration.....	1	B-B Ma-Co High Energy Complete Laying Ration.....	1
Great Atlantic & Pacific Tea Co.		B-B Ma-Co High Energy Complete Turkey Growing Ration.....	1
Daily-Egg Laying Mash.....	1	Hi-Test Hog Feed.....	1
D. Harbeck & Sons		Methuen Grain Co.	
Welcome Dairy Feed.....	1	Empire All-Mash Grower.....	3
Welcome Egg Mash.....	1	Empire All-Mash Layer & Breeder..	2
Welcome Growing Mash.....	1	Empire Starter-Broiler.....	3
Welcome Starter and Broiler Mash..	1	Harper Feed Mills, Inc.	
Harper Feed Mills, Inc.		Exchange Laying Mash.....	1
Harco Complete Starting and Grow- ing Ration.....	1	Harco Complete Starting and Grow- ing Ration.....	1
Harco 20% Dairy Ration.....	1	Harco 20% Dairy Ration.....	1
Harco Laying Mash.....	1	Harco Laying Mash.....	1
Harco Range Growing Mash.....	1	Harco Range Growing Mash.....	1
Harco Stock Feed.....	1	Harco Stock Feed.....	1
Harco Turkey Finisher Mash.....	1	Harco Turkey Finisher Mash.....	1
Puritan Growing Mash.....	1	Puritan Growing Mash.....	1

*See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Miner-Hillard Milling Co.		Parrish & Heimbecker, Ltd.	
Choice Steam Cooked Hominy Feed	1	Parrheim Pure Wheat Shorts	1
Geo. Q. Moon & Co., Inc.		Pasco Packing Co.	
Bulky Cow Feed	1	Sugar Sweet Citrus Pulp	1
Moon's 24% Dairy Ration	1	Patent Cereals Co.	
Moon's Fitting Ration	2	Hominy Feed	1
Moon's Growing Mash	1	Perkins Oil Co.	
Moon's Hog Feed	1	Golden Rod Brand Cottonseed Meal	1
Moon's 90 Horse Feed	2	Pilgrim Feed Co.	
Moon's Laying Mash	1	A-Z Pilgrim Grower	1
Moon's Stock Feed	1	Pilgrim 18% Milkproducer	1
Moon's Super Broiler Ration	1	Pilgrim Pullet Builder	1
*Moon's 32% Supplement Ration	1	Pillsbury Mills, Inc.	
Moon's 16% Test Ration	2	Pillsbury's Hard Wheat Bran	2
N. E. Complete Laying Mash	2	Pittsford Flour Mills, Inc.	
Special A 20% Dairy Ration	2	Hard Wheat Bran	1
Special A 18% Dairy Ration	2	Hard Wheat Middlings	1
Special A 16% Dairy Ration	2	Quaker Oats Co.	
Turkey Grower Mash	1	Ful-O-Pep All Mash	1
U. S. 20% Dairy Ration	1	Ful-O-Pep Broiler Mash	1
Jas. F. Morse & Co.		Ful-O-Pep Egg-Breeder Mash	1
Morse's 50% Meat & Bone Scraps	1	Ful-O-Pep Fitting Ration	1
Morse's 45% Meat & Bone Scraps	1	Ful-O-Pep Goat Feed	1
National Biscuit Co.		Ful-O-Pep Growing Mash	1
Pure Wheat Bran	1	Ful-O-Pep Laying Mash	1
Ogden Grain Co.		Ful O-Pep Rabbit Pellets	1
Ogden "Biddy" Mash	1	Ful-O-Pep Super Greens	1
Ogden Complete Pellets	1	Peterborough Oat Feed	2
Ogden Complete Starter-Grower-Layer-Breeder	1	Quaker 20% Protein Dairy Ration	1
Ogden 16% Dairy Feed	1	Quaker 16% Protein Dairy Ration	1
Ogden Fitting Ration	1	Quaker Schumacher Feed	1
Ogden Layer & Breeder	1	Quaker Sugared Schumacher Feed	1
Ogden Pig Feed	1	Vim Oat Mill Feed	2
Oswego Soy Products Corp.		Ralston Purina Co.	
Soy Bean Oil Meal Toasted	1	Northeastern Special Dairy 18%	1
Palm Grain Co.		Purina B & M Cow Chow	1
Palm's Complete Mash	1	Purina Broiler Checkers Supplement	2
Park & Pollard Co., Inc.		Purina Broiler Chow	2
Doublex 20% Dairy Ration	1	Purina Chick Growena	1
Lay or Bust All Mash Breeder	1	Purina Chick Startena	2
Lay or Bust All Mash Grower	2	Purina Cow Chow	2
Lay or Bust All Mash Layer	3	Purina Dry and Freshening Chow	1
Lay or Bust Breeder Mash	1	Purina Eastern Cow Chow	1
Lay or Bust Broiler Mash	1	Purina Flock Chow	1
Lay or Bust Chick Starter	1	Purina Goat Chow	1
Lay or Bust Egg Mash	1	Purina Hog Fatena	1
Lay or Bust Fleshing Pellets	1	Purina Layena (Complete Ration)	1
Lay or Bust Growing Feed	2	Purina Omolene	1
Lay or Bust Laying Pellets	1	Purina Turkey Fatena (Complete Finisher Ration)	2
Lay or Bust Hi-Valu Scratch Pellets	1	Purina Turkey Growena	2
Lay or Bust Turkey Grower	1	Purina Turkey Startena	1
Milk Maid Bulky Sweet Dairy	1	John Reardon & Sons Division of Wilson & Co., Inc.	
Milk Maid 20% Dairy Ration	1	Register Brand 50% Protein Meat and Bone Scrap	1
Milk Maid Fitting Ration	2	Register Brand 45% Protein Meat and Bone Scrap	2
Special Milk-Maid 20% Ration	1	Register Brand Fish Meal	1
Special Milk Maid 16% Dairy	2	D. F. Riley	
Milk Maid Test Cow Ration	1	Riley's 16% Dairy Ration	2
Park & Pollard Go-Tu-It Pig & Hog Ration	2	Riley's 18% Growing Mash	1
Yankee Horse Feed	1	Riley's 18% Laying Mash	2
George H. Parker Grain Co.			
*Bill McHugh's Thoroughbred Horse Feed	1		
Parker's Egg Mash	2		
Parker's Growing Mash	2		
Parker's Special Starter & Broiler Mash	2		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Concluded

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Rodney Milling Co.		Ventura Grain Co.	
Heart of America Pure Wheat Bran.	1	*Every-Day Dairy	1
Russell-Miller Milling Co.		Every-Day 20% Dairy	2
Hard Wheat Occident Bran	3	Every-Day 16% Dairy	1
Hard Wheat Occident Standard Middlings containing Ground Wheat Screenings not exceeding mill run	1	Every-Day 14% Dairy & Fitting	1
Hard Wheat Occident Mixed Feed containing Ground Wheat Screenings not exceeding mill run	1	Every-Day Starter & Broiler	2
		Ventura Grower	2
		Ventura Laying Mash	2
Ryther & Warren Co.		O. E. Vunck & Son	
Blue Tag Dairy Ration	3	Cortland Laying Mash	1
Minot Egg Mash	2	Cortland Supreme Ration	1
Minot Growing Mash	2	C. P. Washburn Co.	
Allen V. Smith, Inc.		Made-Right Breeder Mash	1
Smith's Barley Feed Red Tag Brand	1	Made-Right Complete Broiler Ration	1
A. E. Staley Manufacturing Co.		Made-Right Fitting Ration	1
Staley's Corn Gluten Feed	2	Made-Right Growing Feed	1
Staley's 41% Protein Expeller Soybean Oil Meal	3	Made-Right Horse Feed	1
Staley Milling Co.		Made-Right Laying Mash	1
Hy-Power Hominy Feed	1	H. K. Webster Co.	
Stratton & Co., Inc.		Blue Seal All-Mash Breeder's Ration	2
Wheat Mixed Feed, Wheat Screenings (not exceeding mill run)	1	Blue Seal All-Mash Egg Ration	2
S & Co.'s Stock Feed	2	Blue Seal All-Mash Growing Ration	3
Swift & Co., Soybean Mills		Blue Seal Breeder's Mash	2
Swift's 44% Protein Soybean Oil Meal (Solvent)	1	Blue Seal Calf Grower	2
Swift's 42% Protein Soybean Oil Meal (Expeller)	1	Blue Seal Calf Starter	1
Taunton Grain Co.		Blue Seal Chick Starter	1
Balanced Ration	1	Blue Seal "20" Dairy Ration Coarse	1
Fitting Ration	1	Blue Seal Fine "20" Dairy Ration	1
Growing Mash	1	Blue Seal "16" Dairy Ration Coarse	1
Laying Mash	1	Blue Seal Fine "16" Dairy Ration	2
Winnecunnet Turkey Growing	1	Blue Seal Egg Mash	1
Tioga Mills, Inc.		Blue Seal Fattening Pellets	2
Ti-O-Ga Broiler Feed	1	Blue Seal Goat Feed	1
Unity Feeds, Inc.		Blue Seal Growing Mash	2
Unity 20% Dairy Ration	1	Blue Seal Horse Feed	1
Unity 16% Dairy Ration	1	Blue Seal Pig Feed	2
Unity Fitting Ration	1	Blue Seal Stock Feed	1
Unity Super-Gro Ration	1	Blue Seal Super Mash	2
Universal Grain Co. of N. J.		Blue Seal Super Starter & Broiler	3
Superior Cow Brand Dried Brewers Grains	1	Blue Seal Turkey Growing	2
Valier & Spies Milling Co. (Trade Name) of Flour Mills of America, Inc.		Stanley Wood Grain Co.	
Valier's Wheat Bran	2	Bliss Dairy Ration	1
Van Iderstine Co.		Preferred Complete Growing Ration	1
Vico Steamed Bone Meal	1	Preferred Complete Laying Ration	1
		Preferred Growing Feed	1
		Preferred Laying Mash	1
		Preferred Starter & Broiler Ration	1
		Preferred Turkey Starter & Grower	1
		Wood's 16% Dairy Feed	2
		Wood's Stock Feed	1
		Yieldmor Feeds, Inc.	
		Central Sweet 20% Dairy Feed	1
		Central Sweet 16% Dairy Feed	1
		Central 20% Egg Mash	1
		Yieldmor Broiler Feed	1
		Yieldmor Chick Starter	1
		Yieldmor 20% Egg Mash (Pellets)	1
		Yieldmor Growing Mash	1
		Yieldmor 14 Hog Fat	1
		Yieldmor Poultry Fitting Ration	1
		Yieldmor 16% Sweet Dairy	1
		Yieldmor Sweet Feed	1
		Yieldmor Turkey Grower	1

* See also table of "Brands Not Conforming to Guarantees."

Brands Not Conforming to Guarantees

This table includes brands that are one percent or more under guarantee in protein or fat or are one and one-half percent or more over guarantee in fiber.

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Consolidated Rendering Co.							
* Coreenco 45% Meat & Bone Scrap.....	43.2	45.0	10.1	6.0	—	—	48.2
Crawford Brothers, Inc.							
**Sulfaquinoxaline mixed in Hi-Energy Starter & Broiler Mash.....	21.3	21.0	3.5	4.0	4.8	3.0	5.7
*Crawford Laying Mash.....	18.6	20.0	3.6	3.5	5.6	8.0	5.6
Crawford Rabbit Pellets.....	18.7	16.0	3.9	3.0	12.4	9.0	6.7
Crawford Starting Mash.....	23.5	26.0	2.6	4.0	6.8	8.0	10.1
Dailey Mills, Inc.							
*Double Diamond 16% Milk Producer..	18.0	16.0	2.8	4.0	8.3	10.0	10.2
F. Diehl & Son, Inc.							
Diehl's Dairy Feed.....	16.6	18.0	2.7	3.0	7.6	12.0	7.0
Elmore Milling Co., Inc.							
Elmore Stock Feed.....	12.3	10.0	3.1	3.0	13.5	12.0	5.7
Elmore Super Silage.....	10.9	11.0	2.6	2.0	19.7	18.0	7.2
General Mills, Inc., Farm Service Div.							
Farm Service Stock Feed.....	10.7	8.5	3.8	3.5	14.5	12.0	6.0
Harper Feed Mills, Inc.							
Puritan Dairy Fitting Ration.....	15.9	14.0	1.6	3.0	8.6	11.5	6.5
Hood Mills Co.							
*Pulverized Hood.....	11.8	11.0	2.1	2.0	14.6	13.0	4.0
Jaquith & Co.							
Jaquith 20% Dairy Ration.....	18.5	20.0	3.8	3.5	6.9	10.0	8.8
Mackenzie & Winslow, Inc.							
Money's Worth Dairy Feed 20%.....	20.9	20.0	4.0	4.0	11.4	9.5	6.5
*Money's Worth Laying Mash.....	16.5	18.0	3.6	4.5	6.9	7.0	7.5
Geo. Q. Moon & Co., Inc.							
*Moon's 32% Supplement Ration.....	28.5	32.0	3.1	3.0	7.1	10.0	9.4
George H. Parker Grain Co.							
*Bill McHugh's Thoroughbred Horse Feed.....	13.2	15.0	4.5	4.0	7.4	10.0	4.6
Stratton & Co.							
Stratton Fancy Wheat Bran.....	13.0	14.0	3.5	4.0	11.2	11.0	6.6
Ventura Grain Co.							
*Every-Day Dairy.....	21.1	22.0	2.6	4.5	7.1	8.0	8.3
C. P. Washburn Co.							
Made-Right Complete Layer.....	16.8	16.0	4.3	4.0	7.6	6.0	6.0
Made-Right 20% Dairy Feed.....	19.0	20.0	5.8	4.0	8.4	8.0	7.4
Made-Right Pig Feed.....	18.1	16.0	3.7	3.0	9.1	7.0	7.0
***Sulfaquinoxaline Mixture incorporated in Made-Right Starting Feed....	18.8	20.0	3.9	3.0	8.0	7.0	7.3
Made-Right Stock Feed.....	10.8	8.0	4.5	3.5	13.3	10.0	4.3

* See also table of "Brands Substantially Complying with Guarantees."

** Sulfaquinoxaline found 0.0102%, guaranteed 0.0125%.

*** Sulfaquinoxaline found 0.013%, guaranteed 0.0125%.

Brands Containing Sulfaquinoxaline

These brands substantially complied with guarantees of protein, fat and fiber, except as noted.

Manufacturer and Brand	Sulfaquinoxaline	
	Found	Guaranteed
Beacon Milling Co., Inc. Sulfaquinoxaline mixed with Beacon Complete Starter.....	0.0132	0.0125
Chas. M. Cox Co. Sulfaquinoxaline Mixture with Wirthmore Complete Growing Ration.....	0.0125	0.0125
Sulfaquinoxaline Mixture with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0115	0.0125
Sulfaquinoxaline Mixture with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0120	0.0125
Sulfaquinoxaline Mixture with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0111	0.0125
Sulfaquinoxaline Mixture with Wirthmore Hi-Ener-G Starter and Broiler Pellets.....	0.0110	0.0125
Sulfaquinoxaline Mixture with Wirthmore Starter and Broiler Ration.....	0.0125	0.0125
Crawford Brothers, Inc. * Sulfaquinoxaline mixed in Hi-Energy Starter & Broiler Mash.....	0.0102	0.0125
Dietrich & Gambrell, Inc. Sulfaquinoxaline Mixture in D & G Broiler Mash.....	0.0130	0.0125
Elmore Milling Co., Inc. Sulfaquinoxaline Mixture in Elmore Turkey Starting Mash.....	0.0210	0.0175
Farm Bureau Association Sulfaquinoxaline Mixture with High Energy Broiler & Starter Mash.....	0.0116	0.0125
General Mills, Inc., Larowe Division Sulfaquinoxaline Mixture in Larro Broiler Feed.....	0.0132	0.0125
D. H. Grandin Milling Co. Sulfaquinoxaline in Grandin's Super Starter & Broiler Ration.....	0.0138	0.0125
Maritime Milling Co., Inc. Sulfaquinoxaline Mixture in B-B Ma-Co High Energy Broiler Ration.....	0.0135	0.0125
Geo. Q. Moon & Co., Inc. Sulfaquinoxaline Mixture in Moon's Super Broiler Ration.....	0.0130	0.0125
Park & Pollard Co., Inc. Sulfaquinoxaline Mixture in Lay or Bust Chick Starter.....	0.0128	0.0125
Sulfaquinoxaline Mixture in Lay or Bust Hi-Power Broiler Ration.....	0.0110	0.0125
Ralston Purina Co. Sulfaquinoxaline Mixture in Purina Broiler Checkers Supplement.....	0.0132	0.0125
Sulfaquinoxaline Mixture in Purina Broiler Chow.....	0.0144	0.0125
Sulfaquinoxaline Mixture in Purina Broiler Chow (Special).....	0.0144	0.0125
Tioga Mills, Inc. Sulfaquinoxaline in Tioga Broiler Feed.....	0.0132	0.0125
Sulfaquinoxaline in Tioga Super Broiler.....	0.0160	0.0125
Sulfaquinoxaline in Tioga Super Broiler.....	0.0125	0.0125
C. P. Washburn Co. * Sulfaquinoxaline Mixture incorporated in Made-Right Starting Feed....	0.0130	0.0125
H. K. Webster Co. Sulfaquinoxaline Mixture in Blue Seal All-Mash Growing Ration.....	0.0145	0.0125
Sulfaquinoxaline Mixture in Blue Seal Super Starter and Broiler.....	0.0144	0.0125
Yieldmor Feeds, Inc. Sulfaquinoxaline Mixture in Yieldmor Hi-Energy Broiler Ration.....	0.0140	0.0125

* See also table of "Brands Not Conforming to Guarantees."

Dry Dog Foods

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Ajax Dog Food Co. Ajax Kibbled Biscuits.....	20.2 ^a	22	2.2	1.5	1.7	3	3.6
Albers Milling Co. Friskies Dog Food.....	26.7	24	5.4	4.5	3.1	4	12.9
Allied Mills, Inc. Wayne Dog Food Blox.....	26.1	25	6.6	6	4.2	5	6.8
Animal Foundation, Inc. Hunt Club Dog Meal.....	{23.6 ^a 27.7	{25 25	{5.3 9.3	{5 5	{2.4 2.5	{4 4	{8.3 10.2
Battle Creek Dog Food Co. Miller's Dog Meal.....	24.3	22	4.2	4	2.6	4	10.4
Miller's Kibbles.....	23.7	22	3.4	3	1.7	3	9.2
Best Dog Food Co. Vita-Best Dog Food Meal.....	21.6 ^a	23.84	3.1	4.06	2.0	3.36	14.4
Vita-Best Dog Food Kibbled Biscuits.....	22.3 ^a	24.31	2.8	2.41	2.6	3.61	11.0
Vita-Best Kibblan-Meal.....	22.6	20.84	5.0	1.90	1.3	4.05	11.0
Borden Co., Special Products Division Borden's Dog Food.....	{28.1 27.2	{25 25	{5.8 6.3	{5.5 5.5	{4.7 3.7	{5 5	{9.8 11.7
Canine Vita Candy Co., Inc. Charge—Candy for Dogs.....	{8.4 7.6	{7 7	{6.8 ^b 9.9	{8 8	{0.5 0.5	{1 1	{7.7 7.2
Champion Animal Food Co. Champion Dog Snax.....	31.4	18	8.3	3.5	1.8	3	13.3
Chas. M. Cox Co. Wirthmore Dog Food.....	27.3	25	9.2	4	3.5	6	12.0
John C. Dow Co. Dow's New Improved Crumpled Meal...	28.2	24	4.8	4	2.3	3.5	13.0
Eastern States Farmers' Exchange, Inc. Eastern States Dog Feed Pellets.....	23.8	24	5.1	4	3.2	4.5	8.7
John W. Eshelman & Sons Red Rose Dog & Puppy Food.....	24.8	23	4.3	4.75	3.2	4	11.6
General Foods Corp., Gaines Division Gaines Meal.....	25.6	25	6.8	6	3.9	5	8.2
Gaines Krunchon.....	25.4	25	6.2	6	3.6	5	9.2
General Mills, Inc., Larowe Division Larow Dog Food.....	26.8	24.5	6.5	4.5	5.6	6	8.9
Great Atlantic & Pacific Tea Co. Daily Dog Food Kibbled Biscuit.....	22.6	22	3.0	3	2.0	3.5	3.4
Daily Dog Pellets.....	24.7	25	4.1	3.5	2.2	4.5	12.6
Hartz Mountain Products Dog Yummies.....	31.1	12.5	6.9	2.4	2.5	5.9	11.1
Kasco Mills, Inc. Kasco Complete Dog Ration.....	28.6	25	10.7	7	3.6	4	9.8
Kasco Complete Dog Ration (Pellets)....	30.0	25	5.0	4	3.7	4	11.3
Kellogg Co. Gro Pup Dog Food.....	27.9	22.5	5.1	3.5	4.0	4	7.5
Gro Pup Ribbon Dog Food.....	{23.9 ^a 26.9	{25 25	{5.1 4.2	{5 5	{3.8 3.3	{4 4	{8.6 7.8
Kennel Food Supply Co., Inc. Ceto Meato Brand Dog Food.....	23.4	21	2.4	2	2.4	3	6.7
Meat Products Co. Blesko Crisp Dog Food.....	25.1	23	4.1	2	3.1	4.5	7.8
National Biscuit Co. Milk-Lone Dog Biscuit.....	23.6	21	2.2	1.5	2.5	2.5	6.3
Pal Dog Biscuit.....	22.0	18.5	2.1	1	2.6	2.5	5.6

^a Deficient in protein.^b Deficient in fat.

Dry Dog Foods—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Old Mother Hubbard Dog Food Co., Inc. Old Mother Hubbard Three Formula Kibbled Dog Biscuits.....	23.9	20	2.0	2	1.8	3	6.5
Old Trusty Dog Food Co. Old Trusty All Terrier Food.....	27.8	25	4.0	2.5	2.2	3	9.4
Quaker Oats Co. Ken-L-Biskit.....	22.6	20	1.5 ^b	4	1.9	3	5.9
Ralston Purina Co. Purina Dog Chow Checkers.....	24.7	21	6.8	4	4.7	6	9.4
Rudhard's Products, Inc. Rudhard's Baked Meat Balls for Dogs...	27.7 ^a	30	9.0	3	0.9	3	22.6
Spratt's Patent (America) Limited Spratt's Assorted Dog Biscuits.....	22.8	20	2.6	2	1.4	7.5	3.0
	21.2	20	3.1	2	1.5	7.5	2.9
	19.5	20	3.6	2	0.9	1.5	3.4
	23.1	22	2.7	2	1.1	1.5	3.0
Sturdy Dog Food Co., Inc. Sturdy Kibbled Ration.....	21.0	19.5	2.2	1.05	1.7	1.5	10.6
Sunshine Biscuits, Inc., Milling Division Austin's Dog Food.....	25.5	22	2.6	2.5	4.1	4.5	6.8
Swift & Co. Swift's Dog Meal.....	28.4	26	10.3	7.5	4.5	6	9.1

^a Deficient in protein.^b Deficient in fat.

Alfalfa Meals

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligrams per Pound
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		
Alfa Green Co., Ltd. Dehydrated Alfalfa Meal 17%	17.0	17	2.3	1.75	26.7	27	9.3	14.8
Birdwood Products								
Dehydrated Alfalfa Meal 17%	{16.5 10.3 17.0	17 17 17	2.8 2.9 3.2	1.75 1.75 1.75	26.2 27.3 26.3	27 27 27	8.9 9.6 9.5	35.8 32.2 37.0
Caro-Green, Inc.								
Caro-Green Dehydrated Alfalfa Meal	{18.7 18.4 20.0 13.8	17 17 17 13	3.3 2.9 3.4 1.6	1.5 1.5 1.5 1.5	22.1 26.5 22.0 33.9	27 27 27 33	9.8 8.8 10.1 8.0	30.7 31.3 59.0 29.1
Central Mills, Inc.								
17% Cento-O-Green Dehydrated Alfalfa Meal	17.8	17	2.8	1.5	23.4	27	11.1	64.5
Cerophyl Laboratories, Inc.								
Dehydrated Alfalfa Meal	18.7	17	2.6	1.5	24.6	27	10.7	14.5
Dawson County Feed Products, Inc.								
Square Fare De-Hy 17% Dehydrated Alfalfa Meal	16.5	17	2.4	1.5	32.60	27	8.6	17.2
Farm Industries, Inc.								
Alfalfa Meal 17%	{18.2 18.0	17 17	3.0 3.5	1.5 1.5	27.2 20.7	30 30	8.2 10.1	36.3 71.2
Grayson Alfalfa Dehydrating Mills								
Dehydrated Alfalfa Leaf Meal	{23.2 23.5	20 20	3.5 4.4	2.5 2.5	20.00 19.0	18 18	11.6 10.6	88.7 78.5
Green Acre Farms								
Green Acre's Brand 17% Dehydrated Alfalfa Meal	18.4	17	2.5	2	26.6	27	9.8	22.5
Johansen Farm Supply								
¼ Cut Alfalfa Meal 13%	15.9	13	1.5	—	33.8	—	8.3	1.6
Keystone Dehydrators								
Keystone Super-Green Dehydrated Alfalfa Meal	17.7	17	2.3	2	29.1	30	8.8	16.1
Keystone Super-Green Dehydrated Alfalfa Meal	{18.5 19.1 17.0	17 17 17	3.1 4.1 3.9	2 2 2	27.6 26.1 22.4	27 27 27	8.1 11.9 9.6	41.7 24.0 47.2
LeRoy Alfalfa Corp.								
Dehydrated Alfalfa Meal	16.4	17	2.9	1.5	27.5	30	7.5	27.8

Feed Supplements

	Protein		Fat		Fiber		Ash	Riboflavin		
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		Found	Milligrams per Pound	
									Found	Guaranteed
Alaska Fish Oil Extractors, Inc.										
Afco Blend.....	52.9	50	4.8	3.0	3.5	4.0	9.8	—	—	
Borden Co., Special Products Division										
Ration-ayd VamPros.....	38.6	35	5.2	1.0	4.5	7.5	8.2	11.4	8	
Commercial Solvents Corp.										
B-Y-21 Dried Grain and Skimmed Milk Fermentation Solubles.....	28.5	28	3.1	2.0	4.7	5.0	13.4	4,155	3,630	
B-43 Riboflavin Supplement.....	(17.1	14	11.0	4.0	6.0	7.0	5.3	245	227	
	16.5	14	5.6	4.0	6.8	7.0	4.9	229.5	227	
Dairymen's League Co-operative Assn., Inc.										
Dairylea Dried Skim Milk.....	33.7	33	1.4	0.5	—	—	8.0	—	—	
Dawe's Manufacturing Co.										
Dawe's Broiler Base.....	48.8	45	9.6	6.0	3.2	5.0	8.9	62.2	—	
Dawe's Flavonne Kibo-D.....	33.2	31	4.7	2.0	4.2	6.0	7.8	—	22.70	
Dawe's Vitamelk Base.....	38.5	34	4.0	3.0	4.9	6.0	7.1	33.5	31.78	
Dawe's Vitamelk Base.....	(38.1	34	4.0	3.0	4.7	6.0	7.8	37.2	31.78	
	38.2	34	5.3	2.0	5.2	6.0	7.2	13.8	9.08	
Dawe's Vitamelk Base Animal Type.....	(37.7	34	3.5	2.0	4.6	6.0	6.7	11.5	9.08	
Gorton-Pew Fisheries Co., Ltd.										
Gorton's All-Fish Blend "Junior" (a).....	40.4	40	8.5	6.0	7.5	8.0	18.9	18.5	18	
Gorton's All-Fish Blend "Junior" (b).....	41.3	40	9.6	6.0	8.0	8.0	21.0	20.0	18	
H. P. Hood & Son, Inc.										
Powdered Skim Milk.....	30.0	28	3.6	0.75	—	—	9.5	—	—	

Oat Products

Under United States Grain Standards for Oats we find this definition: "Oats shall be any grain which consists of 80 percent or more of cultivated oats. Oats may contain not more than 10 percent of wild oats."

The following are the United States Grain Standards grade requirements for oats:

Oats

Grade requirements for the classes White Oats, Red Oats, Gray Oats, Black Oats, and Mixed Oats

Grade No.	Minimum limits of—		Maximum limits of—		
	Test weight per bushel	Sound cultivated oats	Heat-damaged kernels (oats, other grains, and wild oats)	Foreign material	Wild oats
	Pounds	Percent	Percent	Percent	Percent
1 <i>a</i>	32	97	0.1	2	2
2 <i>b</i>	30	94	.3	3	3
3 <i>c</i>	27	90	1.0	4	5
4 <i>d</i>	24	80	3.0	5	10
Sample grade	Sample grade shall include oats of any one of the classes White Oats, Red Oats, Gray Oats, Black Oats, or Mixed Oats, which do not come within the requirements of any of the grades from No. 1 to No. 4, inclusive; or which contain more than 16 percent of moisture; or which contain stones and/or cinders; or which are musty, or sour, or heating, or hot; or which have any commercially objectionable foreign odor except of smut or garlic; or which contain seeds of wild brome grasses of a character and in a quantity sufficient to cause the grain to be of low quality for feeding purposes; or which are otherwise of distinctly low quality.				

a The oats in grade No. 1 White Oats may contain not more than 5 percent of oats of other classes, of which not more than 3 percent may be black cultivated oats.

b The oats in grade No. 2 White Oats may contain not more than 5 percent of black cultivated oats.

c Oats that are slightly weathered shall not be graded higher than No. 3.

d Oats that are badly stained or materially weathered shall not be graded higher than No. 4.

According to the above requirements it is possible to add 20 percent weed seeds or 20 percent oat hulls or 20 percent refuse screenings to clean 24-pound No. 4 oats and call the mixture Sample Grade Oats. Not many farmers would buy these mixtures as whole oats. Yet ground mixtures even worse than these have been and are being sold as "ground oats."

Information from several sources indicates that some Massachusetts feed manufacturers demand a cheap grade of "ground oats." These manufacturers know that at the price they are paying the product received labelled "ground oats" cannot be as labelled. The Feed Control Service has been unable to find anyone possessing the secret of selling at a profit ground oats at a lower price than that of whole oats of exactly the same quality.

Hereafter, any ground oat product containing more than 5 percent foreign material, in the aggregate, will be considered a mixture and the listing of ingredients will be required. As an example, ground sample grade oats containing 6 percent weed seeds, 10 percent excess oat hulls and 4 percent dirt shall be labelled "Ground Sample Grade Oats. Ingredients: ground oats, ground oat hulls, ground weed seeds and dirt."

Screenings and refuse screenings are considered as mixtures also. A ground mixture of oats and barley screenings, for example, shall be labelled "Ground Oats and Ground Barley Screenings. Ingredients: ground oats, ground inferior barley, ground hulls, chaff and dirt."

If mixtures such as the examples given above are used in a mixed feed, the ingredients as listed above shall be included in the list of ingredients for the mixed feed.

The Feed Control Service recognizes the fact that various products like good grades of oat, barley and wheat screenings have a place in the feed industry. Even the inferior grades of these products may be utilized advantageously as feeds. However, these materials must be bought and sold on the basis of their own merits and under labels that are not misleading.

In the table are listed the results of our examination of samples of oat products. Most of these products were found to be mislabelled.

The greatest offender was the LaCrosse Milling Company, of Cochrane, Wisconsin. Several Federal samples were taken from shipments by this concern. The analytical and shipping data were submitted to the Federal Food and Drug Administration. One lot was seized. Originally labelled "ground oats," this product was relabelled "Mixed Feed. Ingredients: ground oats, ground wheat, ground barley, oat mill feed and not more than 10% screenings."

A Federal sample was taken also from a shipment of ground mixed feed oats from Jas. Richardson & Sons, Ltd., Toronto, Canada.

Oat Products

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Whole Weed Seeds per Pound	Results of Microscopic Examination
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed				
Allied Mills, Inc. Ground Oats.....	12.3	10	4.4	3.75	12.8	12	5.3	2.9	2.690	Appears to be mixture of ground feed oats and screenings from other grains.
E. W. Bailey & Co. Ground Oats.....	{13.0 13.1	—	{4.9 4.9 4.7	—	{9.8 9.4 9.7	—	{3.2 3.0 3.2	—	{none none none}	As represented.
Chas. M. Cox Co. Ground Oats.....	12.6	—	4.4	—	9.2	—	3.4	—	none	As represented.
J. L. Dunnell & Son Ground Oats.....	11.8	—	4.2	—	9.3	—	3.0	—	none	As represented.
Eastern States Farmers' Exchange Inc. Eastern States Ground Oats.....	12.3	—	4.4	—	10.9	—	3.3	—	none	As represented.
Elmore Milling Co., Inc. Elmore Pure Ground Oats.....	12.3	—	4.9	—	10.3	—	3.3	—	none	As represented.
John E. Eshelman & Sons Red Rose Ground Oats.....	12.6	11.5	4.6	4.5	9.9	12	3.4	—	none	As represented.
Flambeau Milling Co. Pulverized White Oats.....	{11.5 12.2	11 11	{3.5 3.9	3.5	{10.8 10.5	{12.75 12.75	{3.9 4.1	—	{none 1.800}	Appears to be mixture of oat hulls and screenings from other grains.
Pulverized Mixed Feed Oats.....	13.0	11	4.7	3.5	11.8	12.75	5.3	2.6	8,775	Appears to be mixture of oat hulls and screenings from other grains.
General Mills, Inc. Ground Oats.....	12.9	—	5.0	—	10.5	—	3.2	—	none	As represented.

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	12.0	11	4.4	4	15.5a	12	6.3	3.8	2.700	
LaCrosse Milling Co.										
Pulverized White Oats.....										Appears to be mixture of ground oats, oat mill feed and refuse screenings.
Medium Ground White Oats.....	{12.5	11	4.9	4	13.8a	12	5.4	3.4	none	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Medium Ground White Oats.....	{12.2	11	4.2	4	14.8a	12	5.2	3.2	7.650	Appears to be mixture of ground oats, oat mill feed and refuse screenings.
Medium Ground White Oats.....	{10.8b	11	4.8	4	17.1a	12	5.6	3.5	4.725	Appears to be mixture of ground oats, oat mill feed and refuse screenings.
Medium Ground White Oats.....	{11.1	11	5.0	4	15.2a	12	5.3	3.1	3.825	Appears to be mixture of ground oats, weed seeds and screenings from other grains.
Medium Ground White Oats.....	{14.0	11	4.0	4	10.9	12	5.1	2.3	7.200	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Medium Ground White Oats.....	{12.3	11	5.2	4	14.2a	12	5.6	2.9	9.000	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Medium Ground White Oats.....	{12.6	11	4.7	4	13.1	12	5.1	2.7	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{12.1	11	4.1	4	15.2a	12.75	5.6	3.4	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{12.0	11	4.0	4	14.3a	12.75	5.4	3.2	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{12.0	11	4.4	4	14.7a	12.75	5.2	2.9	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{12.0	11	4.4	4	15.2a	12.75	5.6	3.3	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.2	11	4.3	4	14.7a	12.75	5.2	3.1	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.2	11	4.5	4	15.2a	12.75	5.7	3.6	7.425	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.2	11	4.6	4	16.3a	12.75	5.7	3.6	3.825	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.5	11	4.5	4	14.3a	12.75	5.7	3.6	4.050	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.5b	11	4.5	4	15.8a	12.75	5.5	3.4	2.700	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.2	11	4.1	4	14.7a	12.75	5.7	—	675	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{10.8b	11	5.0	4	16.8a	12.75	5.6	3.4	675	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.2	11	5.0	4	15.0a	12.75	5.6	3.6	4.275	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.8	11	4.7	4	14.0	12.75	6.4	4.1	2.700	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{12.2	11	4.8	4	14.5a	12.75	5.9	3.8	1.125	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{9.9c	11	4.4	4	14.2	12.75	6.0	3.8	2.025	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	{11.8b	11	4.4	4	14.1	12.75	5.5	—	3.380	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	12.3	11	5.0	4	14.7a	12.75	5.4	—	5.400	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Pulverized White Oats.....	12.7	11	5.4	4	13.9	12.75	5.2	3.1	2.250	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Coarse Ground White Oats.....	12.3	11	4.9	4	13.4	12.75	6.5	4.3	5.175	Appears to be mixture of ground oats, weed seeds and screenings from other grains.
Coarse Ground White Oats.....	10.8b	11	3.8	4	17.2a	12.75	5.6	3.6	10.125	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
Coarse Ground White Oats.....	12.5	11	4.4	4	13.9	12.75	5.5	3.0	9.000	Appears to be mixture of ground oats, weed seeds and screenings from other grains.
Pulverized Mixed Feed Oats.....	{12.1	10	5.0	3	15.1	14.5	6.2	3.7	3.370	Appears to be mixture of ground mixed feed oats and refuse screenings.
Pulverized Mixed Feed Oats.....	{11.2	10	4.5	3	15.9	14.5	6.7	3.6	5.400	Appears to be mixture of ground mixed feed oats and refuse screenings.
Pulverized Mixed Feed Oats.....	11.2	10	4.3	3	16.1a	14.5	5.9	3.7	—*	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.

a Fiber excessive.
 b Federal sample.
 c Deficient in protein.
 —* Whole weed seeds not determined.

Oat Products—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Whole Weed Seeds per Pound	Results of Microscopic Examination
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed				
Northern Supply Co. Pulverized White Oats.....	13.4	11	5.1	3.5	11.7	12	6.3	3.6	1,800	Appears to be mixture of oat mill feed, screenings from other grains, refuse screenings.
Pulverized White Oats.....	12.8	11	5.0	3.5	12.0	12	7.9	5.3	none	Appears to be mixture of ground mixed feed oats and refuse screenings.
Ogylvie Flour Mills Co., Ltd. Pulverized Mixed Feed Oats.....	11.8	—	5.0	—	12.9	—	5.7	—	1,125	Appears to be mixture of ground oats and screenings from other grains.
Pulverized Mixed Feed Oats.....	11.9	—	5.3	—	11.9	—	5.2	2.9	none	Appears to be mixture of pulverized mixed feed oats and refuse screenings.
Quaker Oats Co. Ground Oats.....	13.2	12	5.0	3.5	9.5	12	3.1	—	none	As represented.
Jas. Richardson & Sons, Ltd. Canadian Steam Crimped Oats.....	12.7	—	4.5	—	9.6	—	3.1	—	—*	As represented.
Ground Mixed Feed Oats.....	{ 8.3	—	3.2	—	21.8	—	4.9	—	none }	Appears to be mixture of mixed feed oats and oat mill feed.
	{ 9.6b	—	4.6	—	18.3	—	4.5	—	none }	
St. Cloud Milling Co. Pulverized White Oats.....	{ 12.0	11	4.1	3.5	13.2	12.5	9.5	2.6	none }	Appears to be mixture of oat mill feed and screenings from other grains.
Pulverized White Oats.....	{ 11.6	11	3.9	3.5	13.0	12.5	8.0	2.6	1,125 }	Appears to be mixture of ground oats, oat mill feed and screenings from other grains.
	12.6	11	5.2	3.5	13.2	12.5	4.2	—	9,000 }	Appears to be mixture of ground mixed feed oats and screenings from other grains.
Pulverized White Oats.....	12.9	11	6.1	3.5	11.6	12.5	4.4	—	900	Appears to be mixture of grain screenings, oat mill feed and refuse screenings.
Pulverized White Oats.....	11.6	11	4.9	3.5	14.7a	12.5	6.4	3.7	none	Appears to be mixture of oat mill feed and refuse screenings.
Pulverized White Oats.....	10.9	10	3.9	3.5	12.0	12.5	4.4	—	—*	Appears to be mixture of oat mill feed and screenings from other grains.
Staley Milling Co. Crimped Oats.....	12.7	12	4.5	4	8.8	11	3.3	—	—*	As represented.
Stratton & Co. Ground Oats.....	11.9	—	4.9	—	8.1	—	3.0	—	none	As represented.

Refuse Screenings

A considerable tonnage of Canadian Refuse Screenings was sold in Massachusetts during December 1949. Analysis of five samples of this product showed its composition to be mainly ground and whole weed seeds and chaff with some grain particles and sand.

The table giving the composition of eight samples of Canadian Refuse Screenings includes the results on two samples received from Maine and one sample reported from New Hampshire. Weed seeds contain relatively high percentages of fat and low percentages of fiber. Therefore the screenings containing the larger percentages of weed seeds also analyze higher in fat and lower in fiber.

Refuse Screenings

	S a m p l e							
	1	2	3	4	5	6 Maine	7 Maine	8 N. H.
Percentage								
Protein	14.7	12.5	15.1	16.2	13.9	—	—	—
Fat	6.4	5.8	9.5	9.3	6.6	—	—	—
Fiber	14.5	17.9	14.5	13.9	17.0	—	—	—
Ash	7.2	11.7	7.4	8.8	9.5	—	—	—
Sand	3.1	7.4	3.5	5.0	5.0	5.0	5.0	—
Approximate Composition (Percent)								
Chaff, hulls, etc.	30	50	25	35	40	25	40	—
Weed seeds (whole and ground)	45	30	60	60	50	60	50	—
Grain particles	20	10	10	0	5	10	5	—
Whole weed seeds per pound								
False flax	670	220	—	2,200	670	670	—	—
Pennycress or stinkweed	450	440	900	5,800	2,000	220	—	1,125
Lamb's quarters	10,700	6,700	3,600	34,500	5,900	5,400	860	52,900
Pigweeds	220	440	—	3,200	1,300	1,120	—	—
Corn cockle	—	220	—	—	—	—	—	—
Mustards	—	—	—	450	—	—	—	—
Russian thistle	—	—	—	450	—	—	—	900

On March 27, 1950, the following article was sent to the New England Commissioners of Agriculture and others concerned with this problem.

The problem of Canadian Refuse Screenings is a comparatively new one so far as the New England States are concerned. This is not true of some of the Northwestern States, particularly the State of Washington.

For a number of years before 1949 about 90 thousand tons of Canadian Refuse Screenings were shipped into Washington each year. The agricultural leaders of that State realized that it was futile to expend hundreds of thousands of dollars annually in weed eradication programs while the importation of Canadian Refuse Screenings continued. Accordingly, the Director of the State Department of Agriculture promulgated a set of rules and regulations, to become effective November 16, 1949, drastically limiting the number of viable noxious weed seeds per pound of feed. The named primary noxious weed seeds are limited to 15 per pound of feed. Named secondary noxious weed seeds are limited to 200 per pound.

It is apparently more than a coincidence that Canadian Refuse Screenings appeared on the New England scene at about the same time this product was barred from the State of Washington. At present about 2000 tons of Canadian Refuse Screenings are entering the State of Vermont each month.

The Canadian Feed Law limits the amount of certain named ground seeds that are considered injurious, including the seeds of the Mustard family, to 1 per cent. The number of certain named vital noxious weed seeds is limited to 15 per ounce.

The worst sample of Canadian Refuse Screenings examined in Massachusetts was found to contain about 60 per cent whole and ground weed seeds, 35 per cent chaff and 5 per cent dirt. It contained about 10 per cent of seeds of the Mustard family, and about 2900 whole weed seeds per ounce. These seeds are named in the Canadian Feed Law as noxious weed seeds. Germination tests show about 50 per cent of these seeds to be viable.

A letter from H. B. Sifton of the Department of Botany, University of Toronto, who had a great deal to do with the drafting of the Canadian Feed Law, states: "We did satisfy ourselves, when the Canadian Feeds Act was being considered (about 1919), that grain grown in the Canadian west contained a sufficient quantity of poisonous seed to make the screenings distinctly harmful, and that when the weed seeds screened from our Western wheat were ground up, as was the custom at that time, and mixed with the bran and middlings, the mixture was often poisonous."

The following statement appears in a letter from the Health of Animals and Plant Products Division of the Canadian Government: "There are only a few weed seeds which are injurious to the health of livestock and, of course, the most important of these are seeds of the mustard family. Ten per cent of mustard seed included in feedstuffs will cause intestinal and other trouble within a few days. Two or three per cent will not cause any noticeable injury unless fed for a considerable period of time."

Referring to the whole weed seeds found in Canadian Refuse Screenings, among others whole seeds of pennycress or stinkweed are usually present in large numbers. Quoting Nebraska Bulletin 101 entitled "Nebraska Weeds": "Pennycress is very aggressive, getting an early start in spring. It crowds and shades out the other plants that get a later start. It seeds very profusely even in grassland. When eaten by dairy cattle, pennycress imparts a bitter garlicky flavor and odor to the milk and cream and all products manufactured from the tainted milk. This odor cannot be removed by any known process and has made thousands of pounds of butter and other dairy products unsalable. Pennycress is a dreaded weed in the Northwest."

It doesn't require much imagination to visualize what serious infestation with pennycress might do to our New England pastures.

In Massachusetts we have prohibited the sale of Canadian Refuse Screenings under the provision of the Massachusetts Feed Law which forbids the sale of feeds mixed or adulterated with any substance injurious to health of livestock or poultry.

It would seem that the most effective way to deal with this problem on a regional basis would be to have the Food and Drug Administration of the Federal Security Agency bar the admission of this material. Under Section 801(a)2 of the Federal Food, Drug and Cosmetic Act under Chapter 8 covering Imports and Exports we find that "If it appears from the examination of such samples or otherwise that . . . such article is forbidden or restricted in sale in the country in which it was produced or from which it was exported . . . then such article shall be refused admission." There is not the slightest doubt that the lots of Canadian Refuse Screenings examined in Massachusetts are lots that would have been barred from sale in Canada under the Canadian Feed Law.

Fish Liver Oils and Poultry Vitamin D Supplements

L. R. Parkinson, in charge of the Nutrition Laboratory, cooperated with the Feed Control Service in the chick assay of the vitamin D feed supplements and fish liver oils.

Manufacturer and Brand	Vitamin D A. O. A. C. Chick Units per Gram Guaranteed	Remarks
Alaska Fish Oil Extractors, Inc. Alaska Brand Feeding Oil.....	800	Guarantee sustained
Dawe's Manufacturing Co. Dawe's Vitamelk Base.....	50	Guarantee sustained
Gorton-Pew Fisheries Co., Ltd. Gorton's Vitamin A & D Feeding Oil.....	400	Guarantee not sustained
Marden Wild Corp. Marden's Poultry Feeding Cod Liver Oil Marden's Feeding Oil..... Marden's Feeding Oil.....	400 400 100	Guarantee sustained Guarantee sustained Guarantee sustained
Norco Chemical Co. Cod Liver Oil with Added Vitamin A & D Concentrates.....	400	Guarantee sustained
Silmo Chemical Corp. Vitamin A & D Feeding Oil.....	400	Guarantee sustained
Vi-D-Co. Vi-D-Co Broiler	100	Guarantee sustained
Viteron Chemical Manufacturing Co. Cod Liver Oil.....	400	Guarantee sustained
Whitmoyer Laboratories, Inc. Whitmoyer Cod Liver Oil..... Whitmoyer Quality Vitamin A & D Feeding Oil..... Flav-A-Dee.....	400 400 160	Guarantee sustained Guarantee sustained Guarantee sustained

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FEEDINGSTUFFS
FOR SALE IN MASSACHUSETTS IN 1950**

- Acme-Evans Co., Inc., 902 West Washington Ave., Indianapolis 9, Ind.
 Ajax Dog Food Co., 49 Pine St. Dedham, Mass.
 Albers Milling Co., 6130 Avalon Blvd., Los Angeles 3, Cal.
 E. T. Allen Co., P. O. Box 951, Atlanta 1, Ga.
 Allied Mills, Inc., Chicago, Ill.
 American Maize-Products Co., 100 East 42nd St., New York 17, N. Y.
 Animal Foundation, Inc., Sherburne, N. Y.
 Arcady Farms Milling Co., 223 West Jackson Blvd, Chicago 6, Ill.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2, Minn.
 Ashcraft-Wilkinson Co., Trust Co. of Georgia Bldg., Atlanta 3, Ga.
- Edward R. Bacon Grain Co., 177 Milk St., Boston, Mass.
 E. W. Bailey & Co., Montpelier, Vt.
 Bannock Food Co., Inc., West Chester, Penn.
 Barber & Bennett, Inc., Albany, N. Y.
 Barnett & Co., Ltd., 300 Le Moyne St., Montreal, Canada
 Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
 Battle Creek Dog Food Co., 60 East State St., Battle Creek, Mich.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Dog Food Co., 447 Timpson Place, Bronx 55, N. Y.
 Best Foods, Inc., 1442 Marine Trust Bldg., Buffalo 3, N. Y.
 Birdwood Products Co., Route 1, Box 89, North Platte Neb.
 Black Rock Milling Corp., 356 Heitel Ave., Buffalo 7, N. Y.
 Blatchford Calf Meal Co., 2 Madison St., Waukegan, Ill.
 Blatchley & Ballard, Inc., P. O. Box 360, Middletown, Conn.
 Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
 Borden Grain Co., 700 West Water St., Taunton, Mass.
 Borden's Soy Processing Co., Division of the Borden Co., Kankakee, Ill.
 Brown-Forman Distillers Corp., 1908 Howard St., Louisville, Ky.
 Geo. B. Brown Corp., Ipswich, Mass.
 Brown Oil & Chemical Corp., 2581 Richmond Ter., Staten Island 2, N. Y.
 Buckeye Cotton Oil Co., Cincinnati 1, Ohio
- A. B. Caple Co., Toledo 5, Ohio
 Cargill, Inc., 200 Grain Exchange, Minneapolis, Minn.
 CarO-Green, Inc., 328 Board of Trade Bldg., Kansas City, Mo.
 Central Mills, Inc., Dunbridge, Ohio
 Central Soya Co., 300 Fort Wayne Bank Bldg., Fort Wayne, Ind.
- Champion Animal Food Co., 751 Taft St. N. E., Minneapolis 1, Minn.
 H. E. Clark Co., 419 Main St., Winfield, Kan.
 Clinton Foods, Clinton, Iowa
 Coatsworth and Cooper, Ltd., 67 Yonge St., Toronto, Ont., Canada
 Commander-Larabee Milling Co., 600 Baker Arcade, Minneapolis, Minn.
 Community Service, Inc., Canaan, Conn.
 Connecticut Dried Grains Colchester, Conn.
 Consolidated Products Co., 119 North Washington Ave., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Copeland Flour Mills, Ltd., Midland, Ont., Canada
 Corn Products Refining Co., 17 Battery Place, New York 4, N. Y.
 Courcy & Sons Grain Co., Taunton, Mass.
 Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston 9, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
 Curley Grain & Fuel Co., Wakefield, Mass.
- Dailey Mills, Inc., Olean, N. Y.
 Da'rymen's League Co-operative Assn., Inc., 11 West 42nd St., New York 18, N. Y.
 Dawe's Manufacturing Co., 4800 South Richmond St., Chicago 32, Ill.
 Dawnwood Farms, Smithfield Road, Amenia, N. Y.
 Decatur Milling Co., Inc., 717 North Union St. Decatur, Ill.
 Dehydrating Process Co., 10 High St., Boston 10, Mass.
 Delaware Mills, Inc., Deposit, N. Y.
 Delphos Grain & Soya Products Co., 201 South Jefferson St., Delphos, Ohio
 Derwood Mills, Inc., Derwood, Md.
 Frank Diauto, Randolph, Mass.
 F. Diehl & Son, Inc., 180 Linden St., Wellesley 81, Mass.
 Dietrich & Gambrell, Inc., South Carroll St., Frederick, Md.
 Dover Milling Co., Dover, Ohio
 John C. Dow Co., 40 Prospect St., Gloucester, Mass.
 Drackett Products Co., 5020 Spring Grove Ave., Cincinnati 32, Ohio
 E. I. du Pont de Nemours & Co., Wilmington, Del.
- Eagle Roller Mill Co., New Ulm, Minn.
 East Longmeadow Grain Store, East Longmeadow, Mass.
 Eastern States Farmers' Exchange, Inc., West Springfield, Mass
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 Elk Valley Alfalfa Mills, a Division of Midland Industries, Inc., Independence, Kan.
 Elmore Milling Co., Inc., Oneonta, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Assn., Topsfield, Mass.
 Excelsior Milling Co., 712 Flour Exchange Bldg., Minneapolis, Minn.

Farmont Foods Co., 1202-06 Jones St., Omaha 8, Neb.
 Falk & Co., 1617 Pennsylvania Blvd., Philadelphia 3, Penn.
 Farm Bureau Assn., 155 Lexington St., Waltham 54, Mass.
 Farmers Feed Co., 532 East 76th St., New York, N. Y.
 Feed Products, Inc., Groveland, Florida
 Fernando Alfalfa Milling Co., 6104 Van Nuys Blvd., Van Nuys, Cal.
 Ferneau Grain Co., Blanchester, Ohio
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Florida Citrus Canners Cooperative, Lake Wales, Florida
 Flory Milling Co., Inc., Bangor, Penn.
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.

General Foods Corp., 250 Park Ave., New York 17, N. Y.
 General Foods Corp., Corn Mill Division, Kankakee, Ill.
 General Foods Corp., Post Cereals Division, Battle Creek Mich.
 General Mills, Inc., 400 Second Ave. S., Minneapolis, Minn.
 General Mills, Inc., Farm Service Division, 150 River St., Fitchburg, Mass.
 General Mills, Inc., Larowe Division, Detroit 2, Mich.
 Gerard Co., 4101 East Monument St., Baltimore 5, Md.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis, Ind.
 Glidden Co., Soya Products Division, 5165 West Moffat St., Chicago 39, Ill.
 Gloucester By-Products, Inc., Gloucester, Mass.
 Godchaux Sugars, Inc., P. O. Box 583, New Orleans 7, La.
 Gorton-Pew Fisheries Co., Ltd., 327 Main St., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., New York, N. Y.
 Green Acre Farms, Nazareth, Penn.

Hales & Hunter Co., 141 West Jackson Blvd., Chicago, Ill.
 D. Harbeck & Sons, 405 Earle St., New Bedford, Mass.
 Harper Feed Mills, Inc., 271 West Wheeling St., Washington, Penn.
 Hartz Mountain Products, 36 Cooper Square, New York 3, N. Y.
 Hercules Powder Co., Dairy Products Division, 821 Marquette Ave., Minneapolis 2, Minn.
 Dr. Hess & Clark, Inc., 7th & Orange Streets, Ashland, Ohio
 Hi-Life Packing Co., 431 South Dearborn St., Chicago 5, Ill.
 Hood Mills Co., 4101 East Monument St., Baltimore 5, Md.
 H. P. Hood & Sons, Inc., 560 Rutherford Ave., Boston 29, Mass.
 Hubinger Co., 601 Main St., Keokuk, Iowa
 Humphreys-Goodwin Co., Memphis, Tenn.

Illinois Cereal Mills, Inc., 613 South Jefferson Ave., Paris, Ill.
 Independent Tallow Co., 39 Cedar St., Woburn, Mass.
 Industrial Molasses Corp., 904 Plymouth Bldg., Minneapolis 2, Minn.
 International Milling Co., 800 McKnight Bldg., Minneapolis, Minn.

Jaquith & Co., 305 Main St., Woburn, Mass.

Kansas Flour Mills Co. (Trade Name) of Flour Mills of America, Inc., Kansas City 13, Mo.
 Kasco Mills, Inc., 435 Fulton St., Waverly, N. Y.
 Kellogg Co., Battle Creek, Mich.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 Kennel Food Supply Co., Inc., 63 Mill Hill Ter. Fairfield, Conn.
 H. H. King Flour Mills Co., 1010 Grain Exchange, Minneapolis, Minn.
 H. C. Knoke & Co., 5728 West Roosevelt Road, Chicago 50, Ill.
 Kraft Foods Co., 500 Peshigo Court, Chicago 90, Ill.
 Chas. A. Krause Milling Co., P. O. Box 1156, Milwaukee 1, Wis.
 Kronick's Coal & Grain Co., 43 Pleasant St., Adams, Mass.
 Kuder Citrus Pulp Co., Lake Alfred, Florida

Larabee Flour Mills Co., Kansas City 6, Mo.
 Lauhoff Grain Co., 321 East North St., Danville, Ill.
 Lawrence Milling Co., Inc., 7020 South Broadway, St. Louis, Mo.
 Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.
 Lincoln Mills, Inc., 1203 West 23rd St., Indianapolis 8, Ind.
 L. B. Lovitt & Co., Memphis, Tenn.

Maine Fish Meal Co., Union Wharf, Portland, Maine
 Mansfield Milling Co., Mansfield, Mass.
 Marianna Sales Co., 510 Cotton Exchange Bldg., Memphis, Tenn.
 Marine By-Products Co., 10 High St., Boston, Mass.
 Maritime Milling Co., Inc., 1609 Chamber of Commerce, Buffalo 2, N. Y.
 Merrimack Farmers' Exchange, Inc., Concord, N. H.
 Methuen Grain Co., Inc., Methuen, Mass.
 Mimer-Hillard Milling Co., 826 Second National Bank Bldg., Wilkes-Barre, Penn.
 Minute Maid Corp., P. O. Box 720, Leesburg, Florida
 Geo. Q. Moon & Co., Inc., 201 Chenango St., Binghamton, N. Y.
 Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.
 Morton Salt Co., 120 South La Salle St., Chicago 3, Ill.
 Mount Vernon Milling Co., Mount Vernon, Ind.

National Alfalfa Dehydrating & Milling Co., Lamar, Col.
 National Biscuit Co., 449 West 14th St., New York 14, N. Y.
 National Biscuit Co., Toledo Mill, 2221 Front St., Toledo, Ohio
 National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
 Near's Food Co., Inc., 115 Montgomery St., Binghamton, N. Y.
 Neumond Co., Merchants Exchange Bldg., St. Louis 2, Mo.
 New Bedford Fish Products Corp., New Bedford, Mass.

Ogden Grain Co., Utica, N. Y.
 Old Mother Hubbard Dog Food Co., Inc., 40 Prospect St., Cloucester, Mass.
 Old Trusty Dog Food Co., Inc., 278 West St., Needham Heights 94, Mass.
 Oswego Soy Products Corp., Oswego, N. Y.
 Owensboro Grain Co., Inc., 102 Lewis St., Owensboro, Ky.

Palm Grain Co., Lowell, Mass.
 Park & Pollard Co. Inc., 356 Hertel Ave., Buffalo 7, N. Y.
 George H. Parker Grain Co., 56 Water St., Danvers, Mass.
 Parrish & Heimbecker, Ltd., Montreal, Canada
 Pasco Packing Co., Dade City, Florida
 Patent Cereals Co., Geneva, N. Y.
 Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa
 Perkins Oil Co., 727 Beale Ave., Memphis, Tenn.
 Pilgrim Feed Co., 22 Savoy St., Providence, R. I.
 Pillsbury Mills, Inc., Minneapolis 2, Minn.
 Pittsburgh Plate Glass Co., 118 Main St., Red Wing, Minn.
 Pittsford Flour Mills, Inc., Schoen Place, Pittsford, N. Y.
 Plymouth Citrus Products Corp., Plymouth, Florida
 R. C. Pratt & Co., Ltd., 18 Toronto St., Toronto, Ont., Canada
 Publicker Industries, Inc., 1429 Walnut St., Philadelphia 2, Penn.

Quaker Oats Co., Merchandise Mart Plaza, Chicago 54, Ill.

Ralston Purina Co., 835 South 8th St., St. Louis, Mo.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
 D. F. Riley, North Hatfield, Mass.
 Riverside Elevator Co., 4450 Penobscot Bldg., Detroit, Mich.
 Rodney Milling Co., 1150 West 29th St., Kansas City 8, Mo.
 Rudhard Products, Inc., 248 Michigan Ave., Buffalo 3, N. Y.
 Russell-Miller Milling Co., 900 Midland Bank Bldg., Minneapolis 1, Minn.
 Ryther & Warren Co., Belchertown, Mass.

Saunders Mills, Inc., Toledo, Ohio
 Schenley Distillers, Inc., 350 Fifth Ave., New York 1, N. Y.
 Schooneck Farms, Inc., Nazareth, Penn
 Sea Board Supply Co., 35th & Grays Ferry Ave., Philadelphia 46, Penn.
 Joseph E. Scagram & Sons, Inc., Louisville 1, Ky.
 Sherwin Williams Co., 101 Prospect Ave., Cleveland, Ohio
 David Small, East Hartford, Conn.
 W. J. Small Co., Inc., 1200 Oak St., Kansas City, Mo.
 Allen V. Smith, Inc., Marcellus Falls, N. Y.
 Spratt's Patent (America) Ltd., 18 Congress St., Newark 5, N. J.
 Staley Milling Co., 1717 Armour Road, Kansas City 16, Mo.
 Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
 Stratton & Co., 57 Commercial St., Penacook, N. H.
 Suni-Citrus Products Co., 601 Trust Co. of Georgia Bldg., Atlanta 3, Ga.
 Sunshine Biscuits, Inc., Milling Division, Grafton, Ohio.
 Swift & Co., Union Stock Yards, Chicago 9, Ill.
 Swift & Co. Soybean Mill, Fostoria, Ohio

Taunton Grain Co., Taunton, Mass.
 Tioga Mills, Inc., Waverly, N. Y.

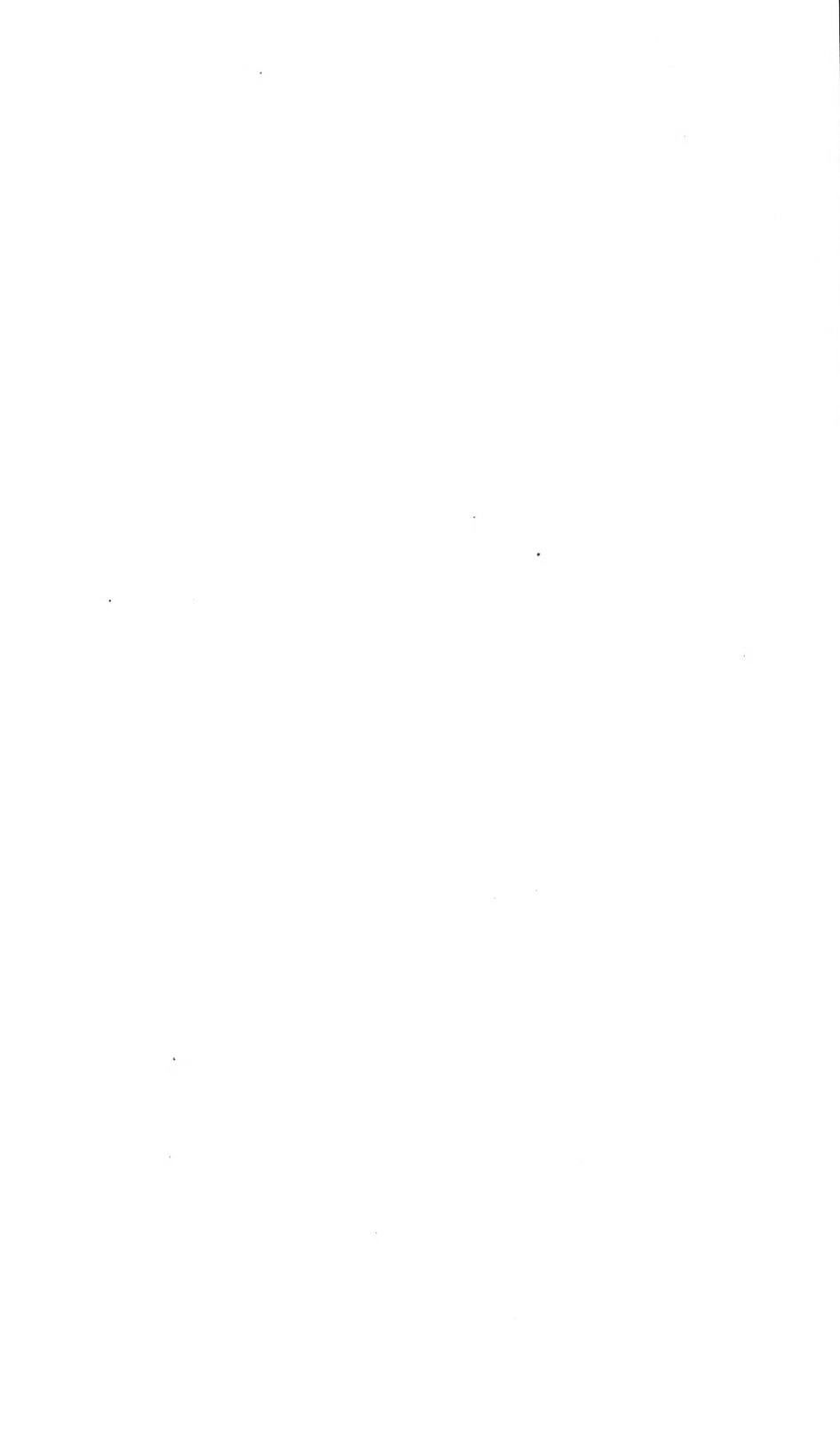
Union Starch & Refining Co., 301 Washington St., Columbus, Ind.
 United Cooperative Farmers, Inc., Fitchburg, Mass.
 United Distillers of America, Inc., 350 Fifth Ave., New York, N. Y.
 Unity Feeds, Inc., 177 Milk St., Boston, Mass.
 Universal Grain Co. of New Jersey, 425 South St., Newark, N. J.
 Universal Grain Corp., 2 Broadway, New York, N. Y.
 George Urban Milling Co., 332 North Oak St., Buffalo, N. Y.

Valier & Spies Milling Co. (Trade Name) of Flour Mills of America, Inc., Kansas City 13, Mo.
 Van Iderstine Co., Long Island City 1, N. Y.
 Ventura Grain Co., 7 Purchase St., Taunton, Mass.

Hiram Walker & Sons, Inc., Peoria, Ill.
 C. P. Washburn Co., Middleboro, Mass.
 H. K. Webster Co., Lawrence, Mass.
 Western Condensing Co., 411 Battery St., San Francisco, Cal.
 Whitmoyer Laboratories, Inc., Myerstown, Penn.
 Stanley Wood Grain Co., Taunton, Mass.
 Worcester Grain & Coal Co., 294 Franklin St., Worcester 8, Mass.
 Worcester Salt Company, a Division of Morton Salt Co., 40 Worth St., New York 13, N. Y.

Yieldmor Feeds, Inc., 101 South Downing St., Piqua, Ohio

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MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 145

JULY 1950

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

By Fertilizer Control Service Staff

This is the seventy-seventh report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1950

BY FERTILIZER CONTROL SERVICE STAFF

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tysen Smith, *Assistant Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
Edward S. Berestka, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesium.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1

Tonnage fee: 6 cents per ton of 2,000 pounds

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN. W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

FERTILIZER TONNAGE
Tonnage of Fertilizers Sold in Massachusetts

	1948		1949	
	Jan. 1 to July 1	July 1 to Dec. 31	Jan. 1 to July 1	July 1 to Dec. 31
Mixed fertilizers.....	58,560	8,583	59,696	7,006
Fertilizer chemicals and materials unmixed.....	9,238	3,529	9,964	3,403
Pulverized animal manures.....	1,322	401	1,234	578
Totals.....	69,120	12,513	70,894	10,987

Tonnage of Mixed Fertilizers, January 1 to December 31, 1949

Grade *	Tonnage		Brands	Grade *	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31			Jan. 1 to July 1	July 1 to Dec. 31	
5-10-10	14,899	1,209	24	5-10-3	270	242	—
5-8-7	12,263	936	18	5-15-15	243	118	—
6-3-6	9,091	73	10	4-12-6	227	158	—
7-7-7	5,854	957	14	9-7-4	195	66	—
4-12-4	3,303	505	12	0-19-19	132	92	—
5-10-5	2,844	408	24	6-5-5	132	—	—
0-14-14	2,681	528	9	0-20-20	130	154	—
8-16-16	1,955	286	7	5-3-5	75	—	—
3-12-6	925	6	—	6-8-6	51	78	—
10-10-10	799	348	—	4-8-4	36	14	—
5-15-10	687	25	—	7-11-5	35	10	—
8-4-8	549	5	—	5-8-5	34	18	—
3-12-12	485	299	—	10-6-4	21	14	—
8-6-2	422	96	5	4-4-2	10	10	—
8-6-4	412	149	6	6-2-1	10	—	—
5-5-15	318	1	—	7-8-5	10	—	—
6-10-4	309	93	—	8-12-12	—	72	—
4-12-8	296	13	5	Miscellaneous	53	23	22
				TOTALS	59,696	7,005	189

* The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1 to December 31, 1949

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Superphosphate.....	2,506	1,292	9
Process tankage and activated sewage	2,036	1,012	—
Nitrate of soda.....	1,835	205	—
Cottonseed Meal.....	1,662	180	5
Pulverized animal manures.....	1,234	578	26
Bone meal.....	754	215	12
Muriate of potash.....	292	158	7
Rock phosphate.....	230	161	—
Cyanamid.....	135	10	—
Ammonium nitrate.....	124	68	—
Castor pomace.....	108	38	—
Linseed meal.....	91	—	—
Urea compounds.....	74	13	—
Dry ground fish.....	63	37	—
Sulfate of ammonia.....	38	—	—
Miscellaneous.....	16	14	—
TOTALS.....	11,198	3,981	84

MIXED FERTILIZERS
Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With No Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
Adco Works.....	1	1	3	0	0	0	0
American Agricultural Chemical Co....	42	19	125	16	7	0	2
Apothecaries Hall Co.....	21	21	66	0	0	0	0
Armour Fertilizer Works.....	12	9	36	0	2	1	0
Associated Seed Growers, Inc.....	1	1	3	0	0	0	0
Joseph Breck & Sons Corp.....	3	2	7	1	0	0	0
Consolidated Rendering Co.....	17	12	50	3	1	1	1
Davison Chemical Corp.....	4	0	12	4	1	0	0
Eastern States Farmers' Exchange, Inc.	13	8	49	2	1	1	2
Essex County Cooperative Farming Association.....	3	3	10	0	0	0	0
Excell Laboratories, Inc.....	1	1	3	0	0	0	0
Farrar Bureau Assn.....	5	3	15	1	1	0	0
Fox Point Chemical Co.....	5	3	15	1	0	1	0
Frank's Market Garden.....	1	1	3	0	0	0	0
Frost & Higgins Co.....	1	1	3	0	0	0	1
Gouldard & Olena, Inc.....	2	1	6	0	0	0	0
A. H. Hoffman, Inc.....	1	1	3	0	0	0	0
Hydronom Chemical Co., Inc.....	1	1	3	0	0	0	0
Hy-Trous Corp.....	1	1	3	0	0	0	0
International Minerals & Chemical Corp.....	13	12	45	0	1	0	0
Lexington Gardens, Inc.....	1	0	3	0	0	1	0
Miller Chemical & Fertilizer Corp....	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.....	22	20	68	2	1	0	0
Olds & Whipple, Inc.....	6	6	18	0	0	0	0
F. G. Phillips Co.....	4	1	3	0	0	0	0
Rogers & Hubbard Co.....	20	16	60	1	2	0	1
Rose Manufacturing Co.....	1	1	3	0	0	0	0
O. M. Scott & Sons Co.....	2	2	6	0	0	0	0
Sears, Roebuck & Co.....	6	3	18	1	0	0	2
M. L. Shoemaker Div. of Wilson & Co., Inc.....	1	1	2	0	0	0	0
Swift & Company Plant Food Division	3	3	9	0	0	0	0
Tennessee Corp.....	2	1	6	2	0	0	0
I. P. Thomas & Son Co.....	1	1	3	0	0	0	0
Universal Chemical Co.....	1	1	3	0	0	0	0
C. P. Washburn Co.....	2	0	6	2	0	1	0
Woodruff Fertilizer Works, Inc.....	1	1	3	0	0	0	0
F. H. Woodruff & Sons, Inc.....	1	0	3	1	0	1	0
TOTALS.....	220	159	677	37	17	7	9

Explanation of Table of Analyses

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash and in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers which meet their guarantees in every respect, this table includes also those mixtures which have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

This table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers which carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More per Ton

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Approximate Commercial Shortage Per Ton
	Water Insoluble Organic	Total			
American Agricultural Chemical Co.					
Agrico for Seeding Down 3-12-12.....	.16	3.00	11 01	12.06	\$1.67
Agrico for Corn 3-12-4.....	.18	4.06	11.16	4.18	1.05
Consolidated Rendering Co.					
Corenco Home Garden 5-10-5	.11	5.07	8 94	5.02	1.56
Eastern States Farmers' Exchange, Inc.					
Eastern States 0-19-19 with Borax 5%.....	—	—	17 61	19.40	2.03
Goulard & Olena, Inc.					
G & O Rhodo-Azalea- Camellia Food 3-20-3.....	1.29	4.70	14 00	9.84	<i>a</i>
F. H. Woodruff & Sons, Inc.					
Gro-Sod 10-6-4.....	.13	9.36	6.85	3.97	3.34

a Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient mixtures.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Adco Works		
Vivo 17-34-16	1	none
American Agricultural Chemical Co.		
AA Quality 0-14-14	15	—
AA Quality 3-12-6	1	.13
AA Quality 4-12-4	1	.14
AA Quality 5-8-7	8	.12
AA Quality 5-10-10	7	.13
AA Quality 7-7-7	7	.08
Agrico Phosphate & Potash 0-14-14	1	—
Agrico for Corn 3-12-6	1	.14
Agrico for New England 5-8-7	4	.12
Agrico for Cranberries 5-10-5	1	.14
Agrico for Gardens 5-10-5	1	.18
Agrico for Onions 5-10-5	3	.13
Agrico for Truck 5-10-5	1	.12
Agrico for Potatoes 5-10-10	2	.15
Agrico for Potatoes 5-10-10 with 2% magnesium oxide	2	.21
Agrico for Tobacco 6-3-6	6 a	2.62
Agrico Broadleaf Evergreens 6-10-4	1	.48
Agrico Country Club 6-10-4	1	.35
Agrico for Lawns, Trees & Shrubs 6-10-4	1	.44
Agrico for Cranberries 7-7-7	1	.16
Agrico for Top Dressing 7-7-7	3	.11
Agrico Country Club 8-6-2	1	1.38
Apothecaries Hall Co.		
Liberty 4-12-4	1	.42
Liberty High Grade Market Garden 5-8-7	1	.47
Liberty High Grade Market Garden 5-8-7 with 1.2% magnesium	1	.16
Liberty 5-10-5	2	.48
Liberty 5-10-10	3	.38
Liberty 5-10-10 with 1.2% magnesium	2	.35
Liberty Tobacco Mixture 6-3-6	5 a	3.22
Liberty Tobacco Mixture with Cotton Hull Ashes 6-3-6	2 a	3.19
Liberty Green Gro 6-7-4	1	1.20
Liberty Special for Fruit & Grass 7-7-7	3	.41
Armour Fertilizer Works		
Armour's Big Crop 0-14-14	1	—
Armour's Big Crop Tobacco Starter 5-5-15	1 a	.89
Armour's Big Crop 5-8-7	1	.19
Armour's Big Crop 5-10-5	1	.24
Armour's Vertagreen Plant Food 5-10-5	1	.30
Armour's Big Crop 5-10-10	1	.18
Armour's Big Crop 5-10-10 with sulphur	1	.17
Armour's Big Crop 5-10-10 with 2% magnesium oxide	1	.22
Armour's Big Crop Tobacco Special 6-3-6	1 a	2.08
Armour's Big Crop 7-7-7	1	.24
Armour's Special Golf Course Plant Food 8-6-2	1	1.60
Armour's Special Ornamental 10-6-4	1	.15
Associated Seed Growers, Inc.		
Japedizer 9-6-4	1	1.11
Joseph Breck & Sons Corp.		
Breck's Country Club 8-6-2	1	.59
Brexone Garden-Gro 5-10-10, 2% magnesium oxide	1	.32
Brexone Turf-Gro 8-6-2	1	.54
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser	5	—
Corenco 4-12-4 Complete Manure	21	.11
Corenco 4-12-16 Ladino Special	1	.18
Corenco 5-8-7 Potato & General Crop	4	.20
Corenco 5-10-5 Onion Special-Super Truck	1	.07
Corenco 5-10-10 Peerless Potato	14	.12
Corenco 6-3-6 Special Tobacco Grower	1 a	3.59
Corenco 7-7-7 Complete Fruit & Top Dressing	11	.12
Corenco 8-6-4 Landscape	1	.86
Corenco 8-12-16, 1.5% magnesium oxide	1	.27
Davco Chemical Corporation		
Davco Granulated 5-8-7	1	.09
Davco Granulated 5-10-5	1	.18
Davco Granulated 5-10-10	1	.09
Davco Granulated 7-7-7	1	.09

* Potash in forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Eastern States Farmers' Exchange, Inc.		
Eastern States 0-20-20.....	1	—
Eastern States 5-10-10, 1% magnesium oxide.....	1	.11
Eastern States 5-15-10, 1% magnesium oxide.....	1	.11
Eastern States 5-15-15, 1% magnesium oxide.....	1	.18
Eastern States 6-4-6 Tobacco, 2% magnesium oxide.....	1 a	2.98
Eastern States 8-4-8 Tobacco, 2% magnesium oxide.....	2 a	3.35
Eastern States 8-12-12 Low Chlorine, 2% magnesium oxide.....	1 a	.18
Eastern States 8-12-12, 2% soluble magnesium oxide.....	1	.22
Eastern States 8-16-16, 1% magnesium oxide.....	1	.15
Eastern States 10-10-10, 1% magnesium oxide.....	2	.12
Eastern States Plant Starter 10-52-17.....	1	.07
Essex County Cooperative Farming Association		
S-X Brand 5-8-7.....	1	.12
S-X Brand 5-10-10, 2% soluble magnesium oxide.....	1	.37
S-X Brand 7-7-7.....	1	.18
Excell Laboratories, Inc.		
New Plant Life 2-1-2.....	1	none
Farm Bureau Association		
Farm Bureau 4-12-8.....	1	.05
Farm Bureau 5-8-7.....	1	.06
Farm Bureau 5-10-10.....	1	.13
Farm Bureau 7-7-7.....	1	.14
Farm Bureau 8-6-2.....	1	1.11
Fox Point Chemical Co.		
Old Fox Brand 4-12-16.....	1	.07
Old Fox Brand 5-8-7.....	1	.11
Old Fox Brand 5-10-10, 1% magnesium oxide.....	1	.08
Old Fox Brand 7-7-7.....	1	.21
Old Fox Brand 8-6-2.....	1	1.54
Frank's Market Garden		
F.M.G. (For More Growth) 0.9-0.9-0.9.....	1	.55
Frost & Higgins Co.		
Special Tree and Shrub Food 8-6-4.....	1	.47
Gouldard & Olena, Inc.		
G & O Rose Food 7-8-5.....	1	1.21
A. H. Hoffman, Inc.		
Hoffman Rose Food 5-10-5.....	1	1.87
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19.....	1	none
Hy-Trous Corporation		
Hy-Trous 4-8-4.....	1	none
International Minerals & Chemical Corporation		
International 0-14-14.....	1	—
International 4-12-8, 1% magnesium oxide.....	1	.16
International 4-12-16.....	1	.12
International 5-8-7, 1% magnesium oxide.....	1	.11
International 5-10-5.....	1	.40
International 5-10-10, 1% magnesium oxide.....	1	.09
International 5-10-10, 2% magnesium oxide.....	2	.40
International Tobacco 6-3-6.....	1 a	3.15
International 7-7-7, 1% magnesium oxide.....	1	.14
International Fruit 7-7-7, 3% magnesium oxide.....	1	.03
International 8-6-2 for Lawn.....	1	.72
International 8-16-16.....	1	.20
Lexington Gardens, Inc.		
Luxuro Plant Food 5-10-3.....	1	2.10
Miller Chemical & Fertilizer Corporation		
Soluble Fertilizer VHPF 5-25-15.....	1	none
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 0-14-14.....	1	—
Old Deerfield 4-12-8.....	1	.18
Old Deerfield 5-5-15 Tobacco Starter.....	1	1.13
Old Deerfield 5-8-7 All Crop.....	4	.54

^a Potash in forms other than muriate

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Old Deerfield Fertilizer Co., Inc.—Concluded		
Old Deerfield 5-8-7, 2% magnesium oxide, potash other than muriate	1 a	.62
Old Deerfield 5-10-5 Trucker's Special	1	.30
Old Deerfield 5-10-10 Potato	2	.10
Old Deerfield 5-10-10, 2% magnesium oxide, potash other than muriate	2 a	.24
Old Deerfield 6-3-6 Complete Tobacco	4 a	3.07
Old Deerfield Lawshrub 6-5-5	1	1.37
Old Deerfield 7-7-7 Grass Top Dressing	3	.13
Old Deerfield 8-16-16	1	.25
Olds & Whipple, Inc.		
O & W 5-3-5 Complete Tobacco, potash derived from cotton hull ash with copper added	1 a	2.71
O & W 5-8-7 Potato & General Purpose	1	.83
O & W 5-10-5	1	.74
O & W 5-10-10 Potato	1	.59
O & W 6-3-6 Blue Label Tobacco, potash derived from cotton hull ash	1 a	3.45
O & W 7-7-7 Top Dressing & Grass	1	.47
F. G. Phillips Co.		
Ferti-Flora 3-3-3	1	none
Plantabbs Corporation		
Fulton's Plantabbs 11-15-20	1	none
Rogers & Hubbard Co.		
Gro-Fast Plant Food 5-10-5	1	1.20
Hubbard Alfalfa 0-14-14	1	none
Hubbard Seeding 3-12-12	1	.39
Hubbard Corn 4-12-4	2	.45
Hubbard Potato 5-8-7	2	.82
Hubbard Vegetable 5-8-7	1	.41
Hubbard General Crop 5-10-10	2	.34
Hubbard High Potash 5-10-10	1	1.29
Hubbard High Potash 5-10-10 with 2% magnesium oxide	1	1.26
Hubbard Tobacco Grower 6-3-6	3 a	3.22
Hubbard Weed Kill Lawn Food 6-10-4	1	.85
Hubbard Top Dressing 7-7-7	2	.37
Hubbard Double Strength 8-16-16	1	.37
Hubbard Special Mix 10-10-10	1	.20
Rose Manufacturing Co.		
Triogen Rose Food 5-10-5	1	.49
O. M. Scott & Sons Co.		
Scotts Weed & Feed 7-11-5	1	3.54
Scotts Turf Builder 9-7-4	1	2.90
Sears, Roebuck & Co.		
Cross Country Bulb Food 4-12-8	1	.62
Cross Country Lawn Food & Weed Killer 5-10-5	1	.32
Cross Country Plant Food 5-10-5	1	.11
Cross Country Rose Food 5-10-5	1	1.60
Cross Country Evergreen Food 8-6-4	1	.32
Cross Country Liquid Plant Food 10-5-5	1	none
M. L. Shoemaker Division of Wilson & Co., Inc.		
"Swift-Sure" 4-10-0	1	.72
Stimulant Laboratories Co.		
Stim-U-Plant Plant Food Tablets 11-12-15	1	.19
Swift & Co. Plant Food Division		
Vigoro 4-12-4	2	.27
Vigoro 5-10-5	1	.25
Tennessee Corporation		
Loma 5-10-5	1	.69
Loma 8-8-8 Mineralized	1	.27
I. P. Thomas & Son Co.		
I. P. Thomas 5-8-7	1	.10
Universal Chemical Co.		
Electra Plant Food 5-10-3	1	1.79
C. P. Washburn Co.		
Washburn's Market Garden 5-8-7	1	.15
Washburn's Special Potato 5-10-10	1	.13
Woodruff Fertilizer Works, Inc		
Woodruff's 5-8-7	1	.53

* Potash in forms other than muriate.

NITROGEN COMPOUNDS

Agrinite, Ammonium Nitrate, Calcium Cyanamid, Castor Pomace,
Cottonseed Meal, Nitrate of Soda, Sulphate of Ammonia

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
American Agricultural Chemical Co.		
Agrinite.....	{ 8.38 8.57	8.25 8.25
American Cyanamid Co.		
Aero Cyanamid 20.6%.....	20.61	20.60
Aero Cyanamid, Special Grade.....	22.37	21.00
Aeroprills Ammonium Nitrate Fertilizer.....	34.45	33.50
Ashcraft-Wilkinson Co.		
Cow-Eta Brand 41% Protein Cottonseed Meal.....	6.50	6.56
Barrett Division, Allied Chemical & Dye Corp.		
A-N-L Brand Fertilizer Compound.....	20.84	20.50
Arcadian the American Nitrate of Soda.....	16.24	16.00
Central Chemical Corp.		
Farmrite Sulfate of Ammonia.....	20.96	20.50
Chilean Nitrate Sales Corp.		
Chilean Nitrate of Soda—Champion Brand.....	{ 16.08 ^a 16.31 16.30	16.00 16.00 16.00
Spencer Kellogg & Sons, Inc.		
Castor Pomace.....	5.79	5.55
Old Deerfield Fertilizer Co., Inc		
Sulphate of Ammonia.....	20.80	20.50
Sears, Roebuck & Co.		
Cross Country Sulfate of Ammonia 20%.....	21.10	20.00

^a Composite of 7 samples.

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Ground Bone, Dry Ground Fish, Milorganite, Animal Tankage

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
American Agricultural Chemical Co. Bone Meal.....	2.72	2.50	26.88	20.00
Armour Fertilizer Works Bone Meal.....	2.69	2.30	26.32	23.00
Central Chemical Corp. Farmrite Bone Meal.....	2.83	2.30	24.99	20.00
Consolidated Rendering Co. Corenco Ground Bone.....	2.20	2.00	26.32	23.00
Corenco Special Ground Bone.....	3.81	3.70	20.25	20.00
Faesy & Besthoff, Inc. Pure Bone Meal.....	2.94	2.47	26.67	23.00
A. H. Hoffman, Inc. Bone Meal (Raw).....	4.26	3.70	23.10	20.00
International Minerals & Chemical Corp. Bone Meal.....	2.31	2.47	29.58	23.00
Old Deerfield Fertilizer Co., Inc. Dry Ground Fish.....	10.19	9.00	7.07	5.00
John Reardon & Sons Division of Wilson & Co., Inc. Rearco Ground Bone.....	2.63	2.00	27.03	18.00
Rogers & Hubbard Co. Gro-Fast Bone Meal.....	2.59	2.00	26.01	23.00
N. Roy & Son Animal Tankage.....	7.66	7.00	12.17	8.00
Sears, Roebuck & Co. Cross Country Bone Meal.....	2.46	2.00	27.08	20.00
Sewerage Commission of the City of Milwaukee Milorganite (a).....	6.06	6.00	3.06	—

a Available phosphoric acid found, 2.42%; guaranteed 2%.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co. 18% Normal Superphosphate.....	(18.77 ^a 18.46	18.31 18.00	18.00 18.00
Armour Fertilizer Works Armour's Big Crop Superphosphate 20%.....	20.76	19.62	20.00
Consolidated Rendering Co. Corenco Superphosphate 20%.....	(21.06 ^b 20.96	20.02 20.12	20.00 20.00
Davison Chemical Corp. Davco Granulated Superphosphate 20%.....	21.68	20.05	20.00
Eastern States Farmers' Exchange, Inc. Eastern States Superphosphate 20%.....	21.47	20.73	20.00
Farm Bureau Association Farm Bureau Superphosphate 20%.....	20.40	20.22	20.00
International Minerals & Chemical Corp. International Superphosphate 20%.....	(21.75 ^c 21.88	20.00 20.00	20.00 20.00
Old Deerfield Fertilizer Co., Inc. Old Deerfield Superphosphate 20%.....	21.06	20.44	20.00
Rogers & Hubbard Co. Hubbard's Superphosphate 20%.....	21.17	20.11	20.00
Thomson Phosphate Co. Four Leaf Powdered Rock Phosphate.....	31.37 ^d	—	—

a Composite of 3 samples

b Composite of 2 samples

c Composite of 7 samples

d Guaranteed 31% total phosphoric acid

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Eastern States Farmers' Exchange, Inc.....	61.10	60.00
International Minerals & Chemical Corp.....	59.80	60.00
Old Deerfield Fertilizer Co., Inc.....	60.60	60.00
Rogers & Hubbard Co.....	59.30	60.00

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash
American Agricultural Chemical Co. Pulverized Sheep Manure (1.25-1-2).....	1.08	1.05	2.36
Armour Fertilizer Works Pulverized Sheep Manure (1.5-1-2).....	1.53	1.20	3.36
Atkins & Durbrow, Inc. Driconure (2-1-1).....	3.89	3.50	2.24
Central Chemical Corp. Farmrite Cow Manure (2-1-1).....	2.24	1.16	2.56
Farmrite Sheep Manure (1.5-1-2).....	1.50	1.31	3.70
Consolidated Rendering Co. Corenco Sheep Manure (2-1-2).....	2.13	1.61	2.66
Corenco Spurz-on (3.5-3.5-1.5).....	4.66	4.39	2.38
A. H. Hoffman, Inc. Cow Manure (Dehydrated) (2-1-1).....	2.11	1.89	2.84
Poultry Manure (Dehydrated) (3-1-1.5).....	3.50	3.06	1.90
Sheep Manure (Kiln-Dried) (1.5-1-2).....	1.67	1.31	3.68
International Minerals & Chemical Corp. Sheep Manure (1.25-1-2).....	1.71	1.79	2.10
Norwood Brand Fertilizer Co. Norwood Brand Sheep Manure Screened from Wool (1.5-.35-2.75).....	1.68	.43	4.02
Rogers & Hubbard Co. Gro-Fast Sheep Manure (1.25-1-2).....	1.30	1.43	3.64
Sears, Roebuck & Co. Cross Country Cattle Manure (1.5-.75-2).....	1.90	1.15	2.98
Cross Country Cattle Manure (1.5-1-2).....	1.75	1.41	4.10
Cross Country Sheep Manure (1.5-.75-2).....	2.14	1.22	2.52
Walker-Gorden Laboratory Co. Bovette (2-1-1).....	2.00	1.10	2.80
Bovung (2-1-1).....	2.13	1.61	2.74

AGRICULTURAL LIME PRODUCTS

Explanation of Table of Analyses

"Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "percent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "percent" column by 20.

"Insoluble matter" represents material which is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical analysis" the figures represent the percentage of product that would pass or be retained by the meshed sieves mentioned

Agricultural Lime Products

Name of Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
	<p>Allied Minerals, Inc. Hoosac Agricultural Limestone.....</p>								
	52.2	54.0	.7	.5	52.9	1058	5.1	37.1	none
	51.9	54.0	.4	.5	52.3	1046	6.1	75.0	none
<p>Central Chemical Corporation Farmrite Hydrated Lime.....</p>									
	70.5	72.0	1.0	.75	71.3	1426	4.1	—	—
<p>Conklin Limestone Co., Inc., Canaan, Conn. High Magnesium Agricultural Ground Limestone.....</p>									
	29.2	30.0	18.7	20.0	53.7	1074	11.7	73.2	0.6
<p>A. H. Hoffman, Inc. Hoffman Hydrated Lime.....</p>									
	68.6	70.0	1.6	1.0	70.3	1406	5.6	—	—
<p>Lee Lime Corporation Lee Double Strength Agricultural Hydrated Lime..... Lee Hydrated Lime for General Purposes..... Lee Pulverized Limestone.....</p>									
	44.7	45.0	31.5	30.0	87.1	1742	4.1	—	—
	45.8	45.0	33.6	29.0	89.9	1798	4.0	—	—
	33.5	30.0	19.0	20.0	58.9	1178	3.3	54.8	none
	31.5	30.0	21.0	20.0	59.3	1186	4.1	58.6	0.4
	37.2	35.0	27.2	25.0	72.7	1454	6.3	—	—
	42.3	38.0	9.6	8.0	54.9	1098	6.5	87.1	0.2
<p>New England Lime Co. Nelco Agricultural Hydrated Lime (Adams)..... Nelco Agricultural Hydrated Lime (Canaan, Conn.)..... Nelco Agricultural Limestone (Adams)..... Nelco Agricultural Ground Limestone (Canaan, Conn.)..... Tobey Agra Hydrate..... Tobey Pulverized Limestone Dust.....</p>									
	73.7	70.0	.7	.5	74.9	1498	4.0	—	—
	46.1	47.0	33.6	31.0	89.9	1798	3.1	—	—
	52.9	53.5	.5	.4	53.4	1068	4.1	65.5	3.4
	32.6	30.0	20.5	21.0	60.4	1208	2.6	73.6	0.4
	39.7	35.0	28.6	25.0	77.7	1554	4.5	—	—
<p>United States Gypsum Co. Red Top General Purpose Hydrated Lime (Farmams)..... Red Top Hydrated Agricultural Lime (Farmams)..... USG Agricultural Limestone (Farmams).....</p>									
	72.7	70.0	1.6	trace	74.9	1498	4.0	—	—
	71.1	70.0	1.9	trace	73.5	1470	5.3	—	—
	55.0	50.5	1.0	.25	56.3	1126	4.7	89.1	none
<p>Vermont Associated Lime Industries, Inc. Green Mountain Handy Hydrate.....</p>									
	65.8	60.0	2.9	1.0	69.9	1398	5.6	—	—

**DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE
IN MASSACHUSETTS IN 1950**

- Adco Works, Carlisle, Penn.
 American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St. at St. Clair, Marietta, Ohio
 Apothecaries Hall Co., 28 Benedict St., Waterbury 88, Conn.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2, Minn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
 Associated Seed Growers, Inc., Milford, Conn.
 Atkins & Durlow, Inc., 165 John St., New York 7, N. Y.
 Barrett Division, Allied Chemical & Dye Corporation, 40 Rector St., New York 6, N. Y.
 Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Joseph Breck & Sons Corporation, 401 Summer St., Boston 10, Mass.
 Central Chemical Corp., Lebanon, Penn.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Davey Tree Expert Co., 117 S. Water St., Kent, Ohio
 Davison Chemical Corporation, Charles & Fayette Sts., Baltimore 3, Md.
 Doggett-Pfeil Co., 642 Morris Turnpike, Springfield, N. J.
 Doughnut Seed Co., 151 Twelfth St., Jersey City, N. J.
 E. I. du Pont de Nemours & Co., Wilmington, Del.
 Eastern States Farmers' Exchange, Inc., 26 Central St., West Springfield, Mass.
 Essex County Cooperative Farming Association, Topsfield, Mass.
 Essex Products Co., 581 Boylston St., Boston 16, Mass.
 Excell Laboratories, Inc., 2623 South Indiana Ave., Chicago, Ill.
 Faesy & Besthoff, Inc., 325 Spring St., New York 13, N. Y.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
 Fox Point Chemical Co., 49 Valley St., East Providence, R. I.
 Frank's Market Garden, 1398 Allen St., Springfield, Mass.
 Frost & Higgins Co., 20 Mill St., Arlington 74, Mass.
 Garfield Williamson, Inc., 1072 Westside Ave., Jersey City, N. J.
 Goulard & Olena, Inc., Skillman, N. J.
 C. L. Halvorson Tree Service, 150 North St., Pittsfield, Mass.
 Heeman Manufacturing Co., 515 Palmer St., Wooster, Ohio
 A. H. Hoffman, Inc., Landisville, Penn.
 Horn & Supply Co., Inc., 190 Central St., Leominster, Mass.
 Humphreys-Godwin Co., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., Copley, Ohio
 Hy-Trous Corporation, 3 Green St., Woburn, Mass.
 International Minerals & Chemical Corporation, Woburn, Mass.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 Lexington Gardens, Inc., Lexington, Mass.
 McCormick & Co., Inc., McCormick Bldg., Baltimore 2, Md.
 Miller Chemical & Fertilizer Corporation, 1000 S. Caroline St., Baltimore 31, Md.
 Norwood Brand Fertilizer Co., Mt. Vernon St., North Reading, Mass.
 Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
 F. G. Phillips Co., 255 Cedar St., Dedham, Mass.
 Plantabbs Corporation, 1 West Biddle St., Baltimore 1, Md.
 Premier Peat Moss Corporation, 535 Fifth Ave., New York 17, N. Y.
 Pulverized Manure Co., 503 Exchange Bldg., Chicago 9, Ill.
 Ra-Pid-Gro Corporation, 88 Ossian St., Dansville, N. Y.
 John Readon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 Rose Manufacturing Co., 6 Main St., Beacon, N. Y.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., 8 South Michigan Ave., Chicago 3, Ill.
 Saratoga Laboratories, Inc., National Bank Bldg., Saratoga Springs, N. Y.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck & Co., 925 South Homan Ave., Chicago 7, Ill.
 Sewerage Commission of the City of Milwaukee, Milwaukee I, Wis.
 M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave., & Venango St., Philadelphia 34, Penn.
 Smith Agricultural Chemical Co., 618 North Champion Ave., Columbus 16, Ohio
 Stimuplant Laboratories Co., 791 South Lazzelle St., Columbus, Ohio
 Stockdale Fertilizer Co., Morris, Ill.
 Swift & Company Plant Food Division, 25 Faneuil Hall Sq., Boston 9, Mass.
 Synthetic Nitrogen Products Corp., 285 Madison Ave., New York 17, N. Y.
 Tennessee Corporation, Lockland, Cincinnati 15, Ohio
 Tennessee Corporation, 619 Grant Bldg., Atlanta, Ga.
 I. P. Thomas & Son Co., 721 Market St., Camden, N. J.
 Thomson Phosphate Co., 407 South Dearborn St., Chicago 5, Ill.
 Universal Chemical Co., Lynn, Mass.
 Walker-Gordon Laboratory Co., Plainsboro, N. J.
 C. P. Washburn Co., Middleboro
 Woodruff Fertilizer Works, Inc., Sackett Point Road, North Haven, Conn.
 F. H. Woodruff & Sons, Inc., Milford, Conn.

**DIRECTORY OF MANUFACTURERS WHO REGISTERED AGRICULTURAL LIME
PRODUCTS FOR SALE IN MASSACHUSETTS IN 1950**

Allied Minerals, Inc., West Chelmsford, Mass.

Central Chemical Corporation, Lebanon, Penn.

Conklin Limestone Co., Inc., Sand Road, Canaan, Conn.

Conklin Limestone Co., Inc., Saylesville R.F.D., R. 1.

A. H. Hoffman, Inc., Landisville, Penn.

Kelley Island Lime & Transport Co., 1122 Leader Bldg., Cleveland 14, Ohio

Lee Lime Corporation, Lee, Mass.

Limestone Products Corporation of America, 122 Main St., Newton, N. J.

New England Lime, Adams, Mass.

United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.

Vermont Associated Lime Industries, Inc., Winooski, Vt.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 146

JULY, 1950

**Thirtieth Annual Report of
Pullorum Disease Eradication
in Massachusetts**

BY THE POULTRY DISEASE CONTROL LABORATORY

A total of 579 chicken, turkey, pheasant, and quail flocks was tested during the 1949-50 testing season. The number of samples tested was the largest on record in the test history for Massachusetts (1,444,364 chicken and 30,840 fowl other than chicken). The percentage of reactors (0.06) was slightly higher than that of the previous season. The percentage of breaks (4.82) also was higher. However 98.28 percent of all birds tested were in 100 percent tested, non-reacting flocks.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

THIRTIETH ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1949-50

By the Poultry Disease Control Laboratory¹

INTRODUCTION

During the 1949-50 season more samples were tested than during any previous testing year. The average percentage of reactors was slightly greater than that of the previous year, due largely to two flocks with serious pullorum "breaks." The number of "breaks" (18) for the year also represented an increase over the previous season. Fortunately, all "break" flocks, with the exception of two, revealed less than 0.5 percent reactors. These results might suggest a temporary retardation in pullorum disease eradication; however, when one considers that 98.28 percent of all birds tested were in 100 percent tested flocks, there should be no concern at the present time about the effectiveness of the program.

It may be reported with great satisfaction that the testing operations were carried out with few difficulties, and that most flock owners received the service when they requested it. It is hoped that flock owners will continue to give their fullest cooperation in order that a high quality of service may be rendered the industry.

Appreciation is also expressed for the cooperation and assistance received in this program from the Extension Service, the Massachusetts Department of Agriculture, and other agencies.

SUMMARY OF SERVICE RENDERED

Applications received.....	592
Applications cancelled.....	13
Flocks tested.....	579
Chicken flocks.....	475
Turkey flocks.....	87
Pheasant flocks.....	17
Number of tests.....	1,475,204
Chickens:	
Routine.....	1,381,103
Experimental.....	63,261
Fowl other than chickens:	
Routine.....	30,779
Experimental.....	61
Owners receiving necropsy service.....	74
Necropsies of reacting birds.....	132

DISTRIBUTION OF TESTS AND REACTORS

Table 1 reveals that 1,444,364 samples were received from chicken flocks in 12 counties. The percentage of positive tests was 0.06. Middlesex, Plymouth, and

¹ Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor in charge; K. L. Bullis and G. H. Snoeyenbos, Research Professors; O. S. Flint, Miriam K. Clarke, Assistant Research Professors; O. M. Olesniak, A. M. Crotty, and C. D. Brandt, Research Assistants. Appreciation is extended to Dr. J. B. Lentz, Head of the Department of Veterinary Science, for the assistance given to the testing work.

Worcester Counties led in the number of tests. In one county (Dukes) no reactors were found, and all counties but two had less than 0.05 percent reactors.

The following breeds were tested: Bantam, Barred Plymouth Rock, Brahma, Columbian, Cornish (Black & White), Crosses, Delaware, New Hampshire, Rhode Island Red, White American, White Leghorn, White Plymouth Rock, Wyandottes (Buff, Silver Laced, White).

The Rhode Island Red, New Hampshire, and Barred Plymouth Rock were the predominating breeds. Of the total samples 38.57 percent were taken from Rhode Island Red, 31.12 percent from New Hampshire, 22.23 percent from Barred Plymouth Rock, and the balance from other breeds listed.

Of the 1,312,208 samples collected from females, 55,853 were from hens and 1,256,355 from pullets, with 0.24 and 0.04 percent reactors, respectively. The 132,156 samples collected from males gave 0.10 percent positive tests.

ANNUAL TESTING OF FLOCKS

Table 2 gives the results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years.

In the first year group there were 62 flocks, representing 82,292 tests of which 0.009 were positive. In this group 60 flocks, containing 99.66 percent of the birds, were non-reacting and two flocks were positive. The average number of birds per flock was 1,278.

Table 2.—Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	Partially Tested	100% Tested	Partially Tested	
Tested for the first time.....	62	79,278	82,292	7	0.009	58	2	1	1
Intermittent testing.....	30	42,538	44,606	54	0.12	27	2	1	—
Two consecutive years.....	40	102,803	102,806	128	0.12	36	3	1	—
Three or more consecutive years..	343	1,136,246	1,214,660	613	0.05	333	4	3	3
TOTALS.....	475	1,360,865	1,444,364	802	0.06	454	11	6	4

In the group tested intermittently there were 30 flocks, representing 44,606 tests. In this group 29 flocks, containing 98.08 percent of the birds, were non-reacting and one flock was positive. The average number of birds per flock was 1,417.

In the group tested for two consecutive years there were 40 flocks, representing 102,806 tests. Thirty-nine flocks were non-reacting, representing 99.29 percent of the birds tested in this group. The average number of birds per flock was 2,570.

In the group tested for three or more consecutive years there were 343 flocks, representing 1,214,660 tests. The average percentage of positive tests was 0.05. A total of 337 non-reacting flocks was detected which contained 97.87 percent of the birds tested in this group. Six flocks were positive. The average number of birds per flock was 3,312.

Table 3.—Appearance of Infection in Flocks Previously Negative

Flock	Number of Years Negative	1949-50 Season			Explanation for Infection
		Flock Total	Number Tested	Positive Tests Percent	
1	4	3,042	3,042	0.00	Purchased infected stock
		2,502	2,502*	0.04	
		2,501	1,144*	0.00	
2	3	9,194	9,194	0.01	Questionable stock
		3,449	3,449*	0.00	
		588	588*	0.00	
3	1	2,872	2,872	0.07	Incomplete eradication
		2,702	2,702*	0.04	
		2,499	2,499*	0.00	
		2,499	400*	0.00	
4	4	940	940	0.32	Purchased infected stock
		814	814*	0.00	
5	24	7,402	7,402	0.00	Unknown
		6,585	6,585*	0.08	
		4,741	4,741*	0.00	
6	4	2,932	2,932	0.07	Unknown
		2,573	2,573*	0.00	
7	3	2,936	2,936	0.10	Questionable stock
		945	945*	0.00	
8	1	5,655	5,655	0.04	Incomplete eradication
		4,291	1,791*	0.00	
9	21	2,520	2,520	5.75	Purchased infected stock
		1,933	1,933*	1.76	
		1,838	1,838*	0.44	
		1,734	1,734*	0.06	
		1,678	1,678*	0.00	
		1,602	1,602*	0.00	
		1,426	1,426*	0.07	
10	13	651	651	0.31	Purchased infected stock
		585	585*	0.00	
		556	556*	0.00	
11	8	4,524	4,524	0.04	Questionable stock
12	1	5,770	5,770	0.03	Questionable stock
13	25	3,347	3,347	7.20	Unknown
		2,709	2,709*	2.44	
		2,345	2,345*	0.47	
		2,158	2,158*	0.14	
		1,949	1,949*	0.00	
		1,832	1,832*	0.00	
		1,535	1,535*	0.00	
		1,372	1,372*	0.29	
14	8	964	964	0.31	Contest
		961	87*	0.00	
		874	874*	0.00	
15	3	9,150	9,150	0.09	Unknown
		9,142	1,958*	0.00	
16	5	2,754	2,754	0.04	Inadequate preventive measures
		1,749	1,749*	0.06	
		1,748	209*	0.00	
		1,748	201*	0.00	
17	2	157	157	0.06	Questionable stock
18	21	5,329	5,329	0.02	Unknown
		4,235	4,235*	0.00	
		4,235	877*	0.00	

* Represents retests

For the four groups as a whole 475 flocks were tested, representing 1,360,865 birds and 1,444,364 samples, of which 0.06 percent were positive. The 454 flocks which were 100 percent tested and non-reacting contained 1,337,524 birds or 98.28 percent of the total birds tested. Ten flocks, representing 16,005 birds, were classified as positive. The average percentage of reactors among these birds was 2.77.

Annual testing of flocks is recognized as essential in the control and eradication of pullorum disease. During the past year 85 or 17.53 percent of the flocks tested in 1948-49 were not tested this season. This is a smaller number than dropped out the previous season. In flocks tested one year and not the next, infection is more likely to become established among the birds than in flocks tested annually. Owners of breeding flocks should adopt a program that will be effective in maintaining a pullorum-clean flock.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

During the past year an increase in pullorum "breaks" was observed among the tested flocks. Table 3 shows that reactors were found in 18 flocks which had been negative the previous season. Eleven flocks had been negative for 1 to 5 consecutive years, three flocks for 8 to 13 years, and four flocks for 21 to 25 years. In all but two of the flocks less than 0.5 percent reactors was found on the initial test.

In nine flocks, questionable or infected stock had been introduced for replacement stock; in four flocks, incomplete or inadequate preventive measures were observed; and in five flocks the source of infection was classified as unknown. One of the "break" flocks (No 13) was responsible for the infection in Flocks 1, 4, 9, and 10. A study of the testing results revealed that the infection apparently was introduced into Flock 13 from an unknown source during March or April, some months after the flock had been tested and received a pullorum-clean rating.

Twelve flocks were retested and obtained a negative test. Flocks 9 and 13 were subjected to short-interval retesting. Flock 9 was subjected to seven retests. The birds were tested five times before a negative test was obtained. However, after two consecutive negative tests, one reactor was detected on the seventh test. Flock 13 was tested five times before a negative test was obtained. The entire flock passed three consecutive negative tests during a two and one-half month period. Approximately two months after the date of the last negative test, the flock was tested again and one infected bird was detected in a pen of birds which had passed five consecutive negative tests, the first negative test being obtained five months previously.

These results show that flocks with a relatively high percentage of infection may not respond favorably to an intensive testing program. A more expedient and economical procedure for the eradication of the disease would be to dispose of the infected flock and replace with pullorum-clean stock. However, it is difficult to persuade owners of valuable breeding flocks to adopt such a program.

In the following summary is given the incidence of "breaks" among Massachusetts tested flocks during the past eleven years.

Year	Number of Flocks	Breaks		Flocks with less than 0.5 percent infection on first test	
		Number	Percent	Number	Percent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	50.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94
1948	425	16	3.76	13	81.25
1949	386	6	1.55	3	50.00
1950	373	18	4.82	16	88.88

It is hoped that the incidence of "breaks" can be kept at a very low level if not completely reduced to zero. All flock owners (including those not in the testing program) and hatcherymen should exercise every possible precaution against the spread and introduction of infection.

The following measures have been found to be effective for establishing and maintaining a pullorum-free flock.

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the report.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. Provide an empty pen to each house to facilitate cleaning and disinfection during the winter months. Use disinfectants approved by the United States Department of Agriculture.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are re-admitted into the flock.
7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. Consult the Massachusetts Department of Agriculture, 41 Tremont Street, Boston, regarding additions or replacements in your flock.
8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.
9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.
10. Poultrymen should not custom-hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum disease-free flocks should not have hatching done where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING OF FOWL OTHER THAN CHICKENS

During the past year 30,840 samples from fowl other than chickens were tested including 23,154 turkey, 5,983 pheasant, 1,317 quail, 219 geese, 140 duck 2 partridge, and 25 guinea fowl. Only the turkeys revealed reactors (0.06 percent). Among the 87 turkey flocks tested only 10 had more than 500 birds per flock.

Persons raising turkeys are cautioned to maintain constant vigilance against the introduction of pullorum disease.

NON-REACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4 non-reacting and positive flocks are listed by counties. In 12 counties, 465 non-reacting flocks, representing 1,344,860 birds, were identified. Of

Table 4—Non-reacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Totals	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Non-reacting Flocks						
Barnstable.....	5	45,715	—	—	5	45,715
Berkshire.....	8	35,583	1	761	9	36,344
Bristol.....	65	163,992	—	—	65	163,992
Dukes.....	2	4,648	—	—	2	4,648
Essex.....	62	165,987	1	439	63	166,426
Franklin.....	21	43,376	—	—	21	43,376
Hampden.....	18	25,895	1	235	19	26,130
Hampshire.....	26	49,637	1	295	27	49,932
Middlesex.....	79	234,414	2	1,499	81	235,913
Norfolk.....	41	145,891	—	—	41	145,891
Plymouth.....	61	218,572	2	2,563	63	221,135
Worcester.....	66	203,814	3	1,544	69	205,358
TOTALS	454	1,337,524	11	7,336	465	1,344,860
Positive Flocks						
Berkshire.....	—	—	1	5,770	1	5,770
Bristol.....	—	—	1	312	1	312
Essex.....	1	734	—	—	1	734
Hampden.....	1	251	—	—	1	251
Hampshire.....	1	2,520	1	900	2	3,420
Middlesex.....	1	815	1	22	2	837
Norfolk.....	1	157	—	—	1	157
Plymouth.....	1	4,524	—	—	1	4,524
TOTALS...	6	9,001	4	7,004	10	16,005

these, 454 were 100 percent tested, representing 1,337,524 birds; whereas 11 were partially tested and contained 7,336 birds. The non-reacting flocks identified in Barnstable, Bristol, Dukes, Franklin, and Norfolk counties were 100 percent tested.

At the close of the season, 10 flocks, representing 16,005 birds, were classified as infected—4 flocks more than the previous year. Of the infected flocks, 6 were 100 percent tested and 4 partially tested.

While the number of positive flocks is small, it should be recognized that pullorum infection still exists in Massachusetts and that these infected flocks may serve as foci of infection for other flocks if proper measures are not taken. Owners of infected flocks should make every effort to eradicate the disease from the premises without delay.

COMPARISON OF 1948-49 AND 1949-50 TESTING

Table 5 shows an increase in number of tested flocks in seven counties, a decrease in three counties, and no change in two. All counties showed an increase in the number of birds tested. Dukes was the only county in which no reactors were detected; whereas last year there were five counties in which no infection was found.

It is apparent that the general picture of pullorum disease testing does not vary much from year to year. However, slight reverses in trends this past year should not be overlooked, and every possible effort should be made to reduce the number of infected flocks in the State.

Table 5.—Comparison of the 1948-49 and 1949-50 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1948-49 Season					
Barnstable.....	4	24,630	24,630	0.00	4
Berkshire.....	9	40,437	42,730	0.04	9
Bristol.....	64	139,912	141,779	0.004	62
Dukes.....	1	3,902	3,902	0.00	1
Essex.....	55	141,854	146,122	0.04	52
Franklin.....	25	37,840	38,014	0.00	25
Hampden.....	14	18,523	18,627	0.02	14
Hampshire.....	26	40,252	40,222	0.00	26
Middlesex.....	83	218,951	233,255	0.14	82
Norfolk.....	43	133,618	134,820	0.002	43
Plymouth.....	64	200,555	200,582	0.00	64
Worcester.....	70	179,007	188,360	0.02	70
TOTALS.....	458	1,179,481	1,213,073	0.04	452
1949-50 Season					
Barnstable.....	5	45,715	45,715	0.002	5
Berkshire.....	10	42,114	42,114	0.005	9
Bristol.....	66	164,304	171,897	0.04	65
Dukes.....	2	4,648	4,648	0.00	2
Essex.....	64	167,160	171,333	0.07	63
Franklin.....	21	43,376	55,846	0.01	21
Hampden.....	20	26,381	26,381	0.02	19
Hampshire.....	29	53,352	82,248	0.62	27
Middlesex.....	83	236,750	250,292	0.03	81
Norfolk.....	42	146,048	151,689	0.0006	41
Plymouth.....	64	225,659	232,368	0.002	63
Worcester.....	69	205,358	209,833	0.004	69
TOTALS.....	475	1,360,865	1,444,364	0.06	465

THIRTY-YEAR TESTING SUMMARY

Table 6 shows that a larger number of birds was tested this past year than in any previous season. The general trend of progress for 1949-50 was about the same as in the more recent years.

Table 6.—Thirty-Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19
1947-48	494	1,219,957	1,272,547	0.10	476	1,185,852	97.20
1948-49	458	1,179,481	1,213,073	0.04	452	1,171,363	99.31
1949-50	475	1,360,865	1,444,364	0.06	465	1,344,860	98.82

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: In this report the importance of annual testing of all birds on the premises has been stressed repeatedly. It was stated that 18.43 percent of the flocks tested in 1948-49 were not tested in 1949-50. The number of flocks that drop out each year far exceeds the number of flocks which re-enter the program with an intermittent testing history. The flocks which are in the program for just one year do not contribute to the goal of eradication as much as flocks tested annually.

For a sound control and eradication program, annual testing of flocks is essential, but other measures must also be observed. The testing of all birds on the premises will not prevent re-infection of a flock. Flock owners should give more consideration to the problem of "breaks" and how it may influence the program in the future. The question may be raised—will our flock owners be testing their flocks thirty years from now on much the same basis as at present? Have all the possibilities been explored fully which might bring about a program that would eliminate partially or completely the testing of flocks? This would mean a saving of funds which could well be employed for investigation and control of other important poultry diseases.

Early Testing: For a number of years early testing has been encouraged in order that the laboratory might be in a better position to meet the demand for testing in the fall and winter months. The laboratory is very appreciative of the cooperation received from the different flock owners in meeting this situation. The following summary gives the volume of tests by months.

Months	Number of Tests
April, 1949	9,001
May.....	73,393
June.....	72,394
July.....	98,616
August.....	147,305
September.....	171,469
October.....	210,753
November.....	224,502
December.....	174,918
January, 1950.....	172,000
February.....	62,245
March.....	55,438
April.....	3,170
Total.....	1,475,204

Approximately 783,000 tests were completed by November 1 this past year. It may be noted that the peak of the testing volume has been leveled off and spread over six months. The distribution of the testing volume over more months during the year is in part due to the regulation that all birds over five months of age must be tested before they can be used for the production of hatching eggs. As pullet flocks come into production they should not be used for breeders unless they are tested and found non-reacting.

Application cards for the 1950-51 season were sent out in April to all flock owners who had birds tested this past season. All applications should be filed early so that the laboratory can determine what may be needed for equipment, supplies, and personnel. Furthermore, if the demand for testing exceeds what can be accomplished with funds allotted for this work, it should be discovered as soon as possible so that steps may be taken to meet the situation.

Application cards will be serviced in order of receipt unless circumstances suggest otherwise. Applications for testing can be more efficiently serviced if flock owners will file them early and submit adequate money to cover the testing of the flock. Too frequently flock owners ask for service on short notice, placing an additional burden on the laboratory. The payment for testing should be sent to the Treasurer of the University of Massachusetts.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 147

NOVEMBER 1950

Seed Inspection

BY SEED CONTROL SERVICE STAFF

This report, the twenty-third in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1950 by authority of Chapter 94 as amended by Chapter 377 of the Acts of 1946.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The following regulations and fees have been approved by the Director of the Massachusetts Agricultural Experiment Station.

FIELD CROPS:	KIND OF SEED	PURITY ONLY	GERMINATION ONLY	PURITY AND GERMINATION
Alfalfa, Rape, Ryegrasses, Soybeans, Timothy.....		\$1.00	\$0.50	\$1.25
Cereals, Buckwheat, Sudan Grass, Vetches.....		1.25	.50	1.50
Clovers, Fescues, Reed Canary Grass.....		1.00	.50	1.50
Brome Grass, Millets.....		1.50	.50	2.00
Bentgrasses, Bluegrasses, Orchard Grass, Redtop....		2.00	.50	2.25
Redtop (Unhulled).....		2.50	.50	2.75

Mixtures: Lawn, Pasture, Mowing, etc.

Purity only..... \$2.50

Germination only..... .50 for each component

Purity and Germination..... 2.50 ± .50 for each component

Special Mixtures: Consisting of two kinds of cereals, two kinds of clover only, or Timothy and one kind of clover

Purity only..... \$1.25

Germination only..... .50 each

Purity and Germination..... 2.00

Vegetables: Germination tests for all kinds of vegetable seeds, 30 cents each.

Cleaning Tobacco Seed: For each lot of one pound or less, based on the weight of seed as received for cleaning, 50 cents.

Kinds of Seed Not Listed: Fees for testing and for other seed determinations not listed will be based on the time consumed in making the test or for other service requested.

Free Tests: During any one calendar year, the Seed Testing Laboratory will allow two free tests of vegetable or tobacco seed to any person residing or doing business in the Commonwealth.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any kind to be submitted for a germination test is 400.

Samples should be taken so as to correctly represent the lot sampled, each placed in a strong container, the parcel of samples securely wrapped and addressed to Seed Laboratory, Agricultural Experiment Station, Amherst, Mass.

Checks or Money Orders must be made payable to the University of Massachusetts and sent to the Seed Laboratory.

In no case will the final report for work done be rendered until all fees are paid.

SEED INSPECTION FOR THE SEASON OF 1950

By Seed Control Service Staff:

F. A. McLaughlin, *Associate Research Professor in Charge*

Jessie L. Anderson, *Research Instructor*

Waldo C. Lincoln, Jr., *Laboratory Assistant*

Stanley M. Spencer, *Laboratory Assistant*

Mrs. Phyllis Russell, *Laboratory Assistant*

May J. Honnay, *Clerk*

Mrs. Mabel Martell, *Junior Clerk*

*A. Warren Clapp, *State Inspector*

Massachusetts Vegetable Seed Standards for 1951

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>).....	60	Kale.....	75
Asparagus.....	*70	Kohlrabi.....	75
Bean, Lima.....	70	Leek.....	60
Bean, Scarlet Runner.....	75	Lettuce.....	80
Bean, Other Varieties.....	75	Muskmelon.....	75
Beet.....	65	Mustard.....	75
Broccoli.....	75	Okra.....	*50
Brussels Sprouts.....	70	Onion.....	70
Cabbage.....	75	Parsley.....	60
Cabbage, Chinese.....	75	Parsnip.....	60
Carrot.....	55	Peas.....	80
Cauliflower.....	75	Pepper.....	55
Celeriac.....	55	Pumpkin.....	75
Celery.....	55	Radish.....	75
Chard, Swiss.....	65	Rhubarb.....	60
Chicory.....	65	Rutabaga.....	75
Citron.....	65	Salsify.....	75
Collard.....	80	Sorrel.....	60
Corn, Sweet.....	75	Soybean.....	75
Cress, Garden or Curled.....	40	Spinach, Common.....	60
Cress, Water.....	35	Spinach, New Zealand.....	40
Cucumber.....	80	Squash.....	75
Dandelion.....	45	Tomato.....	75
Egg Plant.....	60	Tomato, Husk.....	50
Endive.....	70	Turnip.....	80
Fetticus (Corn Salad).....	70	Watermelon.....	70

*Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds and the percentage of hard seed, if present, must be stated.

*Employed by the State Department of Agriculture.

1950 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1949, to November 1, 1950, the Seed Laboratory received 6024 samples of seed, of which 1006 were collected by the State Department of Agriculture and 5018 were sent in by seedsmen, farmers and various state institutions. An additional lot of 270 samples of flower seeds, for field tests only, was received from the State Commissioner of Agriculture.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 6024 samples was 368 for purity and 6620 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
265 Field Crops for Purity and Germination.....	265	265
471 Field Crops for Germination Only.....	.....	471
50 Lawn Mixtures for Germination Only; Germinations involving 263 ingredients.....	.....	263
85 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 486 ingredients	85	486
18 Lawn Mixtures for Purity Only.....	18	.....
4986 Vegetables for Germination Only.....	.....	4986
14 Tree Seeds for Germination Only.....	.....	14
108 Tobacco Seeds for Germination Only.....	.....	108
27 Flower Seeds for Germination Only.....	.....	27
<hr/> 6024	<hr/> 368	<hr/> 6620

Field tests to determine trueness to type were conducted under the supervision of the Departments of Olericulture and Floriculture, which tested 317 samples of vegetable seeds and 270 samples of flower seeds, respectively.

The Seed Laboratory cleaned 78 lots of tobacco seed for Connecticut Valley farmers. The gross weight of the tobacco seed was 72.50 pounds, and the net weight for the cleaned seed was 60.88 pounds.

Explanation of Tables

Tables 1 - 3 contain seeds, the sale of which is regulated by Chapter 94 as amended by Chapter 377 of the Acts of 1946: Table 1, Agricultural Seeds as defined under Section 261 B1; Table 2, Mixtures of Agricultural Seeds as defined under Section 261 B1; and Table 3, Vegetable Seeds only, under provisions of Section 261 B2 and 261 C.

All samples were taken by an inspector from the State Department of Agriculture and were tested at the Seed Laboratory according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

Within each table the wholesalers are listed in alphabetical order and the various kinds of seeds sold by them follow the same alphabetical arrangement. Mislabeling and other irregularities are emphasized by boldface type and explained in the final column of the table. The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F" what was found in the laboratory analysis.

Table 4 is a summary, by wholesalers, of the total number of samples tested, showing how many were correctly labeled and how many were mislabeled.

Table 1.—Results of Inspection and Analyses of Field Seeds—Sections 261 B1 and 261 C.

Each lot of Agricultural Seeds must be labeled to show the commonly accepted name and variety, except that for Barley, Buckwheat, Oats, Rye and Wheat, when the variety is unknown the label shall bear the statement: "Variety Unknown." The label must also show lot number or other identification; percentage, by weight, of pure seed; percentage, by weight, of inert matter; percentage, by weight, of weed seeds; percentage, by weight, of other agricultural seeds; percentage of (a) germination, exclusive of hard seeds, (b) hard seeds, if present; month and year germination test was completed; origin of Alfalfa, Red Clover and Field Corn (other than Hybrid), except if origin is unknown, it must be so stated; name and address of the person who labeled the seed, or who sells, offers or exposes such seed for sale and the names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams and 1 in 10 grams of the smaller seeds, and per pound when present in excess of 1 in 25 grams and 1 in 100 grams of the larger seeds. Secondary noxious weeds are dodder (*Cuscuta spp.*), horse nettle (*Solanum carolinense*), wild mustards (*Brassica spp.*), wild garlic and wild onion (*Allium spp.*), perennial sow thistle (*Sonchus arvensis*), corncockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*). Seed is prohibited from sale for having a false or misleading label; unless the test for germination has been completed within a nine months period or if it contains primary noxious weed seeds in excess of tolerance. Primary noxious weeds are Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and quack grass (*Agropyron repens*).

Two hundred and ten samples of field crop seeds were analyzed in the laboratory. Results of analysis, however, are given only for samples which were mislabeled. In this table complete analysis is recorded; but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
S-332	Fescue	Belt Seed Co., Baltimore, Md. Worcester State Hospital, Worcester Chewings, No. 2841.....	L 98.79	0.05	1.01	0.15	90.00	1/1950	Germination below that stated.
			F 98.86	0.00	0.88	0.26	78.00	5/1950	
1194	Bluegrass	Joseph Breck & Sons, Boston, Mass. Kentucky, No. 34-43.....	L 98.16	0.17	1.67	0.00	80.00	11/1949	Purity below that stated. Inert Matter excessive.
			F 96.41	0.39	3.15	0.05	86.00	6/1950	

894	Clover	Arthur R. Cone, Inc., Buffalo, N. Y. General Mills, Inc., Farm Service Div., Attleboro Medium Red, No. 15-834..... Origin—Canada	L 99.30 F 99.68	0.10 0.12	0.25 0.05	0.35 0.15	84-6 88-1	1/1950 5/1950	Not Canadian as labeled, but a mixture of Canadian and United States Seed.
1173	Clover	General Mills, Inc., Farm Service Div., Chelmsford Alsike, No. 25-538.....	L 98.00 F 96.14	0.33 0.14	0.60 2.68	1.07 1.04	80-11 70-20	4/1950 6/1950	Purity below that stated. Inert Matter excessive. Germination below that stated.
1174	Clover	Alsike, No. 25-544.....	L 98.76 F 98.52	0.04 0.12	0.40 0.53	0.80 0.83	90.00 75-17	4/1950 6/1950	Germination below that stated.
1178	Trefoil	Birdsfoot, No. 42-42.....	L 97.92 F 98.02	0.42 0.45	0.56 0.37	1.10 1.16	55-34 59-15	3/1950 6/1950	Noxious Weeds excessive—46 Buckhorn Plantain and 1 Brassica sp. per oz. found.
1172	Clover	Medium Red, No. 15-865..... Origin—Canada	L 99.28 F 99.04	0.19 0.13	0.08 0.34	0.45 0.49	88-5 85-4	4/1950 6/1950	Noxious Weeds excessive — 30 Buckhorn Plantain and 1 Canada thistle per oz. found.
221	Alfalfa	General Mills, Inc., Farm Service Div., Middleboro Griam, No. 28-481..... Origin—Canada	L 98.72 F 98.01	0.64 0.80	0.18 0.18	0.46 1.01	76-14 74-8	1/1950 3/1950	Other Crop Seed excessive.
218	Clover	Medium Red, No. 15-834..... Origin—Canada	L 99.30 F 99.44	0.10 0.22	0.25 0.08	0.35 0.26	84-6 82-4	1/1950 4/1950	Not Canadian as labeled, but a mixture of Canadian and United States Seed.
380	Clover	Worcester Grain & Coal Co., Worcester Medium Red, No. 15-834..... Origin—Canada	L 99.30 F 99.47	0.10 0.20	0.25 0.05	0.35 0.28	84-6 84-4	1/1950 4/1950	Not Canadian as labeled, but a mixture of Canadian and United States Seed.
536	Seed Oats	Charles M. Cox Co., Boston, Mass. Wirthmote Grain & Fuel Co., Bridgewater Wirthmote Brand, Variety Unknown.....	L 98.80 F 98.30	0.10 0.60	0.20 0.31	0.90 0.79	97.00 94.00	1/1950 4/1950	Weed Seed excessive.
895	Seed Oats	General Mills, Farm Service Div., Fitchburg, Mass. General Mills, Farm Service Div., Attleboro **Victory Strain, No. 50-1.....	L 98.20 F 98.62	0.18 0.02	0.48 0.39	1.06 0.97	90.00 91.00	3/1950 4/1950	**Variety required unless there is a statement "Variety Unknown." *Strain not acceptable.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1132	Clover	Wm. G. Scarlett & Co., Baltimore, Md. Frank Howard, Inc., Pittsfield Red, No. 8878..... Origin—Oregon	L 99.30 F 98.94	0.20 0.18	0.50 0.47	0.00 0.41	80-10 68-19	1/1950 6/1950	Noxious Weeds excessive — 25 Buckhorn Plantain per oz. found. Germination below that stated.
S-580	Clover	Northampton State Hospital, Northampton Red, No. 8878..... Origin—Oregon	L 99.50 F 99.21	0.40 0.31	0.10 0.29	0.00 0.19	80-10 67-28	1/1950 4/1950	Germination below that stated.
S-175	Bluegrass	State Farm, Bridgewater Kentucky, No. 8831— Origin—Kentucky	L 85.00 F 86.78	0.50 0.77	14.50 12.45	0.00 0.00	80.00 60.00	10/1949 3/1950	Germination below that stated.
S-276	Bromegrass	State Reformatory, West Concord No. 7892..... Origin—No. Dakota	L 90.00 F 85.41	0.30 0.11	9.30 14.33	0.40 0.15	90.00 90.00	11/1949 3/1950	Purity below that stated. Inert Matter excessive.
1051	Bluegrass	C. H. Symmes & Co., Winchester Canada, No. 9121.....	L 90.00 F 77.35	0.40 0.09	6.40 17.33	3.60 5.23	80.00 81.00	4/1950 6/1950	Purity below that stated. Inert Matter excessive. Other Crop Seed excessive.
S-338	Reed Canary Grass	Worcester State Hospital, Worcester No. 8273.....	L 99.00 F 97.85	0.20 0.62	0.70 1.53	0.10 0.00	80.00 65.00	12/1949 4/1950	Purity below that stated. Weed Seeds excessive. Inert Matter excessive. Germination below that stated.
266	Bromegrass	Stanford Seed Co., Buffalo, N. Y. B. W. Brown Grain Co., Concord No. 2367.....	L 85.90 F 82.43	0.70 0.00	13.10 17.57	0.30 0.00	86.00 85.00	11/1949 4/1950	Purity below that stated. Inert Matter excessive.

269	Redtop	No. 2308.....	L 93.17 F 90.04	0.42 0.56	6.41 9.31	0.00 0.09	90.00 88.00	12/1949 4/1950	Purity below that stated. Inert Matter excessive.
1096	Redtop	C. J. Howland, North Brookfield No. 2308.....	L 93.17 F 90.23	0.42 0.57	6.41 9.08	0.00 0.12	90.00 86.00	12/1949 6/1950	Purity below that stated. Inert Matter excessive.
197	Redtop	Whitney Seed Co., Buffalo, N. Y., W. K. Gilmore & Sons, Inc., Medfield No. 40499.....	L 93.28 F 87.43	0.22 0.31	5.97 10.49	0.53 1.77	90.00 90.00	1/1950 4/1950	Purity below that stated. Inert Matter excessive. Other Crop Seed excessive.

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Sections 261B1 and 261C.

Each mixture of Agricultural Seeds shall be labeled to show the commonly accepted name and variety of each agricultural seed component in excess of five percent of the whole and the percentage, by weight, of each in the order of its predominance. The word "mixture" or the word "mixed" shall be shown conspicuously on the label. Other label requirements for Mixtures are the same as those for Field Seeds; hence are not repeated here since they will be found under Table 1.

Forty-two Mixtures were received, but only nine were found to vary sufficiently from the label requirements to justify the statement of complete analysis in this table. Items which are mislabeled, also the name and address of the wholesaler, are printed in boldface type.

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks	
		Label	Found								
1004	W. Allee Burpee Co., Philadelphia, Pa. Herman F. Davis, Merrimac Permagreen Lawn Mixture, No. 6152.			L	93.89	0.28	6.48	0.09	11/1949		
				F		0.40	5.66	0.05	5/1950		
		Components:									
		Domestic Ryegrass.....	32.65	33.64	90.00	95.00					Percentage below that stated.
		Kentucky Bluegrass.....	29.25	20.13	85.00	89.00					Percentage below that stated.
		Chewings Fescue.....	14.76	9.61	88.00	91.00					Percentage exceeds that stated.
		Timothy.....	9.95	15.27	90.00	90.00					Percentage exceeds that stated.
		Redtop.....	4.59	13.27	85.00	90.00					
		White Dutch Clover.....	1.95	1.97	90-4	81-4					
1221	Arthur R. Cone, Inc., Buffalo, N. Y. City Grain Co., Marlboro City Grain Mixture, No. 38 x 304.			L	94.09	0.20	4.50	1.68	5/1950		
				F		0.21	5.48	0.22	6/1950		
		Components:									
	Perennial Ryegrass.....	41.38	40.10	90.00	93.00					Germination below that stated.	
	Kentucky Bluegrass.....	20.41	21.73	80.00	42.00						
	Chewings Fescue.....	15.68	15.10	90.00	90.00						
	Redtop.....	7.60	.....	90.00	.....					

"Bent Grass" not sufficient—
Mixed Bent found.
Germination below that stated.

Bent Grass.....	5.15	90.00				
White Clover.....	3.40	68-22	80-13		1/1950	
Agrostis spp.....		14.10	62.00		4/1950	
(Redtop and Mixed Bent)						
General Mills, Inc., Farm Service Div., Middleboro Anchor Lawn Seed, No. 38 x 218.....				L 89.26		
Components:				F 0.60	8.22	0.90
Kentucky Bluegrass.....	24.00	23.49	75.00	0.82	9.34	0.58
Domestic Ryegrass.....	21.78	21.63	94.00			
Redtop.....	16.20	16.96	85.00			
Meadow Fescue.....	13.50	13.25	80.00			
Timothy.....	9.80	10.35	80.00			
White Clover.....	5.00	3.58	65-25			
			77-19			

Germination below that stated.

Germination below that stated.

Skibiski Farm Supply, Inc., So. Deerfield
Lawn Seed Mixture, No. 38 x 227.....

Components:				L 88.89		
Kentucky Bluegrass.....	36.00	38.05	75.00	0.45	9.59	0.35
Clewis Fescue.....	19.60	19.00	90.00	0.22	10.47	0.42
Domestic Ryegrass.....	18.81	17.74	90.00			
Redtop.....	9.20		90.00			
Colonial Bent Grass.....	5.00		90.00			
White Clover.....	1.00	0.89	90-1			
Agrostis spp.....			70-20			
(Redtop and Colonial Bent)			94.00			

Germination below that stated.

Worcester Grain & Coal Co., Worcester
Lawn Seed Mixture P I, No. 38 x 222.....

Components:				L 90.12		
Redtop.....	34.96		90.00	0.45	8.44	0.40
Kentucky Bluegrass.....	34.00	30.87	75.00	0.21	9.32	0.35
Domestic Ryegrass.....	14.85	14.43	90.00			
Creeping Red Fescue.....	4.90	5.79	90.00			
Astoria Bentgrass.....	2.00		90.00			
Agrostis spp.....			90.00			
(Redtop and Astoria ₁ Bent)			39.03			

Germination below that stated.

222

558

382

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks		
		Label	Found								
1043	Doughten Seed Co., Jersey City, N. J. Atlas Paint & Supply Co., Needham Special Island Green, No. 1950.			L	0.90	16.90	0.90	4/1950	Inert Matter excessive.		
				F	0.81	22.63	0.47	5/1950			
		Components:									
		Common Ryegrass	64.50	69.58	90.00	94.00					Percentage below that stated.
		Timothy	9.00	3.62	80.00	74.00					Percentage below that stated.
402	Lee Patten Seed Co., Jersey City, N. J. Karlson Co., Worcester Beauty Lawn Mixture, No. PMA 218 B 50.			L	0.43	8.98	0.59	2/1950	Inert Matter excessive.		
				F	0.32	15.06	0.26	4/1950			
		Components:									
		Kentucky Bluegrass	51.50	46.23	80.00	86.00					"Bluegrass" not sufficient —
		Perennial Ryegrass	19.75	21.64	90.00	89.00					Percentage below that stated.
1082	Waters & Brown Co., Salem Special Lawn Seed for North Shore Soils, No. 6550 PMA 218.			L	0.42	7.79	0.39	2/1950	Inert Matter excessive.		
				F	0.20	13.32	0.99	6/1950			
		Components:									
		Redtop	41.40	25.51	90.00	82.00					Percentage below that stated.
		Kentucky Bluegrass	25.50	11.76	90.00	92.00					Percentage below that stated.

Fred S. Radway Seed Farm, Nanuet, N. Y.

Colonial Hardware Co., Stoughton

Special Seed Mixture, No. Se L 545

	L	F	82.03	0.95	16.80	0.25	3/1950	5/1950	Components not listed in order of predominance.
Components:									
Kentucky Bluegrass	1.00	2.64	80.00	0.00					Germination below that stated.
Redtop	2.00	80.00	80.00	80.00					Stated but not found.
Timothy	2.00	70.00	70.00	70.00					Stated but not found.
Ryegrass Perennial	77.00	79.39	90.00	92.00					

**Table 3—Results of Inspection and Germination of Vegetable Seeds
Sections 261 B2 and 261 C.**

Each separate container of Vegetable Seeds must be labeled to plainly show the kind of seed and variety and the name and address of the person who labeled such seed or who sells, offers or exposes it for sale. For seeds which germinate less than the Massachusetts Standard the label must also show the percentage of germination exclusive of hard seeds, percentage of hard seeds if present, calendar month and year the test was completed and the words "Below Standard" in not less than 8-point type. Date of test shall not be over nine months old, exclusive of the month in which the test was completed. Seed may not be sold or offered for sale which has a false or misleading label.

Seven hundred and fifty-four samples of vegetable seeds were received and tested in the laboratory; however, this table includes only such samples as were found to be mislabeled with respect to requirements of law.

The wholesaler's name, in all instances, and the germination for those samples of seed found below standard in germination are in boldface type. In samples for which the found germination is not in boldface, the germination is above standard but below germination stated.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
		W. Allee Burpee Co., Philadelphia, Pa. East Longmeadow Grain Store, East Longmeadow					
836	Parsnip	Guernsey, No. 725.....	70	12/1949	42	5/1950	60
		Harding Street Grain Store, Worcester White Portugal, No. 697.....	75	1/1950	37	4/1950	70
958 F	Beet	Quality Hardware Co., Haverhill Improved Blood, No. 128.....	75	1/1950	48	6/1950	65
1160	Celery	R. W. Shattuck & Co., Arlington White Plume.....	70	12/1949	48	6/1950	55
983	Lettuce	The Clapper Co., West Newton, Mass. Romaine or Cos.....	80	1/1950	70	5/1950	80
		Arthur R. Cone, Inc., Buffalo, N. Y. Medfield State Hospital, Medfield Golden Acre, No. 35.....	90	1/1950	81	3/1950	75
S-279 F	Cabbage	State Reformatory, West Concord Golden Acre, No. 40.....	90	1/1950	78	3/1950	75
471 F	Cabbage	Thomas J. Grey Co., Weymouth, Mass. Red Dutch or Mammoth Red.....	—	—	55	4/1950	75
		Charles C. Hart Seed Co., Wethersfield, Conn. Eastman's Hardware Co., Falmouth White Globe.....	70	1/1950	35	6/1950	70
573 F	Cabbage	Federal Supply Co., Northampton Danish Ball Head Short Stem, No. 230.....	92	1/1950	84	4/1950	75
1263	Lettuce	The Hardware Shop, Adams Romaine or White Cos.....	80	1/1950	47	6/1950	80
167 F	Beans	C. V. Hayes, Bridgewater Top Notch Golden Wax, No. 3138 .	85	1/1950	73	3/1950	75
15	Cabbage	Pierce Hardware Co., Taunton Copenhagen Market, No. 235.....	90	10/1949	81	3/1950	75
17	Lettuce	New York Head No. 12, No. 3071..	90	11/1949	78	3/1950	80
18	Lettuce	Big Boston Head, No. 789.....	89	11/1949	69	3/1950	80
22	Lettuce	Romaine, No. 627.....	89	11/1949	15	3/1950	80
893	Lettuce	Romaine or White Cos.....	80	1/1950	44	4/1950	80

Table 3—Results of Inspection and Germination of Vegetable Seeds—Concluded.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
878	Onion	Plymouth Rock Hardware Co., Plymouth Large Red Wethersfield.....	70	1/1950	57	4, 1950	70
206 F	Broccoli	Saunders Hardware & Paint Co., Middleboro Italian Green Heading Calabrese...	75	1/1950	65	3/1950	75
1214	Lettuce	Sharon Hardware Co., Sharon Romaine or White Cos.....	80	1/1950	42	6/1950	80
Budd D. Hawkins, Reading, Vt.							
994	Cabbage	Herman F. Davis, Merrimac Budd's Genuine Surehead.....	75	12/1949	63	5, 1950	75
995	Cabbage	Fotler's Improved Brunswick.....	75	12/1949	61	5, 1950	75
1002	Lettuce	Giant Rapids Forcing.....	80	12/1949	46	5, 1950	80
1216	Dandelion	Arthur C. Lamson, Inc., Marlboro Improved Thick Leaved.....	55	12, 1949	33	6, 1950	45
Merrimac Valley Nurseries, Haverhill, Mass.							
963 F	Cabbage	Golden Acre.....	80	2/1950	52	5, 1950	75
964 F	Cabbage	Marion Market.....	—	—	51	5, 1950	75
962	Lettuce	N. Y. No. 847 or Imperial.....	App. 85	1/1950	18	5/1950	80
965	Onion	Woodruff's Ea. Yellow Globe, No. 9-012 C.....	90	10/1949	61	5/1950	70
Michael-Leonard Seed Co., Chicago, Ill.							
816 F	Turnip	Hamilton & Atwater, Westfield Yellow Globe, No. 82001.....	—	12/1949	46	5/1950	80
The Page Seed Co., Greene, N. Y.							
1252	Onion	Gatzke Hardware Co., Webster Yellow Globe Danvers.....	70	1, 1950	46	6/1950	70
Perry Seed Co., Boston, Mass.							
S-131	Tomato	Taunton State Hospital, Taunton Bonny Best, No. 6914.....	80	1/1950	65	3, 1950	75
Joseph Sordillo & Sons, Boston, Mass.							
488	Onion	Red Flat.....	—	—	20	4/1950	70
485	Pepper	Hot.....	—	—	42	4/1950	55
F. H. Woodruff & Sons, Milford, Conn.							
1134	Lettuce	Burlingame & Darbys, Inc., No. Adams White Seed Simpson, No. 31807 C... App. 90	90	10/1949	1	5/1950	80
162	Lettuce	J. H. Fairbanks Co., Bridgewater White Seed Simpson, No. 31807 C... App. 90	90	10/1949	1	3/1950	80
79	Beans	Waldron Hardware Co., Taunton Top Notch Golden Wax, No. 1107C	76-7	10, 1949	60-9	3/1950	75
S. D. Woodruff & Sons, Orange, Conn.							
1236	Lettuce	Central Paint & Supply Co., Hyde Park Romaine or Cos.....	80	1/1950	40	6/1950	80
S-274	Spinach	State Reformatory, West Concord Bloomsdale Long Standing, No. 74351.....	81	—	63	4/1950	60
S-69	Spinach	Taunton State Hospital, Taunton Nobel Giant Leaved, No. 3180.....	80	12/1949	58	3/1950	60
S-334		Worcester State Hospital, Worcester Nobel Giant Leaved, No. 3180.....	80	12/1949	55	3/1950	60

Table 4—Summary of Inspection

This table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Associated Seed Growers, Inc. New Haven, Conn.	52	52	0				1	1	0
Belt Seed Co. Baltimore, Md.				1	0	1	2	2	0
Boston Market Gardener's Assoc. Boston, Mass.	5	5	0						
Breck, Joseph, & Sons Boston, Mass.	31	31	0	13	12	1			
Burpee, W. Atlee, Co. Philadelphia, Pa.	51	47	4				1	0	1
The Clapper Co. West Newton, Mass.	6	5	1						
The Clark Co. Greenfield, Mass.	5	5	0						
Comstock, Ferre & Co. Wethersfield, Conn.	49	49	0	1	1	0	1	1	0
Community Feed Store East Longmeadow, Mass.							1	1	0
Cone, Arthur R. Buffalo, N. Y.	18	16	2	52	44	8	4	0	4
Cox, Charles M., Co. Boston, Mass.				2	1	1			
Craver Dickinson Co. Buffalo, N. Y.				8	8	0			
Crosman Seed Corp. Rochester, N. Y.	20	20	0						
Dickinson, Albert, Co. Chicago, Ill.				6	6	0	1	1	0
Doughten Seed Co. Jersey City, N. J.							1	0	1
Dreer, Henry A., Inc. Philadelphia, Pa.	5	5	0						
Eastern States Farmers' Exchange West Springfield, Mass.	30	30	0	14	14	0	1	1	0
Edgewood Farms, Inc. Ridgewood, N. J.							1	1	0
Empire Seed Co. Fredonia, N. Y.	5	5	0						
Fay, Herbert D. Watertown, Mass.				1	1	0			
Ferry-Morse Seed Co. Detroit, Mich.	30	30							
Fredonia Seed Co. Fredonia, N. Y.	17	17	0				1	1	0
Garfield, Williamsen Co. Jersey City, N. J.							1	1	0
General Mills, Farm Service Div. Fitchburg, Mass.				1	0	1			
Grey, Thomas J., Co. Boston, Mass.	11	10	1						
Harris, Joseph, & Co. Rochester, N. Y.	11	11	0						
Hart, Charles C., Seed Co. Wethersfield, Conn.	69	57	12				2	2	0
Hawkins, Budd D. Reading, Vt.	16	12	4						
Herbst Bros. New York, N. Y.	2	2	0						
Hygrade Seed Co. Fredonia, N. Y.	5	5	0						
Landtresh, D., Seed Co. Philadelphia, Pa.	4	4	0						
Mandeville & King Co. Rochester, N. Y.	11	11	0						
Merrimac Valley Nurseries Haverhill, Mass.	4	0	4						
Michael-Leonard Seed Co. Chicago, Ill.	2	1	1						
Midland Pelleted Seed Co. Midland, Michigan	7	7	0						

Table 4.—Summary of Inspection—Continued

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Northrup, King & Co.....	13	13	0						
Minneapolis, Minn.									
O & M Seed Co.....				2	2	0			
Chicago, Ill.									
Ostberg Seed Co.....				1	1	0	2	2	0
Chicago, Ill.									
The Page Seed Co.....	19	18	1	12	12	0	1	1	0
Greene, N. Y.									
Patten, George, Seed Co.....				4	4	0	3	1	2
Jersey City, N. J.									
Pedigreed Seed Co.....							1	1	0
New York, N. Y.									
Perry Seed Co.....	19	18	1						
Boston, Mass.									
Philadelphia Seed Co.....							1	1	0
Philadelphia, Pa.									
Radway Seed Farms.....							1	0	1
Nanuet, N. Y.									
Rice, Jerome B. Seed Co.....	13	13	0						
Cambridge, N. Y.									
Rice, J. B., Jr., Inc.....	9	9	0						
Shushan, N. Y.									
Robinson, Lawrence, & Sons.....	3	3	0						
Modesto, Cal.									
Ross Bros. Co.....	27	27	0	1	1	0	1	1	0
Worcester, Mass.									
Scarlett, Wm. G., & Co.....				31	25	6	2	2	0
Baltimore, Md.									
Sordillo, Joseph, & Sons.....	10	8	2						
Boston, Mass.									
Stanford Seed Co.....				30	27	3	5	5	0
Buffalo, N. Y.									
Vaughan's Seed Store.....	8	8	0						
New York, N. Y.									
Webster, H. K., & Co.....				2	2	0			
Lawrence, Mass.									
Whitney Seed Co.....				22	21	1	3	3	0
Buffalo, N. Y.									
Woodruff, F. H., & Sons.....	91	88	3	4	4	0	2	2	0
Milford, Conn.									
Woodruff, S. D., & Sons.....	76	72	4	2	2	0	2	2	0
Orange, Conn.									
TOTALS	754	714	40	210	188	22	42	33	9

TYPE AND VARIETY STUDIES OF VEGETABLES

Conducted by the Seed Laboratory
Waldo C. Lincoln, Jr., Laboratory Assistant
Under the Supervision of W. H. Lachman, Assistant Research Professor
Department of Olericulture

This is the fifteenth year that the Experiment Station has run field tests to determine the trueness to type of various kinds of vegetable seed offered for sale in this State. The State Seed Inspector purchased 317 samples of beans, beets, broccoli, cabbage, carrots, corn, radishes, rutabagas and turnips for trial in field test plots in order to compare plant characteristics with the labeled variety name. Planting was done June 12, 13 and 14 and growing conditions were good throughout the tests.

Conformity to type was the measure of comparison in the tests, and individual plants were called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration. Yield records were not taken nor were replications of plantings made. The large number of lots made this impossible.

The source of seed is given together with remarks on conformity to type, except that those lots of seed which were tested in the field and found 100 per cent true-to-type are not included in this table.

Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., New Haven, Conn.				
Essex Co. Cooperative Farming Assoc., Topsfield				
104 F	Corn	Golden Cross Bantam.....	96	Red Tasseled strain—4% yellow tassel—not too uniform
213 F	Radish	Shurtleff Hardware Col., Middleboro French Breakfast.....	99	1% pink flesh
405 F	Carrot	Spag's Hardware Co., Shrewsbury Danvers Half Long.....	94	6% tapered roots
United Co-operative Farmers, Inc., Fitchburg				
6 F	Beet	Crosby's Egyptian.....	50	50% tapered root—not flat
11 F	Cabbage	Copenhagen Market.....	95	5% Danish Ball Head type
117 F	Carrot	Nantes Improved Coreless.....	96	4% double rooted
119 F	Radish	Early Scarlet Globe.....	98	2% tapered root
116 F	Turnip	Purple Top White Globe.....	92	8% all white
Joseph Breck & Sons, Boston, Mass.				
439 F	Beet	Crosby's Egyptian.....	98	2% Swiss Chard
Chamberlain Hardware Co., W. Dennis Imperator.....				
1070 F	Carrot	Imperator.....	98	2% sp'it flesh
D'Arruda's General Store, Somerset				
140 F	Carrot	Danvers Half Long.....	85	15% long tapered root
142 F	Carrot	Morse's Bunching.....	94	6% double rooted
134 F	Corn	Carmelcross.....	90	10% off-type
W. Atlee Burpee Co., Philadelphia, Pa.				
Herman F. Davis, Merrimac				
1003 F	Turnip	White Egg.....	—	Found to be Golden Ball
East Longmeadow Grain Co., East Longmeadow				
834 F	Turnip	Golden Ball.....	73	18% all white—9% Purple Top White Globe
Gruener Hardware Store, Fitchburg				
305 F	Beet	Detroit Dark Red.....	94	6% flat rooted
311 F	Radish	Scarlet Globe.....	92	8% tapered root
310 F	Radish	Sparkler.....	96	2% purple flesh.—2% are 80% white
309 F	Rutabaga	Burpee's Purple Top Yellow.....	97	3% all yellow

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
349 F	Cabbage	Northboro Hardware Co., Northboro Copenhagen Market.....	—	Outer leaves bluish color— heads small
958 F	Beet	Quality Hardware Co., Haverhill Improved Blood.....	97	3% flat rooted
Comstock, Ferre & Co., Wethersfield, Conn.				
251 F	Beet	Felber Paint & Seed Co., Brockton Early Wonder.....	46	50% red leaves—2% flat bot- tom root—2% egg shape
247 F	Carrot	Improved Long Orange.....	96	4% double rooted
248 F	Carrot	Half Long Chantenay.....	96	4% yellow flesh
249 F	Radish	Early Scarlet Globe.....	96	4% light pink color
522 F	Radish	Jacques Hardware Co., Milford Early Scarlet Turnip White Tip....	50	50% no root development — poor strain
Arthur R. Cone, Inc., Buffalo, N. Y.				
387 F	Carrot	Harding Street Grain Store, Worcester Hutchinson.....	98	2% yellow flesh
S-184 F	Cabbage	Medfield State Hospital, Medfield Golden Acre.....	95	5% Danish Ball Head
Crosman Seed Co., Rochester, N. Y.				
Pittsfield Hardware & Plumbing Supply Co., Pittsfield				
1124 F	Beet	Crosby's Egyptian.....	94	6% tapered root
1121 F	Turnip	Purple Top White Globe.....	55	30% small yellow—15% flat rooted—poor strain
Henry A. Dreer, Inc., Philadelphia, Pa.				
1141 F	Carrot	F. W. Woolworth Co., No. Adams Chantenay Red Core.....	98	2% yellow flesh
Eastern States Farmers' Exchange, Inc., Springfield, Mass.				
Eastern States Farmers Exchange, Inc., Waltham				
285 F	Corn	Carmelcross.....	82	18% inbred type
Empire Seed Co., Fredonia, N. Y.				
593 F	Carrot	Woodlawn Supply Co., So. Hadley Danvers Half Long.....	94	4% yellow flesh—2% tapered root
Ferry Morse Seed Co., Detroit, Mich.				
1076 F	Turnip	Howards Hardware, Inc., Salem Purple Top White Globe.....	91	3% all purple—6% tapered root
1084 F	Turnip	Salem Hardware Co., Salem Golden Ball.....	60	40% small root development
Thomas J. Grey Co., Boston, Mass.				
477 F	Radish	Early Scarlet Globe.....	99	1% pink flesh and tapered root
Joseph Harris & Co., Rochester, N. Y.				
Joseph Harris & Co., Lexington				
495 F	Beet	Crosby's Egyptian.....	95	5% tapered root
499 F	Cabbage	Copenhagen Market.....	95	5% Jersey Wakefield
494 F	Radish	Cavalier.....	98	2% tapered root
Charles C. Hart Seed Co., Wethersfield, Conn.				
Conlon & Donnelly Co., Attleboro				
903 F	Corn	Lincoln.....	94	6% inbred type
907 F	Corn	Carmelcross.....	94	6% off-type
572 F	Cabbage	Federal Supply Co., Northampton Early Jersey Wakefield.....	95	5% triple headed
C. V. Hayes, Bridgewater				
171 F	Beet	Crosby's Egyptian.....	85	15% tapered root
172 F	Beet	Periected Detroit.....	94	6% flat bottom—Crosby's Egyptian type
169 F	Corn	Golden Bantam.....	—	Not Golden Bantam—prob- ably Golden Giant
163 F	Radish	Cherry Belle.....	98	1% pink flesh—1% purple flesh

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
14 F	Cabbage	Pierce Hardware Co., Taunton Golden Acre.....	95	5% double headed
15 F	Cabbage	Copenhagen Market.....	88	12% elongated heads
1213 F	Turnip	Sharon Hardware Co., Sharon White Egg.....	91	9% Purple Top White Globe
149 F	Carrot	Sunshine Feed Store, Bridgewater Danvers Half Long.....	91	9% long tapered roots
997 F	Rutabaga	Budd D. Hawkins, Reading, Vt. Herman F. Davis, Merrimac Improved Purple Top Yellow.....	88	9% Turnip—3% all yellow
1079 F	Carrot	Mandeville & King Co., Rochester, N. Y. Waters & Brown Co., Salem Danvers Half Long.....	92	8% yellow flesh
946 F	Turnip	Northrup, King & Co., Minneapolis, Minn. Ciolek Hardware Co., Ipswich Purple Top White Globe.....	92	8% tapered root
419 F	Radish	Perry Seed Co., Boston, Mass. Scarlet Globe.....	96	2% pink flesh—2% tapered root
545 F	Cabbage	J. B. Rice, Jr., Inc., Shushan, N. Y. Templeton Farmers Cooperative Assoc., Templeton Copenhagen Market.....	50	50% outer leaves bluish
546 F	Rutabaga	American Purple Top.....	97	3% Purple Top White Globe
548 F	Turnip	Purple Top Strap Leaf.....	91	3% all purple—6% all white
1248 F	Carrot	Ross Bros. Co., Worcester, Mass. Kindler Hardware Co., Webster Danvers Half Long, No. 2869.....	96	4% double rooted
1243 F	Turnip	Langer Hardware Co., Oxford Early Purple Flat Top.....	94	6% round rooted
1246 F	Rutabaga	Oxford Paint & Hardware Co., Oxford Golden Purple Top.....	97	3% Turnip
480 F	Cabbage	Joseph Sordillo & Sons, Boston, Mass. Early Summer Jersey Wakefield....	20	5% double headed, late, large, blue. None of heads conical 75% of heads not formed. Remainder round flat headed
483 F	Radish	Long Red.....	25	75% all vegetative growth with no root development Poor strain
511 F	Carrot	Vaughan's Seed Store, New York, N. Y. C. H. Symmes & Co., Winchester Imperator.....	96	4% Danvers Half Long type
542 F	Corn	F. H. Woodruff & Sons, Milford, Conn. Action Supply Co., So. Acton Victory Golden.....	82	18% off-type
321 F	Beet	Checkerboard Feed Store, Fitchburg Crosby's Egyptian.....	94	6% tapered root
153 F	Beet	J. H. Fairbanks Co., Bridgewater Detroit Dark Red.....	97	3% flat rooted
160 F	Rutabaga	American Purple Top.....	88	12% all top growth—no root development
297 F	Cabbage	Farm Bureau Assoc., Waltham Golden Acre.....	90	10% triple headed
298 F	Carrot	Danvers Half Long.....	94	6% double rooted
295 F	Corn	Lincoln.....	97	3% off-type
299 F	Turnip	Purple Top White Globe.....	85	12% all white—3% carrot shape
957 F	Radish	Haverhill Hardware & Plumbing Supply Co., Haverhill French Breakfast.....	—	Very poor strain—roots tapered
954 F	Radish	Sparkler White Tip.....	95	5% purple with white tip
952 F	Rutabaga	Long Island Improved.....	97	3% went to seed
948 F	Turnip	White Egg.....	85	15% flat rooted

Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type	Remarks
966 F	Radish	Merrimac Valley Nurseries, Haverhill Scarlet Globe Special.....	98	2% pink rooted—tendency for remainder to be very slightly pink
1127 F	Carrot	Peirson Hardware Co., Pittsfield Danvers Half Long.....	98	2% yellow flesh
S. D. Woodruff & Sons, Orange, Conn.				
534 F	Rutabaga	Faitte Hardware Co., Middleboro Long Island Improved.....	97	3% Purple Top White Milan Turnip
533 F	Turnip	Purple Top White Globe.....	94	3% small white—3% flat rooted
S-60 F	Beet	Walter E. Fernald State School, Waverly Early Wonder.....	80	20% light orange—red color
934 F	Radish	Lunt & Kelley Hardware Co., Newburyport Orange Scarlet Globe.....	83	9% purple color—8% tapered root
S-190 F	Beet	Medfield State Hospital, Medfield Early Wonder.....	98	2% light green leaf stalk
S-178 F	Turnip	State Farm, Bridgewater Purple Top White Globe.....	97	3% all white
S-129 F	Turnip	Taunton State Hospital, Taunton Purple Top White Globe.....	89	3% small yellow—8% flat rooted
S-335 F	Beet	Worcester State Hospital, Worcester Early Wonder.....	95	5% developed flower stalks

STUDIES OF FLOWER SEEDS

Conducted by the Seed Laboratory
 Waldo C. Lincoln, Jr., Laboratory Assistant
 Under the Supervision of
 Clark L. Thayer, Professor, Department of Floriculture

This is the fifteenth year in which flower seed studies have been conducted by the Seed Laboratory to determine the quality of flower seeds offered for sale in various retail outlets. Seed of 270 lots, representing 47 genera, packeted by 26 wholesalers or distributors, were obtained from 48 retail sources by the Seed Inspector. Nineteen lots of *Ipomoea* and one perennial were collected but were not tested.

The lots were distributed among the various genera as follows:

Ageratum.....6	Cynoglossum.....4	Mirabilis.....3
Alyssum.....9	Dahlia.....1	Nicotiana.....3
Amaranthus.....1	Delphinium.....4	Papaver.....4
Anchusa.....1	Dianthus.....3	Petunia.....30
Antirrhinum.....6	Didiscus.....2	Phlox.....4
Browallia.....1	Dimorphotheca.....1	Portulaca.....8
Calendula.....12	Eschscholtzia.....3	Reseda.....1
Calliopsis.....3	Gypsophila.....2	Salpiglossis.....1
Callistephus.....15	Helianthus.....1	Salvia.....2
Celosia.....3	Helichrysum.....2	Scabiosa.....3
Centaurea.....12	Hollyhocks.....2	Tagetes.....20
Chrysanthemum.....1	Iberis.....2	Tropaeolum.....19
Clarkia.....1	Impatiens.....3	Verbena.....7
Cleome.....2	Linaria.....1	Zinnia.....38
Convolvulus.....1	Lupinus.....3	Wild Flower Collection.....1
Cosmos.....16	Malcomia.....2	
		TOTAL.....270

Dates of sowing were June 7, 8, and 9. Seeds were sown in twenty-foot sections in the row and in most cases, because of the small quantity of seed in a packet, it required the entire package of seed to plant the section; in a few lots there were not enough seeds in a packet to plant the twenty-foot section.

Germination tests were not made in the laboratory on any of the lots of seed. Results of germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair" between one-third and two-thirds; "poor" for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, regardless of the number of plants, with only one-third or less of the plants not true to form or color; "fair" between one-third and two-thirds not true; and not satisfactory if less than one-third was true to name. Fifty-four lots which showed "poor" or "none" germination were replanted June 26 and 27. Lots which did not produce sufficient plants for providing satisfactory data are so indicated.

Conditions are not always ideal for the best germination of any given lot of seed, hence when there was no germination or when the germination was poor, a second sowing of the seed was made.

Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Joseph Breck & Sons, Boston, Mass.				
909 F	Alyssum	Violet Queen 0121.....	Good	Satisfactory
910 F	Antirrhinum	Breck's Cherry Ripe.....	Good	Did not mature
913 F	Browallia	Elata-Deep Violet Blue 0861.....	Good	Satisfactory
914 F	Calliopsis	Golden Crown 0952.....	Fair	Satisfactory
912 F	Callistephus	Early Giants Light Blue 0566.....	Good	Satisfactory
911 F	Callistephus	Princess Finest Mixed 0662.....	Fair	Satisfactory
919 F	Cleome	Pink Queen 1400.....	Good	Satisfactory
918 F	Convolvulus	Royal Ensign 1428.....	Fair	Satisfactory
931 F	Cosmos	Breck's Cupped Pink 1450.....	Poor	Satisfactory
920 F	Cosmos	Sensation Mixed Colors 1471.....	Good	Satisfactory; 3 colors
916 F	Cynoglossum	Firmament Blue.....	Good	Satisfactory
917 F	Cynoglossum	Pink Firmament 1543.....	Fair	10% Blue
921 F	Dianthus	Breck's Geisha Girl 1664.....	Fair	Satisfactory
922 F	Lupinus	Pixie Delight 2433.....	Fair	Satisfactory
926 F	Petunia	All Double Victorious Blue Brocade 3092.....	Poor	1 plant
925 F	Petunia	Breck's Giant White Single 2942	Fair	20% Violet
923 F	Tagetes	Double African Sunset Giants 2552.....	Good	Satisfactory as to habit of growth, but did not flower
924 F	Tagetes	Double French Harmony Hybrid 2612.....	Good	Satisfactory
927 F	Zinnia	California Giants 4279 Daffodil	Good	4% Orange
928 F	Zinnia	California Giants Purity 4289.....	Good	Satisfactory
929 F	Zinnia	California Miss Wilmot 4286.....	Fair	8% Scarlet Red
930 F	Zinnia	California Scarlet Queen 4291 (Giant).....	Good	Satisfactory
W. Atlee Burpee Co., Philadelphia, Pa.				
C. B. Coburn Co., Lowell				
771 F	Alyssum	Little Gem.....	Good	Satisfactory
778 F	Calendula	Orange Fantasy.....	Poor	Satisfactory
779 F	Calendula	Yellow Colossal.....	Good	Satisfactory
776 F	Cosmos	Orange Flare Early Flowering.....	Good	Satisfactory
773 F	Cynoglossum	Blanche Burpee Mixed Colors.....	Good	Satisfactory
770 F	Hollyhocks	Annual Mixed.....	Good	Did not mature
777 F	Salpiglossis	Mixed.....	Good	Too few plants matured for a performance test
774 F	Tagetes	Harmony French Dwarf.....	Good	6% Tall type
772 F	Tropaeolum	Golden Gleam.....	Good	Satisfactory
775 F	Zinnia	Gigantic Art Shades.....	Fair	Satisfactory; 7 Shades
Northboro Hardware Co., Northboro				
350 F	Calendula	Double Mixed.....	Fair	Satisfactory
Wood Square Hardware Co., Hudson				
673 F	Petunia	Floribunda Large Single Mixed	Good	Satisfactory; 6 colors
672 F	Tagetes	Carnation Chrysanthemum & Peony Flowered Blend.....	Good	Satisfactory as to habit of growth, but did not flower
674 F	Zinnia	Colossal & Chrysanthemum Flowered.....	Good	Satisfactory; 8 colors
The Clapper Co., Newton, Mass.				
986 F	Ageratum	Blue Perfection.....	Poor	Too few plants for a performance test
988 F	Calendula	Orange Shaggy.....	Fair	Satisfactory
987 F	Callistephus	Giant Sunshine Mixed.....	None	
Comstock, Ferre & Co., Wethersfield, Conn.				
Joseph Sordillo & Sons, Boston				
489 F	Portulaca	Double Mixed.....	Good	7 colors; 10% single
Crosman Seed Corp., East Rochester, New York				
S. S. Kresge Co., Lowell				
750 F	Ageratum	Fairy Pink.....	Poor	Satisfactory
759 F	Amaranthus	Molten Fire.....	Good	Satisfactory
748 F	Centaurea	Double Pink.....	Fair	5% Red
749 F	Centaurea	Ruby Red.....	Fair	5% Lavender
751 F	Didiscus	Queen Anne's Lace Flower.....	Good	Satisfactory
753 F	Petunia	Fire Chief.....	Fair	Too few plants for a performance test
757 F	Petunia	General Dodds.....	Good	Satisfactory
754 F	Petunia	Rose of Heaven.....	Poor	Too few plants for a performance test

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
752 F	Tagetes	Giant African Lemon	Good	Did not flower but habit of growth good
756 F	Tropaeolum	Semi-double Scarlet Gleam	Good	Satisfactory
758 F	Zinnia	Giant Dahlia Flowering	Fair	3% Pink
Deerington Zinnia Gardens, Bargesville, Ind.				
F. W. Woolworth Co., Hudson				
655 F	Zinnia	Baby Bee Double Bloom Mixed	Good	Fair; only 2 colors
656 F	Zinnia	Deerington Special Double Bloom Mixed Colors	Good	Satisfactory; 7 colors
H. A. Dreer & Co., Philadelphia, Pa.				
F. W. Woolworth Co., No. Adams				
1146 F	Callistephus	Late Branching Mixed (Pelleted)	Poor	Too few plants for a performance test
1147 F	Eschscholtzia	California Wonder (Pelleted)	Poor	Too few plants for a performance test
1148 F	Portulaca	Single Mixed (Pelleted)	None	
Ferry-Morse Seed Co., Detroit, Mich.				
Vinol Square Market, No. Chelmsford				
652 F	Centaurea	Blue Boy	Good	Satisfactory
65 F	Cosmos	Yellow Flare	Good	Satisfactory
651 F	Tropaeolum	Gleam Hybrids	Good	Satisfactory
653 F	Zinnia	Crimson Monarch Giant Double Dahlia Flowered	Good	Satisfactory
Wood Square Hardware, Inc., Hudson				
670 F	Callistephus	Giant Crego Mixed	None	
667 F	Dianthus	Double Carnation Shades	Good	8 shades; 6% single
668 F	Eschscholtzia	Extra Golden California	Good	Satisfactory
669 F	Tagetes	Dwarf Melody	Good	Satisfactory
666 F	Zinnia	Giant Double Dahlia Flowered	Good	Satisfactory
Fredonia Seed Co., Fredonia, N. Y.				
Clover Farm Stores, Forge Village				
643 F	Petunia	Howard's Star	Good	Satisfactory
664 F	Tropaeolum	Golden Gleam	Good	Satisfactory
646 F	Zinnia	California Giants Mixed	Good	Satisfactory; 6 colors
645 F	Zinnia	Dahlia Flowered Scarlet	Good	Satisfactory
Germain's, Inc., Los Angeles, Cal.				
F. W. Woolworth Co., Wakefield				
1159 F	Zinnia	Kolorcoat California Giant (Pelleted)	Good	Satisfactory; 6 colors
Thomas J. Grey Co., Weymouth, Mass.				
459 F	Callistephus	Crego Rose Pink	Good	Satisfactory
458 F	Callistephus	Princess Margaret Rose	Fair	Satisfactory
465 F	Cleome	Pink Queen Spider Plant	Good	Satisfactory
461 F	Delphinium	Giant Regal Mixed	Poor	Too few plants for a performance test
462 F	Petunia	Balcony Mixed	Fair	Satisfactory; 4 colors
466 F	Petunia	White Cloud	Poor	Too few plants for a performance test
467 F	Phlox	Gigantea Mellow Moon	Good	Satisfactory
460 F	Tagetes	Mission Giant Firefly Glowing Orange	Fair	Did not flower but habit of growth good
464 F	Tagetes	Naughty Marietta French	Good	Satisfactory
463 F	Verbena	Ink Bush Salmon Queen	Good	Satisfactory
Joseph Harris & Co., Rochester, N. Y.				
Joseph Harris & Co., Lexington				
503 F	Calendula	Pacific Beauty Apricot	Fair	6% Orange King
504 F	Callistephus	Harris' Eight Best Mixed Colors	Good	Satisfactory; 7 colors
505 F	Chrysanthemum	Annual Mixed	Poor	Too few plants for a performance test
502 F	Tagetes	Dwarf Double French Spry	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Charles C. Hart Seed Co., Wethersfield, Conn.				
Acme Supply Co., Maynard				
668 F	Lupine	Hartwegi Mixed.....	Fair	Satisfactory
611 F	Petunia	Rosy Morn.....	Fair	Satisfactory
612 F	Portulaca	Single Mixed Colors.....	Fair	Satisfactory; 6 colors
610 F	Reseda	Giant Market Type.....	Good	Satisfactory
Dean Hardware Co., Maynard				
803 F	Calendula	Orange King.....	Good	Satisfactory
805 F	Petunia	Balcony Blue.....	Fair	Satisfactory
806 F	Tropaeolum	Golden Gleam.....	Poor	Satisfactory
804 F	Zinnia	Hart's Finest Mixture.....	Good	Satisfactory; 4 colors
F. F. Rogers & Co., Stowe				
677 F	Centaurea	Double Blue Florist Strain.....	Good	Satisfactory
675 F	Lupine	Mixed Hartwegi.....	Good	Satisfactory
679 F	Petunia	Balcony Blue.....	Good	Satisfactory
680 F	Tropaeolum	Golden Gleam Sweet Scented Double.....	Fair	Satisfactory
676 F	Zinnia	Hart's Finest Mixture.....	Good	Satisfactory; 6 colors
Spear Hardware Co., Canton				
693 F	Calendula	Orange King.....	Good	2% yellow
691 F	Phlox	Mixed Colors.....	Fair	Satisfactory; 6 colors
690 F	Portulaca	Double Mixed Colors.....	Good	6 colors
694 F	Tagetes	African Tall Double Eldorado....	Good	Did not flower but habit of growth good
689 F	Tropaeolum	Golden Gleam.....	Fair	Satisfactory
692 F	Zinnia	Hart's Finest Mixture.....	Good	Satisfactory; 5 colors
Sunshine Feed Store, Ayer				
632 F	Gypsophila	White.....	Good	Satisfactory
633 F	Helichrysum	Mixed.....	Fair	Satisfactory
631 F	Impatiens	Choice Double Mixed Colors....	Good	Satisfactory; 5 colors
634 F	Tagetes	Colarette Crown of Gold.....	Fair	Satisfactory
630 F	Tropaeolum	Golden Gleam Double.....	Fair	Satisfactory
Web's Store, West Townsend				
736 F	Calendula	Orange King.....	Good	8% "Radio"
735 F	Cosmos	Giant Early Flowering.....	Good	Satisfactory; 4 colors
734 F	Helianthus	Russian Mammoth.....	Good	Satisfactory
737 F	Petunia	Balcony Blue.....	Poor	Too few plants for a per- formance test
733 F	Tropaeolum	Golden Gleam.....	Poor	Satisfactory
Budd D. Hawkins, Reading, Vt.				
Elmer H. Brow, Dunstable				
744 F	Tropaeolum	Dwarf Mixed.....	Fair	Satisfactory
742 F	Wild Flower	Garden Several Varieties Mixed.....	Good	Satisfactory; 16 varieties
Hygrade Seed Co., Fredonia, N. Y.				
So. Acton Public School, So. Acton				
793 F	Calendula	Equisite Mixed Colors.....	Good	Satisfactory; 3 colors
796 F	Calliopsis	Double Mixed Colors.....	Fair	Satisfactory
797 F	Cosmos	Sensation Mixed.....	Good	Satisfactory; 2 colors
792 F	Petunia	Exquisite Hybrida Mixed.....	Good	Satisfactory; 5 colors
795 F	Zinnia	California Giants Mixed.....	Good	Satisfactory; 7 colors
Mandeville & King Co., Rochester, N. Y.				
Acton Supply Co., So. Acton				
682 F	Hollyhocks	Indian Spring Shades of Pink...	Fair	11 plants; did not mature
686 F	Malcomia	All Colors.....	Good	Satisfactory
687 F	Papaver	American Legion.....	Fair	5% off type
681 F	Petunia	English Violet Blue.....	Fair	Satisfactory
683 F	Tropaeolum	Mahogany Gem Dwarf Double....	Good	Satisfactory
684 F	Zinnia	California Giant Canary Yellow..	Good	6% orange flowered
685 F	Zinnia	California Giant Miss Wilmot Soft Pink.....	Good	Satisfactory

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
H. Bruckman, Lawrence				
808 F	Callistephus	Giant Comet—All Colors.....	Good	Satisfactory; 4 colors
813 F	Callistephus	Rosalie-Rose.....	Fair	Satisfactory
809 F	Centaurea	Pinkie.....	Good	Satisfactory
810 F	Impatiens	Camellia Flowered All Colors....	Good	Satisfactory
807 F	Petunia	Viola Purple Deep Blue.....	Good	Satisfactory
814 F	Tagetes	Mammoth Mum Lemon Yellow.....	Fair	Did not flower but habit of growth good
812 F	Verbena	Lavender Glory Giant Hybrid....	Fair	20% white—5% pink—10% violet
811 F	Zinnia	Fantasy Star Dust Golden Yellow	Good	2% orange—14% not Fantasy type
Clover Farm Stores, Forge Village				
641 F	Mirabilis	All Colors.....	Fair	Satisfactory; 5 colors
642 F	Zinnia	Will Rogers Scarlet Giant Dahlia Flowered.....	Good	Satisfactory
Davis Hardware Co., Gardner				
711 F	Cosmos	Radiance Two-Tone.....	Good	Satisfactory
708 F	Dahlia	All Colors Dwarf Newer Types..	Good	Too few plants matured for a performance test
714 F	Nicotiana	All Colors.....	Good	Satisfactory
713 F	Petunia	Violet Gem.....	None	
712 F	Tropaeolum	Scarlet Gleam.....	Good	Satisfactory
709 F	Zinnia	Fantasy Lavender Melody.....	Good	Satisfactory
715 F	Zinnia	California Giant Canary Yellow..	Good	Satisfactory
L. Roy Hawes, Maynard				
606 F	Antirrhinum	Rust Proof All Colors.....	Fair	Satisfactory; 6 colors
604 F	Cosmos	Radiance Two-Tone.....	Good	Satisfactory
605 F	Eschscholtzia	Orange.....	Good	Satisfactory
607 F	Petunia	Balcony Rose.....	Good	Satisfactory
603 F	Zinnia	Scarlet Dwarf Zinnia "Little Red Riding Hood".....	Good	Satisfactory
Kerby, Reed & Bryant, Harvard				
786 F	Cosmos	Sensation All Colors (Giants)....	Good	Satisfactory; 4 colors
789 F	Petunia	Blue Bee-Medium Blue.....	Fair	Satisfactory
790 F	Petunia	Radiance—Brilliant—Rose.....	Fair	Satisfactory
791 F	Petunia	Rose of Heaven Improved.....	Fair	Too few plants for a performance test
787 F	Zinnia	California Giant Salmon Rose....	Fair	Satisfactory
788 F	Zinnia	Tom Thumb.....	Good	Satisfactory; 6 colors
Parker Hardware Co., Maynard				
628 F	Ageratum.	Lavender Blue.....	Good	Too few plants matured for a performance test
629 F	Dimorphotheca	African Daisy All Colors.....	Good	Satisfactory; 4 colors
627 F	Scabiosa	Blue Cockade Mourning Bride....	Poor	Too few plants for a performance test
Spear Hardware Co., Canton				
698 F	Ageratum	Lavender Blue.....	Poor	Satisfactory
699 F	Calendula	All Shades.....	Good	Satisfactory
701 F	Cosmos	Radiance Two-Tone.....	Good	Satisfactory
695 F	Petunia	Martha Washington Dwarf Ruffled.....	Poor	Too few plants for a performance test
700 F	Tagetes	Dwarf Harmony.....	Good	Satisfactory
697 F	Tropaeolum	Scarlet Gem—Dwarf Dble.....	Good	Satisfactory
696 F	Zinnia	California Giant Red "Cherry Queen".....	Good	Satisfactory
Midland Pelleted Seed Co., Midland, Mich.				
D. Cashman Hardware Co., Newburyport				
940 F	Verbena	Mammoth Mixed Pelleted.....	Fair	Satisfactory; 6 colors
Franklin Hardware Co., Attleboro				
908 F	Portulaca	Double Mixed (Pelleted).....	None	
Upton Hardware Co., Athol				
1010 F	Malcomia	Giant Imperial Mixed (Pelleted)	Good	Did not mature
Woodlawn Supply Co., So. Hadley				
850 F	Petunia	Rosy Morn (Pelleted).....	Poor	Too few plants for a performance test

Flower Seed Inspection—Continued

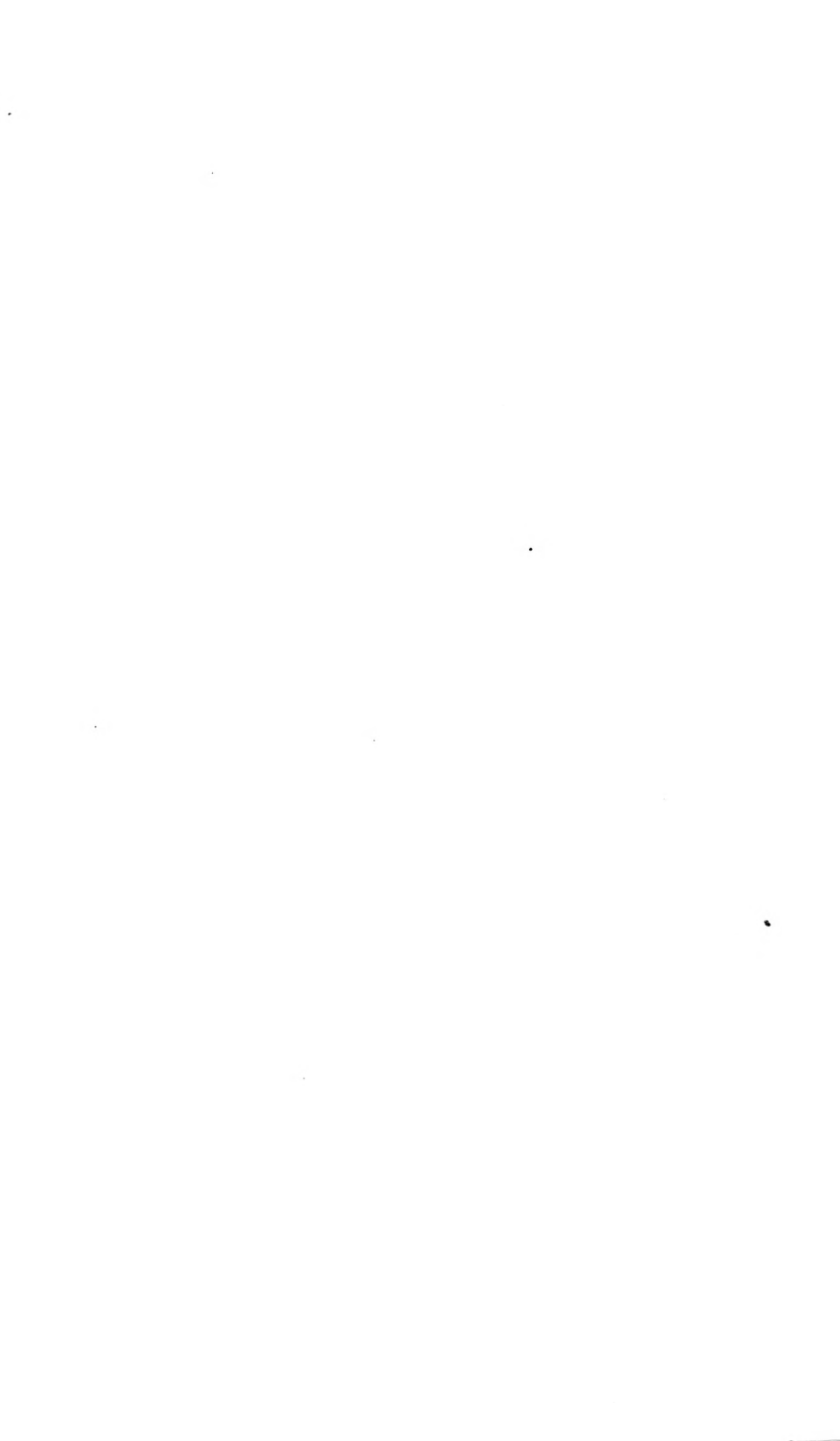
Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Northrup, King & Co., Minneapolis, Minn.				
636 F	Callistephus	W. E. Aubuchon Co., Inc., Ayer Crego, Wilt Resistant, Red.	Good	To few plants matured for a performance test
640 F	Celosia	Tall Red Shades.	Good	Satisfactory; 4 shades
639 F	Cynoglossum	Dwarf Firmament Rich Blue Flowers.	Poor	Too few plants for a performance test
637 F	Linaria	All Colors Fairy Bouquet.	Good	Satisfactory; 7 colors
638 F	Nicotiana	Flowering White.	Good	Satisfactory
No. Chelmsford Hardware Co., No. Chelmsford				
650 F	Antirrhinum	Grandiflora Rust Resistant Mixed	Fair	Satisfactory; 6 colors
648 F	Helichrysum	Monstrosum Mixed.	Poor	Too few plants for a performance test
649 F	Portulaca	Single Mixed.	Fair	Satisfactory; 8 colors
United Cooperative Society, Maynard				
621 F	Papaver	American Legion, Shirley.	Good	12% off type
F. W. Woolworth Co., Hudson				
663 F	Ageratum	Blue Perfection.	Fair	Satisfactory
661 F	Alyssum	Violet Queen.	Good	Satisfactory
665 F	Callistephus	Queen of the Market Mixed.	Good	Satisfactory
664 F	Clarkia	Double Mixed.	Poor	Satisfactory; 3 colors
658 F	Cosmos	Sensation, Giant Dazzler.	Good	Satisfactory
660 F	Portulaca	Single Mixed.	Fair	Satisfactory; 7 colors
657 F	Salvia	Splendens Scarlet Sage Bonfire.	Fair	Satisfactory
659 F	Verbena	Mammoth Flowering Blue Shades	Fair	Satisfactory
662 F	Zinnia	California Giant, Double White.	Good	Satisfactory
F. W. Woolworth Co., Maynard				
624 F	Ageratum	Blue Perfection.	Good	Satisfactory
623 F	Alyssum	Double Mixed Colors.	Good	Satisfactory; 5 colors
625 F	Cosmos	Early Large Flowering Mixed.	Fair	Satisfactory; 4 colors
622 F	Didiscus	Blue Lace Flower.	Fair	Satisfactory
626 F	Tagetes	Melody.	Good	Satisfactory
The Page Seed Co., Greene, N. Y.				
732 F	Callistephus	Bengston Hardware Co., Gardner Giant Comet.	Good	5% developed "yellows" 5 colors
730 F	Tropaeolum	Dwarf Mixed Colors.	Good	Satisfactory
Seder & Richmond Co., Maynard				
600 F	Alyssum	Sweet, White.	Good	Satisfactory
602 F	Calendula	Radio.	Good	4% yellow
Perry Seed Co., Boston, Mass.				
431 F	Antirrhinum	Maximum or Super Giants Mixed Rust Resistant.	Good	Satisfactory; 6 colors
427 F	Celosia	Finest Mixed.	Good	Satisfactory; 5 colors
424 F	Centaurea	Double Blue Boy.	Good	Satisfactory
425 F	Cosmos	Sensation Radiance Deep Rose.	Good	Satisfactory
429 F	Delphinium	Super Majestic Mixed.	Fair	Satisfactory; 4 colors
428 F	Dianthus	Heddeewigi Laciniatus Gaiety.	Fair	Satisfactory; 7 shades
423 F	Iberis	Giant White Perfection.	Good	Satisfactory
430 F	Tagetes	Dwarf Double French Spry Hybrids.	Good	Satisfactory
426 F	Tagetes	Dwarf Single French Naughty Marietta.	Good	Satisfactory
432 F	Zinnia	California Giants Pastel Shades Mixed.	Good	Satisfactory; 10 shades
Jerome B. Rice Seed Co., Cambridge, N. Y.				
747 F	Antirrhinum	Elmer H. Brow, Dunstable Fine Mixed.	Good	Satisfactory; 5 colors
745 F	Zinnia	Super Giant Cherry Queen.	Good	Satisfactory
Canton Supply Co., Canton				
707 F	Centaurea	Double Blue.	Good	Satisfactory
706 F	Cosmos	Giant Sensation Mixed.	Good	Satisfactory; 5 colors
702 F	Gypsophila	Covent Garden Market.	Good	Satisfactory
705 F	Iberis	Mixed.	Good	Satisfactory
704 F	Zinnia	Dahlia Flowered Mixed.	Good	Satisfactory; 4 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
R. F. Powell Hardware Co., Townsend				
739 F	Callistephus	American Branching Mixed.....	Fair	Too few plants for a performance test
738 F	Centaurea	Double Blue.....	Good	Satisfactory
741 F	Petunia	Flaming Velvet.....	Fair	Satisfactory
740 F	Tropaeolum	Dwarf Mixed.....	Good	Satisfactory
United Cooperative Society, Maynard				
615 F	Papaver	American Legion.....	Good	4% off type
618 F	Petunia	Flaming Velvet.....	Good	Satisfactory
617 F	Phlox	Annual Mixed.....	Poor	Satisfactory; 4 colors
616 F	Tropaeolum	Gleam Hybrid.....	Good	Satisfactory
619 F	Zinnia	Super Giant Cherry Queen.....	Good	Satisfactory
Ross Bros. Co., Worcester, Mass.				
366 F	Alyssum	Carpet of Snow.....	Good	Satisfactory
367 F	Anchusa	Blue Bird.....	Good	Satisfactory
368 F	Celosia	Glasgow Prize.....	Good	Satisfactory
369 F	Centaurea	Jubilee Gem.....	Good	Satisfactory
370 F	Cosmos	Sensation Radiance.....	Good	Satisfactory
373 F	Nicotiana	Sanderacrimson King.....	Good	Satisfactory
374 F	Petunia	Flaming Velvet.....	Good	Satisfactory
375 F	Salvia	Splendens Grandiflora.....	Fair	Satisfactory
372 F	Tagetes	French Dwarf Single Naughty Marietta.....	Good	Satisfactory
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Gardner				
729 F	Calendula	Pot Marigold Mixed.....	Good	Satisfactory
727 F	Delphinium	Double Mixed.....	Fair	Satisfactory; 4 colors
723 F	Petunia	Filcoat Pelleted Seeds.....	None	
725 F	Scabiosa	Mourning Bride Mixed.....	Poor	Too few plants for a performance test
724 F	Tropaeolum	Golden Gleam.....	Good	Satisfactory
726 F	Zinnia	Super Giant Pink.....	Good	Satisfactory
Sterling Seed Co., Minneapolis, Minn.				
F. L. Green Co., Inc., Lowell				
767 F	Alyssum	Sweet.....	Good	Satisfactory
768 F	Centaurea	Jubilee Gem.....	Good	Satisfactory
769 F	Mirabilis	Marvel of Peru.....	Good	Satisfactory; 5 colors
760 F	Petunia	Rosy Morn.....	Good	Satisfactory
764 F	Tagetes	Harmony, Dwarf French.....	Good	Satisfactory
766 F	Tropaeolum	Dwarf Choice Colors Mixed.....	Good	Satisfactory
765 F	Verbena	Mammoth Flowering Mixed Colors.....	Fair	Satisfactory; 8 colors
762 F	Zinnia	California Giant Double Canary Yellow Daffodil.....	Fair	3% Orange
763 F	Zinnia	California Giant Double Purple Violet Queen.....	Good	Satisfactory
761 F	Zinnia	California Giant Double White Purity.....	Good	3% Pink
Vaughan's Seed Store, New York, N. Y.				
B. W. Brown Grain Co., Concord				
1163 F	Alyssum	Little Gem.....	Fair	Satisfactory
1166 F	Antirrhinum	Rust Resistant Mixed.....	Fair	Satisfactory; 5 colors
1167 F	Callistephus	Giant Branching Mixed Colors.....	None	
1164 F	Delphinium	Giant Imperial Mixed.....	Poor	Too few plants for a performance test
1162 F	Mirabilis	Mixed Colors.....	Good	Satisfactory; 5 colors
1161 F	Papaver	Mixed All Kinds.....	Poor	Satisfactory; 3 colors
1165 F	Petunia	Hybrida Mixed All Kinds.....	Fair	Satisfactory; 7 colors
1168 F	Phlox	Grandiflora Splendid Mix.....	None	
1170 F	Tropaeolum	Double Glorious Gleam Hybrids	Good	Satisfactory
1169 F - a	Verbena	Hybrida Grandiflora Choice Mixed.....	Poor	4 colors
1169 F - b	Verbena	Hybrida Grandiflora Choice Mixed No. 2138.....	Poor	2 colors
S. D. Woodruff & Sons, Orange, Conn.				
A. J. Bibeau Hardware Co., Gardner				
719 F	Alyssum	Violet Queen.....	Fair	Satisfactory
720 F	Calliopsis	Dwarf Mixed.....	Good	Satisfactory
718 F	Centaurea	Double Blue.....	Fair	Satisfactory
716 F	Impatiens	Camellia Flowered Finest Mix..	Good	Satisfactory; 6 colors

Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
S. D. Woodruff & Sons, Orange, Conn.—Continued				
A. J. Bibeau Hardware Co.,—Continued				
722 F	Scabiosa	Tall Double Flowering All Colors	Fair	Satisfactory
721 F	Tagetes	Yellow Supreme Carnation Flowered.....	Good	Satisfactory
717 F	Zinnia	California Giants, All Colors....	Good	Satisfactory; 5 colors
Cover Grain & Feed Co., Lowell				
781 F	Alyssum	Violet Queen.....	Good	Satisfactory
789 F	Cosmos	Yellow Flare.....	Fair	10% Orange Flare
783 F	Petunia	Flaming Velvet Crimson.....	Good	Satisfactory
782 F	Portulaca	Double Flowering All Colors....	Fair	9 colors; 15% single
785 F	Tagetes	French Dwarf Double Harmony	Good	6% tall type



MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 148

JUNE 1951

**Inspection of Commercial
Feedstuffs**

By FEED CONTROL SERVICE STAFF

This is the fifty-seventh report on feeding stuffs inspection. Included are data on the composition of mixed feeds, mineral and vitamin supplements, feed ingredients and medicated feeds. Included also is other information of interest to the manufacturers, distributors and users of feed.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Assistant Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
Edward S. Berestka, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

Foreword

Until a comparatively few years ago the inspection and analysis of feeds was a relatively simple matter. The manufacturer guaranteed protein, fat, fiber and carbohydrate or nitrogen-free extract. The list of ingredients, although containing a rather wide variety of materials, did not remind the reader of a page in the U. S. Pharmacopoeia. The control official had no particular difficulty in either substantiating or refuting the manufacturer's claims.

An examination of this bulletin will show how much times have changed. In it are reported the results of tests for protein, fat, fiber, ash, calcium, cobalt, copper, iodine, iron, magnesium, manganese, nickel, phosphorus, salt, zinc, vitamin A, vitamin D, carotene, choline, riboflavin, nitrophenide, nitrosal, and sulfaquinoxaline.

The tests enumerated still do not cover all of the claims made. For example, at present this Control Service is not checking on the claims for such dietary factors as vitamin B₁₂, the antibiotics from the various sources, niacin and pantothenic acid.

Although the appearance of new drugs and dietary factors in feeds has presented the control official with analytical problems, the manufacturer has encountered much greater problems involving the handling, mixing, and keeping qualities of these materials. Unless the manufacturer of mixed feeds buys accurately pre-mixed supplements or concentrates the proper blending of the minerals, vitamins and drugs with the usual feed ingredients to insure uniform distribution throughout the feed mixture requires not only costly equipment but also the technical "know-how" to operate efficiently such equipment.

The manufacturer's concern does not end with the knowledge that the feed has been properly mixed. Some of the ingredients used would deteriorate comparatively quickly during storage if precautions were not taken to prevent this. By the use of anti-oxidants and other means the manufacturer prolongs the keeping qualities of the less stable ingredients so that the mixed feed, even after a reasonable period of storage, still contains all factors in amounts adequate to accomplish its intended purpose. The fact that so few guarantees are found seriously out of line is a tribute to the ability and resourcefulness of those engaged in the production of feeds.

REQUESTS FOR SPECIAL ANALYSES

Each year the Control Service receives a considerable number of feed samples from individuals who suspect that the feed in question is causing the death of livestock. Usually it is suspected that the feed either contains ingredients toxic to livestock or is lacking in certain nutritional factors.

Since complying with all the requests without question would entail more work than the Control Service can afford to spend in this direction, it has been found necessary to screen all such requests. In this way a great deal of unnecessary analytical work has been avoided.

For the guidance of those who will request analytical work because feed is thought to be causing the death of livestock, it is suggested that they:

1. Consult a veterinarian immediately upon noticing anything wrong. If disease is the cause of the trouble, valuable time will be lost if, instead of consulting a veterinarian, the owner of the livestock suspects the feed and waits for our analysis to tell him the cause of the trouble.
2. Save at least one unopened sack of feed with the attached analysis tag. In too many cases the only feed left is a handful in the hopper or a few pounds remaining in a bag. Upon investigation it was found in one case that the sample sent in actually represented feed that had been dropped along the way to the hoppers and was subsequently swept up.
3. Notify the Control Service if the veterinarian has cause to suspect the feed, sending the veterinarian's report. The Control Service Inspector will take an official sample and will also get additional information on the case. No analysis will be made except on official samples.

The veterinarian's report usually furnishes clues to the probable causes of the trouble. If the presence of toxic ingredients is indicated, the feed will be tested by feeding it to a trial group of chickens or rats, depending upon whether poultry or other animals are involved. This is the only sure way to prove whether or not the feed contains poisonous material. It is virtually impossible to analyze a feed and, however extensive the analysis may be, to state unequivocally that the feed contains no poison. The Control Service has never found a poisonous ingredient in a mixed feed, although excessive quantities of salt have been found in a few cases. Vitamin and mineral deficiencies have been encountered in other cases.

If the veterinarian diagnoses the case as that involving nutritional deficiency, his report indicates the factor probably lacking.

The following letter dated April 2, 1951, shows the necessity for insisting that the above procedure be followed:

"I am sending along three samples of feed for analysis. Please tell me what you can find wrong with them that could curtail production causing molting and mortality. The feed is definitely old and moldy. I also want to know if the same three samples vary as to ingredients and protein."

When the samples were received it was obvious that the feed was old. Following the usual policy, the inspector was sent to get an official sample and further data on the case. He found that the feed in question was delivered in March 1950 and that the samples sent were almost all the feed remaining. The owner claimed that during a period of three or four months he lost 350 birds out of a total of 900. He thought the feed had been stored too long before delivery and wanted the Control Service to prove this more than a year after delivery.

The policy followed in accepting samples of viscera and stomach contents of animals in cases of suspected poisoning is somewhat similar to that for feeds. In all instances a veterinarian's report is required. No analytical work will be done if the results will serve no more useful purpose than the satisfying of personal curiosity as to the cause of death.

However, if the animal or animals dying under suspicious circumstances are from a herd or flock, it is felt that analysis is justified. The information gained may be used to save the other animals.

The outlines of several of the poison cases handled by the Control Service during the past year are given here. It is believed that they will be of interest to the farmers, feed dealers and manufacturers. One of the most baffling cases encountered occurred in Rhode Island in the summer of 1950. Although this Control Service was only indirectly concerned, it is reported here because of the several unusual and intriguing aspects.

A dairyman owning about 50 head of valuable stock suffered the loss of 14 cows. The herd was all kept in the same barn. All the animals had access to the same pasture and all received the same brand of feed. The cows were kept in three rows in the barn. The water to all rows was conducted by the same pipe.

With no previous symptoms of sickness the cows in one row began to die. Within about a week's time 14 cows, all from the same row, were dead. The cows in the other two rows were not even sick. The feed was suspected. It appears that the man feeding the cows was not able to lift a whole bag of feed. Therefore, it was his practice to dump the top third of a bag into a container and feed this portion to the first row. The middle third of the bag was fed to the next row, and the bottom third to the last row. Apparently this procedure was always followed and the last row, in which the cows died, always received the feed from the bottom third of the bag.

It was reasoned by the dairyman that there was a toxic ingredient present in the feed and that this ingredient sifted to the bottom of each of the bags of feed used. There are obvious flaws in this line of reasoning. Apparently whatever killed the cows was a strong poison. It seems unlikely that if this poison were present in the feed it would sift down to the bottom third of each bag so thoroughly that there would be an insufficient quantity remaining in the upper two-thirds to make the other cows just slightly sick.

However, this possibility, as well as others, was explored thoroughly by the Rhode Island State Chemist and his associates. The remaining feed was analyzed and fed to other animals. The stomach contents of the dead cows were fed to swine and the liver of one dead cow was fed to a cat. Some of the viscera were fed to fish. In all these tests negative results were obtained. The Federal Food and Drug Administration entered the case some time later and took samples from the dead animals. So far as is known here, the Federal agency found no conclusive evidence regarding the cause of the death of the 14 cows.

Some time after the cows died, a telephone call was received here from the owner of a large Massachusetts trout hatchery. He stated that he had fed the livers from the Rhode Island cows to his trout and that within one hour thousands of the trout were dead. He stated further that the viscera of the cows had been tested for all possible metallic poisons with negative results, and requested the Control Service to make tests for Parathion and DDT. This was done, with negative results.

Some of the muscle tissue and heart received here was fed to trout in an experimental pool containing 12 trout at a trout hatchery. The feeding was continued for 8 days and the trout were kept in the experimental pool after the eighth day to observe any delayed effects. On the tenth day one trout was found dead. On the twelfth day three more trout were dead. It was observed on this day that several trout had disappeared. According to the man in charge of the hatchery the trout probably were taken by rats, since this had happened before. Obviously the experimental pool should have been covered by a wire screen. Because of this it was concluded that the trout found dead might have died as the result of encounters with rats. The test was therefore considered inconclusive.

The Official Chemist discussed this case in May, 1951, with the representative of the feed manufacturer whose feed was used. At that date the case was still unsolved.

In another case a very complete and informative report was received from a veterinarian in Great Barrington regarding the death of two cows in a pasture and the serious illness of three heifers. The veterinarian gave complete details of the symptoms and results of post mortem examination. He stated that an empty can of weed killer was found and that grass along the fence had been killed apparently by a weed killer. A sample of the soil under the grass, the can containing the weed killer, and the rumen contents of the dead cows were submitted.

Enough material remained in the can to identify it as sodium arsenite. The soil contained the equivalent of 5,850 parts per million of sodium arsenite. The rumen contents contained well over 100 parts per million of arsenic.

Two heifers belonging to a resident of Westport Harbor died under suspicious circumstances. The stomach contents of one heifer were received for analysis. An unusually large amount of arsenic and copper was found, indicating Paris green poisoning.

In another case nitrate was suspected as the cause of the death of a cow. No significant amount of nitrate was found, but 22 parts per million of lead was present with no arsenic. This indicated paint poisoning.

A sample of barn sweepings was received from a veterinarian in Concord who suspected sodium nitrate or lead as the cause of the death of a cow. A large amount of lead arsenate was found in the sweepings.

A case referred to the Control Service by the Veterinary Science Department of the University involved the death of two cows that apparently had eaten away a considerable portion of the insulation covering a steam pipe. The rumen contents and the livers contained lead ranging from 2 to 8 parts per million. Although higher than normal, this quantity of lead is less than usually found in lead poisoning cases. No arsenic was present. The rumen contents of one cow were decidedly alkaline.

The pipe covering was found to consist mainly of asbestos, magnesium carbonate and magnesium oxide. It contained approximately 3 percent of a water

soluble alkali mainly as sodium hydroxide, which is a strong caustic. This was possibly a combination of paint and caustic poisoning.

In two other cases referred by the Veterinary Science Department, one involving the death of two animals, the other the death of one animal, lead was found in amounts ranging from 10 to 22.5 parts per million. Since no arsenic was present, paint poisoning was indicated.

A case, also referred by the Veterinary Science Department, involved the death of chinchillas: 43 parts per million of zinc and 8.1 parts per million of lead were found in the livers.

Two samples were received from the Entomology Department of the University. One consisted of a large number of dead bees, the other consisted of the hearts and livers of two robins. Death in both cases was thought to be due to DDT spray. The bees were found to contain 62.5 parts per million of DDT. The composite sample of the hearts and livers of the robins contained 120 parts per million of DDT.

Other samples were received during the year in which no significant quantities of the toxic elements for which tests were made were found.

Most of the cases handled by the Control Service have been with the help and advice from members of the University's Veterinary Science Department. The information furnished by these members has made possible the avoidance of a great deal of unnecessary analytical work.

Brands Substantially Complying with Guarantees

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Acme-Evans Co., Inc.			
Acme Wheat Standard Middlings with Screenings.....	1	Beacon Sweet "20".....	1
Allied Mills, Inc.		Beacon Breeders Mash.....	1
June Pasture.....	1	Beacon Broiler Feed.....	1
Sugarine 16% Dairy Feed.....	2	Beacon Calf Grain.....	1
Sugarine Special 16% Dairy Feed...	1	Beacon C-C Pellets.....	1
Wayne All Mash Egg.....	1	Beacon Complete Starter.....	1
Wayne All Mash Grower.....	1	Beacon Duck Grower.....	1
Wayne Breeder Mash.....	1	Beacon "22" Egg Mash.....	1
Wayne Calf Meal.....	1	Beacon Fleshing Pellets.....	1
Wayne Calf Starter.....	1	Beacon Goat Ration.....	1
Wayne Chick Starter.....	1	Beacon "18" Growing Mash.....	1
Wayne 20% Dairy Ration.....	1	Beacon Hog Feed.....	1
Wayne 16% Dairy Ration.....	1	Beacon Market Egg All-Mash.....	1
Wayne Egg Mash.....	1	Beacon Poultry Fitting.....	1
Wayne Fitting Ration.....	1	Beacon Test Cow Ration.....	1
Wayne Flushing Mash.....	1	Beacon Turkey and Game Bird Breeder.....	1
Wayne Growing Mash.....	1	Beacon Turkey & Game Bird Fitting	1
Wayne Horse Feed.....	1	Beacon Turkey and Game Bird	1
Wayne 16% Milk Producer.....	1	Be-Co-Lass.....	1
Wayne Pork Maker.....	1		
Wayne Rabbit Ration.....	1	E. H. Beer & Co., Inc.	
Wayne Turkey Starter.....	1	Beerco High Fat Yellow Hominy Feed.....	1
American Maize-Products Co.			
Cream of Corn Gluten Feed.....	1	Blatchford Calf Meal Co.	
Arcady Farms Milling Co.		Blatchford Calf Meal.....	1
Arcady 85% Grain Horse Feed.....	1	V-D.....	1
Arcady Laying Mash.....	1		
Rockland Guinea Pig Diet.....	1	Borden Grain Co.	
Rockland Mouse Diet.....	1	Borden's Dairy Feed.....	1
Rockland Rabbit Ration.....	1	Borden's Growing Feed.....	1
Rockland Rat Diet Complete.....	1	Borden's Laying Mash.....	1
Wonderfat Station Feed 14%.....	1	Borden's Super Starter Feed.....	1
		Borden's Sweet 16 Dairy.....	1
Archer-Daniels-Midland Co.			
Archer Quality 32% Protein Expeller Linseed Oil Meal.....	1	Brown-Forman Distillers Corp.	
		BF Corn Distillers Light Grains....	1
Ashcraft-Wilkinson Co.			
*Cow-Eta Brand 41% Protein Cottonseed Meal.....	1	George B. Brown Corp.	
		Brown's Dairy Feed.....	1
E. W. Bailey & Co.		Brown's Egg Mash.....	1
Pennant Brand Calf Ration.....	1	Brown's Growing Mash.....	1
Pennant Brand Complete Egg Ration	1	Brown's Pig Feed.....	1
Pennant Brand 16% Dairy Ration...	1		
Pennant Brand Horse Feed.....	1	Brown Linseed Corp.	
Pennant Brand Pig Feed.....	1	Briarcliff Farms Brand 32% O.P. Linseed Meal.....	3
Pennant Brand Stock Feed.....	1		
Barber & Bennett, Inc.		S. J. Cherry & Sons, Ltd.	
15% Pasture Ration.....	1	Wheat Bran.....	1
Fort Orange Dairy Ration.....	1	Wheat Shorts.....	1
Fort Orange Dry and Freshening Ration.....	1		
Fort Orange 12% Fitting and Calf Grain Ration.....	1	Clinton Foods, Inc.	
Fort Orange Golden Test Ration....	1	Clinton Corn Gluten Feed.....	1
Fort Orange Horse Feed.....	1		
Fort Orange Laying Mash.....	1	Community Service, Inc.	
Fort Orange Pig & Hog Feed.....	1	Community Complete Pig Feed.....	1
Fort Orange 15% Test Ration.....	1	Community 18% Dairy Ration.....	1
Fort Orange Turkey Grower.....	1	Community 16% Dairy Ration.....	1
		Community Fitting Ration.....	1
Beacon Milling Co., Inc.		Community Growing Mash.....	1
Auburn "20".....	1	Community Laying Mash.....	1
Auburn "16".....	1	Community Starter & Grower Mash	1
Beacon "20".....	1		
		Consolidated Products Co.	
		Kaff-A.....	1
		Consolidated Rndering Co.	
		*Corenco Bone Meal.....	1
		Corenco Fish Meal 60%.....	2

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Consolidated Rendering Co.—(Continued)		Dailey Mills, Inc.	
Corenco Fish Meal 58%.....	1	Double Diamond Complete Egg Producer.....	2
Corenco 45% Meat & Bone Scrap...	3	Double Diamond Complete Grower.....	1
Copeland Flour Mills, Ltd.		Double Diamond Complete Layer...	1
Dandy Wheat Bran.....	1	Double Diamond Horse Feed.....	2
Dandy Wheat Shorts.....	1	Double Diamond 16% Milk Producer	2
Corn Products Refining Co.		Double Diamond Pig & Hog.....	2
Buffalo Brand Corn Gluten Feed....	1	Double Diamond Hical Body Builder	2
Diamond Brand Corn Gluten Meal..	1	Double Diamond Hical Rabbit Pellets	1
Courcy & Sons Grain Co.		Double Diamond Hical 16% Test Ration.....	3
Courcy's Growing Mash.....	2	Double Diamond Hical Turkey Starter	1
Courcy's Laying Mash.....	2	Dawe's Manufacturing Co.	
Cover Grain & Feed Co.		Dawe's Broiler Base.....	1
C & P Grade A Laying Mash.....	1	Delaware Mills, Inc.	
C & P Growing Mash.....	1	Delaware Sweet 16% Dairy Feed...	1
C & P Pig & Hog Feed.....	1	Derwood Mills, Inc.	
Chas M. Cox Co.		Derwood Horse Crunch.....	1
Utility 20 Dairy Ration.....	1	Dietrich & Gambrill, Inc.	
Wirthmore Breeder Mash.....	1	D & G All Mash Turkey Starter....	1
Wirthmore Calving Ration.....	1	D & G All-Purpose Mash.....	1
Wirthmore Complete Breeder Ration	1	D & G Breeder Mash.....	1
Wirthmore Complete Egg Ration....	1	D & G Broiler Mash.....	1
Wirthmore Complete Growing Ration	1	D & G Fleshing Mash.....	1
Wirthmore 20 Dairy Ration.....	1	D & G Growing & Fitting Ration...	1
Wirthmore 16 Dairy Ration.....	1	D & G Special Broiler Mash.....	1
Wirthmore Fattening Pellets.....	1	D & G Turkey Growing Mash.....	1
Wirthmore 14 Fitting Ration.....	1	Frederick 16% Dairy.....	1
Wirthmore Fodder Greens.....	1	Frederick Laying Mash.....	1
Wirthmore Growing Mash.....	2	Gambrill's Chick Starter.....	1
Wirthmore Hi-Ener-G Starter & Broiler Ration.....	1	Gambrill's Growing Mash.....	1
Wirthmore Horse Feed.....	1	Gambrill's Laying Mash.....	1
Wirthmore Laying Mash.....	2	Pen Mar Horse & Stock Feed.....	1
Wirthmore Mornin' Call Scratch Feed	1	J. L. Dunnell & Son	
Wirthmore Pig and Hog Feed.....	1	Excel 18% Dairy Ration.....	1
Wirthmore Poultry Fitting.....	1	Excel Fitting Ration.....	1
Wirthmore Poultry Flush.....	1	Excel Laying Mash.....	1
Wirthmore Producer 20 Dairy.....	1	Horse Feed.....	1
Wirthmore Rabbit Pellets.....	1	Starter and Grower—Horner's.....	1
Wirthmore 20 Record Ration.....	1	East Longmeadow Grain Store	
Wirthmore 16 Record Ration.....	1	Blue Ribbon All Mash Grower.....	1
Wirthmore Sheep & Goat Ration....	1	Blue Ribbon All Mash Layer.....	1
Wirthmore Starter and Broiler.....	1	Blue Ribbon Chick Starter & Broiler Mash.....	1
Wirthmore Stock Feed.....	1	Blue Ribbon 16% Dairy.....	1
Wirthmore Super Pellets.....	1	Blue Ribbon Pig & Hog Feed.....	1
Wirthmore Turkey Fattening Ration	1	Eastern States Farmers' Exchange, Inc.	
Wirthmore Turkey Growing Ration..	1	Eastern States All-Mash Developer	1
Wirthmore Twin-Mix Calf Ration....	1	Eastern States All-Mash Producer..	1
Crawford Brothers, Inc.		Eastern States Calf Starter.....	1
Crawford Complete Egg Mash.....	1	Eastern States Fitting Ration.....	1
Crawford Complete Growing Mash..	1	Eastern States Fulpaal.....	1
Crawford Dry-Freshening.....	1	Eastern States Horse Feed.....	1
Crawford Fitting Ration 14%.....	1	Eastern States Milkmore.....	1
Crawford Growing Mash.....	1	Eastern States Pig Starter & Breeder	1
Crawford Horse Feed.....	1	Eastern States Pork Builder.....	1
Crawford Laying Mash.....	1	Eastern States Producer.....	1
*Crawford Producer 20%.....	1	Eastern States 32% Supplement.....	1
Crawford Special Test 16%.....	2	Eastern States Sweepstakes.....	1
Crawford Starter & Broiler Mash....	1	Eastern States Turkey-Grower.....	1
Curley Grain & Fuel Co.		B. A. Eckhart Milling Co.	
Crystal 20% Breeder Mash.....	1	Ecko Pure Wheat Bran.....	1
Crystal 15% Complete Growing Mash	1	Standard Wheat Middlings with Ground Released Wheat Screenings	1
Crystal 16% Complete Laying Mash..	1		
Crystal 18% Growing Mash.....	1		
Crystal 20% Laying Mash.....	1		

* See also table of "Brands Not Conforming to Guarantees."

INSPECTION OF COMMERCIAL FEEDSTUFFS

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Elmore Milling Co., Inc.		Ferneau Grain Co.	
Elmore Breeder Mash.....	1	F Corn Distillers Dried Grains.....	1
Elmore Bull Feed.....	1		
Elmore Complete Broiler Ration.....	1	Flory Milling Co., Inc.	
Elmore Complete Growing Ration.....	1	Flory All-Mash Layer.....	1
Elmore Complete Market Egg Mash.....	1	Flory Broiler Mash.....	1
Elmore Complete Rabbit Ration.....	1	Flory 16% Dairy Feed.....	1
Elmore Crate Fattener.....	1	Flory 16% Grower Mash.....	1
Elmore Dry and Freshening Ration.....	1	Flory Hi N-er-G Broiler Mash.....	1
Elmore Egg Mash.....	1	Flory Layer Mash.....	1
Elmore Fitting Ration.....	1	Flory Starter Mash.....	1
Elmore Flaked Pelleted Calf Starter.....	1	Flory Superior 16% Dairy Feed.....	1
Elmore Goat Ration.....	1	Flory Superior 14% Fitting Ration.....	1
Elmore Grand Champion Ration.....	1	Flory Turkey and Poultry Fitting Feed.....	1
Elmore Growing Mash.....	1	Golden Egg Layer Mash.....	1
Elmore Horse Feed.....	1		
Elmore Improved Calf Starter.....	1	General Mills, Inc.	
Elmore M.A.C. Laying Mash.....	1	Washburn's Gold Medal Hard Wheat Standard Screenings and Ground Wheat Screenings not exceeding mill run.....	1
Elmore Milk Grains "Twenty".....	1		
Elmore Poultry Fitting Ration.....	1	General Mills, Inc., Farm Service Division	
Elmore Test Ration.....	1	Farm Service 19% Broiler Mash.....	1
Elmore Turkey Finisher (Fattener).....	1	Farm Service 20% Dairy Feed.....	1
Elmore Turkey Growing Mash.....	1	Farm Service 16% Dairy Feed.....	1
		Farm Service 15% Coarse Dairy Feed.....	1
John W. Eshelman & Sons		Farm Service 14% Fitting Ration.....	1
Conestoga 20 Dairy Feed.....	1	Farm Service 18% Grower Mash.....	1
Pennsy 16 Dairy Feed.....	1	Farm Service Horse Feed.....	2
Pennsy Laying Mash.....	1	Farm Service 18% Layer Mash.....	1
Red Rose Breeder Mash.....	1	Farm Service Turkey Fattener-Finisher Mash.....	1
Red Rose Calf Grower.....	1	Farm Service Turkey Grower Mash.....	1
Red Rose Complete Laying Mash.....	1	Vigor 20% Dairy Feed.....	1
Red Rose 18 Dairy Feed.....	1	Vigor Stock Feed.....	1
Red Rose 16 Dairy Feed.....	1		
Red Rose Fitting Ration.....	1	General Mills, Inc., Larrowe Division	
Red Rose Horse Feed.....	1	Dried Molasses-Beet Pulp.....	2
Red Rose Laying Mash.....	1	Larro Broiler Feed.....	1
Red Rose Rabbit Feed Pellets.....	1	Larro Calf Builder.....	1
Red Rose 14% Test-Cow Ration.....	1	Larro Chick Builder.....	1
		Larro 20% Dairy Feed.....	1
Essex County Co-operative Farming Assn.		Larro 16% Dairy Feed.....	2
S-X All-Mash Breeder.....	1	Larro Egg Mash.....	2
S-X All-Mash Egg.....	1	Larro Green Pellets for Rabbits.....	1
S-X All-Mash Growing.....	1	Larro 40% Hog Concentrate.....	1
S-X Breeder Mash.....	1	Larro Poultry Breeder Mash.....	2
S-X 18% Dairy Ration.....	1	Larro Sow and Pig Builder.....	1
S-X Egg Mash.....	1	Larro Turkey Builder.....	1
S-X 14% Fitting Ration.....	1	Larro Turkey Finisher.....	1
S-X Growing Mash.....	1		
*S-X Starter and Broiler.....	1	Glidden Co., Feed Mill Division	
*S-X Starter and Broiler Connecticut Formula.....	1	Glidden Breeder Mash.....	1
		Glidden Broiler Ration.....	1
Excelsior Milling Co.		Glidden Growing Mash.....	1
Camel Wheat Mixed Feed.....	2	Glidden Laying Mash.....	1
		Glidden Super Broiler Ration.....	1
Farm Bureau Assn.			
Farm Bureau Breeder Mash.....	1	Gloucester By-Products, Inc.	
Farm Bureau Chick Starter Mash.....	1	Globpro Brand Fish Meal.....	1
Farm Bureau Complete Market Egg Mash.....	2		
Farm Bureau Conditioner Mash.....	1	D. H. Grandin Milling Co.	
Farm Bureau Dairy 20%.....	1	Grandin's All-Mash Grower.....	1
Farm Bureau Dairy 18%.....	1	Grandin's All-Mash Layer.....	1
Farm Bureau 16% Dairy Ration.....	2	Grandin's 14 Fitting Ration.....	1
Farm Bureau Developer Mash.....	1	Grandin's Goat Feed.....	1
Farm Bureau High Energy Broiler and Starter Mash.....	1	Grandin's Horse Feed.....	1
Farm Bureau Horse Feed.....	1	Grandin's Laying Mash.....	1
Farm Bureau Market Egg Mash.....	1	Grandin's 20 Milk Maker.....	1
Farm Bureau Rabbit Food Pellets.....	1		
Farm Bureau Turkey Grower.....	1		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
D. H. Grandin Milling Co.—(Continued)			
Grandin's 16 Milk Maker.....	1	Kasco Complete Rabbit Ration.....	1
Grandin's Pig and Hog Feed.....	1	Kasco Egg Producer.....	1
Grandin's Poultry and Turkey Fitting Ration.....	1	Kasco Fitting Ration.....	1
Grandin's Start-To-Finish Mash.....	1	Kasco Growing Mash.....	1
Grandin's Stock Feed.....	1	Kasco Horse Feed.....	1
Grandin's 18 Test Ration.....	1	Kasco Poultry Greens and Grains.....	1
Grandin's Turkey Starter.....	1	Kasco Sweet 16% Dairy Feed.....	1
Hales & Hunter Co.		Kellogg Co.	
Pioneer Calf Starter.....	1	Kellogg's Hominy Feed.....	1
Pioneer 15 Dairy.....	1	Spencer Kellogg & Sons, Inc.	
Pioneer Pelleted Flaked 15 Dairy.....	1	Kellogg's 34% Old Process Linseed Oil Meal.....	1
Pioneer Dairy Bull.....	1	Kronick's Coal & Grain Co.	
Pioneer Dry & Freshening.....	1	Kronick's Dairy Ration 16%.....	1
Pioneer Horse Feed.....	1	Kronick's Egg Mash.....	1
Red Comb Broiler Mash.....	1	Mackenzie & Winslow, Inc.	
Red Comb Crate Fattener.....	1	Money's Worth Complete Growing.....	1
Red Comb Egg Mash.....	1	Money's Worth Complete Mash.....	1
D. Harbeck & Sons		Money's Worth Dairy Feed 20%.....	1
Welcome Dairy Feed.....	1	Money's Worth Fitting Ration.....	1
Welcome Egg Mash.....	1	Money's Worth Growing Mash.....	1
Welcome Growing Mash.....	1	Money's Worth Laying Mash.....	1
Welcome Starter and Broiler Mash.....	1	Money's Worth Starter.....	1
Harper Feed Mills, Inc.		Money's Worth Turkey Fattener.....	1
Exchange Laying Mash.....	1	Maple Leaf Milling Co.	
*Harco Breeder Mash.....	1	Rex Wheat Bran with Screenings not exceeding mill run.....	1
Harco Broiler Mash.....	1	*Rex Wheat Middlings with Screenings not exceeding mill run.....	1
Harco Complete Growing Ration.....	1	Maritime Milling Co., Inc.	
Harco Complete Starting and Growing Ration.....	1	B-B Broiler Ration.....	1
Harco 20% Dairy Ration.....	1	B-B Complete Growing Ration.....	1
Harco Dairy Fitting Ration.....	2	B-B Complete Laying Ration.....	1
Harco Finisher Pellets.....	1	B-B Conditioning Mash.....	1
*Harco Laying Mash.....	2	Sweetened Bull Brand 18% Special Dairy Ration.....	1
Harco Laying & Breeder Mash.....	1	Sweetened Bull Brand "16" Dairy Ration.....	1
Harco Pig and Hog Meal.....	1	Bull Brand Dry and Fresh Cow Fitting Ration.....	1
Harco Rabbit Feed.....	1	B-B Growing Mash.....	1
Harco Range Growing Mash.....	1	B-B Ma-Co High Energy Breeder Mash.....	1
Harco Test Cow Ration.....	2	B-B Ma-Co High Energy Broiler Ration.....	1
Henkel Flour Mills Division, International Milling Co.		B-B Ma-Co High Energy Complete Breeder Ration.....	1
Henkel's Wheat Red Dog.....	1	B-B Ma-Co High Energy Complete Laying Ration.....	1
Henkel's Wheat Standard Middlings.....	1	B-B Ma-Co High Energy Growing Mash.....	1
Hubinger Co.		Hi-Test Dairy Feed 20% Pro.....	1
KeOkuk Brand Corn Gluten Feed..	1	Marmico 16% Protein Dairy Feed..	1
International Milling Co.		Methuen Grain Co.	
Blackhawk Wheat Bran with Ground Wheat Screenings not exceeding 8%.....	1	Empire All-Mash Grower.....	1
Blackhawk Wheat Standard Middlings with Ground Wheat Screenings not exceeding mill run.....	1	Empire All-Mash Layer & Breeder..	1
Target Wheat Red Dog.....	1	Empire Egg Producer.....	1
Jaquith & Co.		Empire Starter-Broiler.....	1
Jaquith 20% Dairy Ration.....	1	Geo. Q. Moon & Co., Inc.	
Jaquith Growing Mash.....	1	Moon's Complete Growing Mash... ..	1
Jaquith Laying Mash.....	1	Moon's Complete Laying Mash.....	1
Jaquith Starting Mash.....	1	Moon's Complete Starter and Broiler Mash.....	1
Kasco Mills, Inc.			
Kasco All Mash Breeder Ration....	1		
Kasco All-Mash Layer Ration.....	1		
Kasco Beatsall Milk Grains 20%.....	1		
Kasco Beatsall Milk Grains 16%.....	1		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Geo. Q. Moon, Co., Inc.—(Continued)		George H. Parker Grain Co.	
Moon's 24% Dairy Ration.....	1	Parker's Egg Mash.....	1
Moon's Fitting Ration.....	1	Parker's Growing Mash.....	1
Moon's Hog Feed.....	1	Parker's High A 16% Dairy Feed....	1
Moon's Horse Feed.....	1	Parker's High A 14% Fitting Ration..	1
Moon's Laying Mash.....	1	Parker's Special Starter & Broiler Mash.....	1
Moon's 16% Test Ration.....	1		
Moon's Turkey Fitting Ration.....	1	Parrish & Heimbecker, Ltd.	
Moon's Turkey Grower Mash.....	1	Parrheim Pure Wheat Shorts.....	1
N. E. Complete Growing Mash.....	1		
N. E. Complete Laying Mash.....	1	Pasco Packing Co.	
Special A 20% Dairy Ration.....	1	Sugar-Sweet Citrus Pulp.....	2
Special A 18% Dairy Ration.....	1		
Special A 16% Dairy Ration.....	1	Patent Cereals Co.	
U. S. 16% Dairy Ration.....	1	Hominy Feed.....	1
Jas. F. Morse & Co.		Perkins Oil Co.	
Morse's 50% Meat & Bone Scraps..	1	*Golden Rod Brand Cottonseed Meal	1
Morse's 45% Meat & Bone Scraps..	1		
Neumond Co.		Pilgrim Feed Co.	
Neumond's Distillers Dried Grains..	2	Pilgrim Advanced Registry 18% Test Ration.....	1
		Pilgrim Pullet Builder.....	1
Ogden Grain Co.		Pillsbury Mills, Inc.	
Cloverbloom Dairy Feed.....	1	Pillsbury's XX Daisy.....	1
Ogden "Biddy" Mash.....	1		
Ogden Complete Pellets.....	1	Pittsford Flour Mills, Inc.	
Ogden Complete Starter-Grower-Layer-Breeder.....	1	Saturn Wheat Middlings with Screenings mill run.....	1
Ogden 16% Dairy Feed.....	1		
Ogden Fitting Ration.....	1	R. C. Pratt & Co., Ltd.	
Ogden Growing Mash.....	1	Ruler Brand Pure Wheat Bran.....	1
Ogden Horse Feed.....	1		
Ogden Layer & Breeder.....	1	Publicker Industries, Inc.	
Ogden Pig Feed.....	1	30% Grain Sorghum Distillers Dried Grains.....	1
Ogden Rabbit Pellets.....	1		
Ogden Turkey Grower and Developer	1	Quaker Oats Co.	
		Bell Cow Wheat Bran.....	1
Ogilvie Flour Mills Co., Ltd.		Ful-O-Pep 32% Dairy Concentrate..	1
Ogilvie Wheat Bran.....	1	Ful-O-Pep 16% Dairy Ration.....	1
Ogilvie Wheat Shorts.....	1	Ful-O-Pep Egg Breeder Mash.....	1
		Ful-O-Pep Egg Ration.....	1
Palm Grain Co.		Ful-O-Pep Fitting Ration.....	1
Palm's Complete Mash.....	1	Ful-O-Pep Growing Ration.....	1
		Ful-O-Pep Horse Feed.....	1
Park & Pollard Co., Inc.		Ful-O-Pep Laying Mash.....	1
Lay or Bust All Mash Grower.....	1	Ful-O-Pep Milking Ration.....	1
Lay or Bust All Mash Layer.....	1	Ful-O-Pep Pig-N-Sow Feed.....	1
Lay or Bust Breeder Mash.....	1	Ful-O-Pep Super Greens.....	1
Lay or Bust Broiler Mash.....	1	Peterborough Oat Feed.....	1
Lay or Bust Chick Starter.....	1	Quaker 20% Protein Dairy Ration..	1
Lay or Bust Duck Fattener.....	1	Quaker 16% Protein Dairy Ration..	1
Lay or Bust Egg Mash.....	1	Quaker Sugared Schumacher Feed Coarse.....	1
Lay or Bust Fleshing Pellets.....	1		
Lay or Bust Growing Feed.....	2	Quebec Sugar Refinery	
Lay or Bust Hi-Value Scratch Pellets	1	Dried Beet Pulp.....	1
Lay or Bust Laying Pellets.....	1		
Lay or Bust Poultry Fitting Ration	1	Ralston Purina Co.	
Lay or Bust Turkey Grower.....	1	Northeastern Special Dairy 16%....	2
Milk Maid Bulky Sweet Dairy.....	1	Purina B & M Cow Chow.....	1
Milk Maid 20% Dairy Ration.....	1	Purina Broiler Checkers Supplement	1
Special Milk-Maid 20% Ration.....	1	*Purina Broiler Chow (Special).....	2
Special Milk-Maid 16% Dairy.....	1	Purina Calf Chow.....	1
Milk Maid Fitting Ration.....	1	Purina Calf Startena.....	1
Milk Maid Test Cow Ration.....	1	Purina Chick Growena.....	1
Park & Pollard Go-Tu-It Pig & Hog Ration.....	1	Purina Chick Startena.....	1
Park & Pollard Rabbit Pellets.....	1	Purina Chicken Fatena Checkers....	3
Red Ribbon 20% Dairy Ration.....	1	Purina Commercial Lay Chow.....	1
Red Ribbon 18% Dairy Ration.....	1	Purina Commercial Layena.....	2
Red Ribbon 16% Dairy Ration.....	1		
Red Ribbon Fitting Ration.....	1		
Yankee Horse Feed.....	1		

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Ralslon Purina Co.—(Cont.)		Tioga Mills, Inc.	
Purina D & F Chow.....	2	Ti-O-Ga 20% Dairy Feed.....	1
Purina Duck Growena.....	1	Ti-O-Ga Dry-Fresh Dairy Feed.....	1
Purina Eastern Cow Chow.....	1	Union Starch & Refining Co.	
Purina Flock Chow.....	1	Union Corn Gluten Feed.....	1
Purina Fox Chow (Without Meat Meal).....	1	Union Corn Gluten Meal.....	2
Purina Game Bird Growing Chow.....	1	United Cooperative Farmers, Inc.	
Purina Goat Chow.....	1	UCF Breeder.....	1
Purina Hog Fatena.....	1	UCF Fitting Ration.....	1
Purina Layena (Complete Ration).....	1	UCF Grower.....	1
Purina Mink Chow.....	1	UCF Layer.....	1
Purina Omolene.....	1	UCF Milkmaker.....	1
Purina Poultry Breeder Checkers.....	1	UCF Turkey Finisher.....	1
Purina Rabbit Chow Checkers (Complete Ration).....	1	UCF Turkey Grower.....	1
Purina Turkey Breeder Chow.....	1	Universal Grain Co. of New Jersey	
Purina Turkey Breeder Layena (Complete Ration).....	1	Superior Cow Brand Dried Brewers Grains.....	
Purina Turkey Fatena.....	1	Valier & Spies Milling Co.	
Purina Turkey Growena.....	1	Valier's Wheat Bran.....	1
Purina Turkey Startena.....	1	Van Iderstine Co.	
Wheat Bran.....	1	Vico Steamed Bone Meal.....	1
John Reardon & Sons Division of Wilson & Co., Inc.		Ventura Grain Co.	
Edible Bone Meal.....	1	Every-Day Breeder Mash.....	1
D. F. Riley		Every-Day Dairy 22%.....	1
Riley's 16% Dairy Ration.....	1	Every-Day 20% Dairy.....	2
Riley's 18% Growing Mash.....	2	Every-Day 16% Dairy.....	2
Riley's 18% Laying Mash.....	2	Every-Day 14% Dairy & Fitting.....	1
Russell-Miller Milling Co.		Every-Day Grower.....	2
Hard Wheat Occident Standard Middlings with Ground Screenings not exceeding mill run.....	1	Every-Day Starter & Broiler.....	2
Ryther & Warren Co.		Every-Day Turkey Starter-Grower.....	1
Blue Tag Dairy Ration.....	1	Ventura Laying Mash.....	2
Minot Growing Mash.....	1	O. B. Vunck & Son	
St. Lawrence Flour Mills Co., Ltd.		Cortland Growing Mash.....	2
Premier Wheat Bran.....	1	Cortland Laying Mash.....	2
Schenley Distillers, Inc.		Cortland Rabbit Pellets.....	2
Schenley Corn Distillers Dried Grains with Solubles.....	1	Cortland Starter Mash.....	1
Joseph E. Seagram & Sons, Inc.		Cortland Starter-Broiler Mash.....	1
Seagrams Corn Distillers Dried Solubles.....	1	*Cortland Supreme Ration 20%.....	1
Sherwin Williams Co.		Cortland Supreme Ration 15%.....	2
Sherwin-Williams 34% Pure Linseed Oil Meal.....	1	Hiram Walker & Sons, Inc.	
Stratton & Co.		Corn Distillers' Dried Grains with Solubles.....	1
Fancy Wheat Bran with Mill Run Wheat Screenings.....	1	C. P. Washburn Co.	
Standard Wheat Middlings with Ground Screenings not exceeding mill run.....	1	Made Right Breeder.....	1
Wheat White Middlings.....	1	Made Right Complete Broiler.....	1
Wheat Mixed Feed with Wheat Screenings not exceeding mill run.....	1	Made Right Complete Growing Feed.....	1
"S & Co's" Stock Feed.....	1	Made Right Complete Layer.....	2
Taunton Grain Co.		Made Right 20% Dairy.....	1
Balanced Ration.....	1	Made Right 16% Dairy.....	1
Fitting Ration.....	1	Made Right Fitting.....	1
Growing Mash.....	1	Made Right Growing Feed.....	1
Laying Mash.....	1	Made Right Horse Feed.....	1
Winneconnet Turkey Growing.....	1	Made Right Laying Mash.....	1
		Made Right Starting Feed.....	1
		Made Right Stock Feed.....	1
		Made Right Turkey Grower.....	1
		H. K. Webster Co.	
		Blue Seal All-Mash Breeder's Ration ..	1
		Blue Seal All-Mash Egg Ration.....	1
		Blue Seal All-Mash Growing Ration.....	1
		Blue Seal Breeder's Nash.....	1
		Blue Seal Calf Grower.....	1
		Blue Seal Calf Starter.....	1

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Concluded

Manufacturer and Brand	Number of Samples Analyzed		
H. K. Webster Co.—(Continued)		Wirthmore Grain Co.	
Blue Seal "20" Dairy Ration Coarse.	1	Preferred Complete Growing Ration.	2
Blue Seal Fine "20" Dairy Ration	1	Preferred Complete Laying Ration..	2
Blue Seal "16" Dairy Ration Coarse	1	Preferred Growing Mash.....	2
Blue Seal Fine "16" Dairy Ration..	1	Preferred Laying Mash.....	2
Blue Seal Economizer "16" Dairy Ration.....	1	Wood's Stock Feed.....	2
Blue Seal Egg Mash.....	1	Yantic Grain and Products Co.	
Blue Seal Fattening Pellets.....	1	Big Y 20% Dairy Ration.....	1
Blue Seal Fitting Ration.....	1	Big Y 16% Dairy Ration.....	1
Blue Seal Goat Feed.....	1	Big 20% Laying Mash.....	1
Blue Seal Growing Mash.....	1	Yieldmor Feeds, Inc.	
Blue Seal Horse Feed.....	1	Central All-Mash Egg Mash.....	1
Blue Seal Pig Feed.....	1	Central Chick Starter.....	1
Blue Seal Stock Feed.....	1	Central Sweet 20% Dairy Feed.....	1
Blue Seal Succulent Feed.....	1	Central 20% Egg Mash.....	1
Blue Seal Super Mash.....	1	Central Growing Mash.....	2
Blue Seal Super Starter and Broiler.	1	Yieldmor All-Mash Egg Mash.....	1
Blue Seal Test Ration.....	1	Yieldmor Broiler Feed.....	2
Blue Seal Turkey Growing.....	1	Yieldmor Growing Mash.....	1
Wessel, Duval & Co., Inc.		*Yieldmor Hi-Energy Broiler Ration.	1
Imported Dried Beet Pulp.....	1	Yieldmor 18% Sow & Pig Feed....	2
Whitmoyer Laboratories, Inc.		Yieldmor Sweet Feed.....	1
Whitmoyer Quality Fish Meal.....	1	Yieldmor Turkey Grower.....	1
Wilson's Corn Products, Inc.		Yieldmor Turkey Starter.....	1
Wilson Hominy Feed.....	1		

Brands Not Conforming to Guarantees

This table includes brands that are one percent or more under guarantee in protein or fat or are one and one-half percent or more over guarantee in fiber.

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	
Ashcraft-Wilkinson Co. *Cow-Eta Brand 41% Protein Cottonseed Meal.....	38.4	41.0	4.7	4.0	13.4	13.0	6.0
Canada Linseed Oil Mills, Ltd. Maple Leaf 36% Protein Pure Linseed Oil Cake Meal.....	34.7	36.0	4.8	3.5	9.2	8.5	5.4
Connecticut Grains Corp. Dried Brewers Grains.....	23.8	25.0	7.4	7.0	15.5	13.0	3.6
Consolidated Rendering Co. *Corenco Bone Meal..... Corenco 50% Meat & Bone Scrap.....	24.5 48.5	20.0 50.0	0.9 11.3	2.0 6.0	— —	— —	63.5 29.2
Chas. M. Cox Co. Utility 16 Dairy Ration.....	17.3	16.0	4.3	2.5	14.7	13.0	7.3
Crawford Brothers, Inc. *Crawford Producer 20%..... Crawford Rabbit Pellets.....	21.9 16.6	20.0 16.0	2.6 4.5	4.0 3.0	9.5 14.3	10.0 9.0	10.8 6.7
Elmore Milling Co., Inc. Elmore Fleshing Pellets.....	19.4	15.0	5.0	4.0	7.9	6.0	7.7
Essex County Co-operative Farming Assn. *S-X Starter and Broiler..... *S-X Starter and Broiler Connecticut Formula..... S-X Starter and Broiler Connecticut Formula.....	16.6 16.6 19.0	20.0 20.0 20.0	4.1 4.3 4.7	4.0 4.0 4.0	5.3 3.7 4.2	6.5 4.5 4.5	6.8 5.9 6.1
General Mills, Inc., Farm Service Div. Vigor 16% Dairy Feed.....	16.8	16.0	3.2	3.0	13.8	12.0	8.6
Harper Feed Mills, Inc. †Harco Breeder Mash..... †Harco Laying Mash.....	17.2 17.5	22.0 20.0	3.5 3.8	3.0 3.0	5.2 5.1	6.5 7.5	6.9 6.7
Kronick's Coal & Grain Co. Kronick's Starter-Grower Mash.....	21.2	20.0	5.4	4.5	8.3	6.5	9.4
Kuder Citrus Pulp Co. Kuder Dried Citrus Pulp.....	6.0	6.0	3.1	5.0	11.1	13.0	5.0
Mackenzie & Winslow, Inc. Money's Worth Dairy Feed 16%.....	16.6	16.0	4.1	4.0	11.7	10.0	5.9
Maple Leaf Milling Co. *Rex Wheat Middlings with Screenings not exceeding mill run.....	15.0	16.0	5.6	5.0	7.0	9.0	4.4
Maritime Milling Co., Inc. ‡Sulfaquinoxaline Mixture incorporated in B-B Ma-Co High Energy Broiler Ration.....	20.7	22.0	5.0	3.0	3.6	3.9	4.8
Geo. Q. Moon & Co., Inc. Moon's Rabbit Pellets.....	17.2	15.0	4.1	2.5	11.5	10.0	7.5

Brands Not Conforming to Guarantees

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
George H. Parker Grain Co.							
Bill McHugh's Thoroughbred Horse Feed	13.4	15.0	4.4	4.0	7.2	10.0	5.5
Perkins Oil Co.							
*Golden Rod Brand Cottonseed Meal...	39.9	41.0	6.3	5.0	10.2	12.0	7.2
Quaker Oats Co.							
Vim Oat Mill Feed.....	2.5	3.5	1.1	1.0	35.8	34.0	6.8
Ralston Purina Co.							
Northeastern Special Dairy 18%.....	20.2	18.0	1.9	3.0	8.2	15.0	7.6
*Purina Broiler Chow (Special).....	18.9	22.0	4.3	3.5	3.9	4.5	7.1
Purina Cow Chow 18%.....	17.0	18.0	3.0	3.0	9.1	12.0	8.2
John Reardon & Sons Div. of Wilson & Co., Inc.							
Register Brand Fish Meal.....	58.6	60.0	14.0	5.0	—	—	21.7
Register Brand 45% Protein Meat and Bone Scrap.....	41.5	45.0	11.5	8.0	—	—	40.1
Ryther & Warren Co.							
Minot Egg Mash.....	16.7	18.0	4.2	4.0	7.4	8.0	6.1
Staley Milling Co.							
Hy-Power Hominy Feed.....	10.9	10.0	5.9	7.0	4.1	7.0	1.1
O. B. Vunck & Son							
*Cortland Supreme Ration 20%.....	17.2	20.0	4.1	4.0	9.2	10.0	7.4
Yieldmor Feeds, Inc.							
*Yieldmor Hi-Energy Broiler Ration....	17.4	20.0	2.4	3.0	4.9	4.5	7.5

* See also table of "Brands Substantially Complying with Guarantees."

† By mistake a lot of Harco Finisher Pellets was tagged with Laying Mash Pellets and Breeder Pellets labels. The manufacturer made proper rebate to customer. See also table of "Brands Substantially Complying with Guarantees."

‡ Sulfaquinoxaline found 0.0130%, guaranteed 0.0125%.

MEDICATED FEEDS

It will be noted that a considerable number of samples are below guarantee in the drugs for which guarantees are made. This is not due, always, to the fact that an insufficient amount of drug was used when the feed was mixed.

It has been found that it is impossible with the present methods of analysis to recover all the added drugs after the feed has been in storage only a relatively short period of time. This does not mean necessarily that there is an attendant loss of the drug's effectiveness in preventing disease. It may mean that the drug is incompletely extracted during analysis. Further, it is difficult to obtain uniform mixtures when as little as one-quarter of one pound of a drug is used per ton of feed. Therefore this Control Service considers at present that the drug guarantees are met if analysis shows the content to be within 20 per cent of that guaranteed.

Brands Containing Sulfaquinoxaline

These brands substantially complied with guarantees of protein, fat and fiber, except as noted.

Manufacturer and Brand	Sulfaquinoxaline	
	Found	Guaranteed
Allied Mills, Inc.		
Sulfaquinoxaline incorporated in Wayne All Mash Grower.....	0.0140	0.0125
Sulfaquinoxaline incorporated in Wayne Broiler Feed.....	0.0125	0.0125
Sulfaquinoxaline incorporated in Wayne Broiler Feed.....	0.0122	0.0125
Sulfaquinoxaline incorporated in Wayne Chick Starter.....	0.0162	0.0125
Sulfaquinoxaline incorporated in Wayne Chick Starter.....	0.0108	0.0125
Sulfaquinoxaline incorporated in Wayne Chick Starter.....	0.0130	0.0125
E. W. Bailey & Co.		
Sulfaquinoxaline mixed in Pennant Brand Chick Starter.....	0.0096	0.0125
Beacon Milling Co., Inc.		
Sulfaquinoxaline mixed with Beacon Complete Starter.....	0.0125	0.0125
Sulfaquinoxaline mixed with Beacon Complete Starter.....	0.0103	0.0125
Chas. M. Cox Co.		
Sulfaquinoxaline mixed with Wirthmore Complete Growing Ration.....	0.0125	0.0125
Sulfaquinoxaline mixed with Wirthmore Complete Growing Ration.....	0.0114	0.0125
Sulfaquinoxaline mixed with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0125	0.0125
Sulfaquinoxaline mixed with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0100	0.0125
Sulfaquinoxaline mixed with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0142	0.0125
Sulfaquinoxaline mixed with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0205	0.0125
Sulfaquinoxaline mixed with Wirthmore Hi-Ener-G Starter and Broiler Ration.....	0.0110	0.0125
Sulfaquinoxaline mixed with Wirthmore Starter and Broiler Ration.....	0.0134	0.0125
Sulfaquinoxaline mixed with Wirthmore Starter and Broiler Ration.....	0.0104	0.0125
Sulfaquinoxaline mixed with Wirthmore Turkey Starting Ration.....	0.0156	0.0175
Dailey Mills, Inc.		
Sulfaquinoxaline mixed with Double Diamond Starter Broiler.....	0.0140	0.0125
Dietrich & Gambrell, Inc.		
Sulfaquinoxaline mixed in D & G Broiler Mash.....	0.0106	0.0125
Sulfaquinoxaline mixed in Gambrell's Chick Starter.....	0.0112	0.0125
Sulfaquinoxaline mixed in Gambrell's Chick Starter.....	0.0102	0.0125
Eastern States Farmers' Exchange, Inc.		
Sulfaquinoxaline incorporated in Minuteman.....	0.0513	0.05
Sulfaquinoxaline incorporated in Minuteman.....	0.0440	0.05
Sulfaquinoxaline incorporated in Minuteman.....	0.0520	0.05
Sulfaquinoxaline incorporated in Turkey-Starter.....	0.0170	0.0175
Elmore Milling Co., Inc.		
Sulfaquinoxaline incorporated in Elmore Chixsaver.....	0.0090	0.0125
Sulfaquinoxaline incorporated in Elmore Chixsaver.....	0.0110	0.0125
Essex County Co-operative Farming Assn.		
Sulfaquinoxaline incorporated in S-X and Starter Broiler Ration.....	0.0110	0.0125
Farm Bureau Assn.		
Sulfaquinoxaline mixed with Chick Starter Mash.....	0.0118	0.0125
Sulfaquinoxaline mixed with Chick Starter Mash.....	0.0116	0.0125
Sulfaquinoxaline mixed with High Energy Broiler and Starter Mash.....	0.0120	0.0125
Sulfaquinoxaline mixed with High Energy Broiler and Starter Mash.....	0.0103	0.0125
Sulfaquinoxaline mixed with High Energy Broiler and Starter Mash.....	0.0074	0.0125
Sulfaquinoxaline incorporated in High Energy Broiler & Starter Mash Base.....	0.0108	0.1
General Mills, Inc., Larroe Division		
Sulfaquinoxaline incorporated in Larro Broiler Feed.....	0.0122	0.0125
Sulfaquinoxaline incorporated in Larro Broiler Feed.....	0.0124	0.0125
Nitrosal Mix incorporated in Larro Broiler Feed.....	*	*
Sulfaquinoxaline incorporated in Larro Chick Builder.....	0.0138	0.0125
Sulfaquinoxaline incorporated in Larro Chick Builder.....	0.0126	0.0125

* Nitrosal found, 0.0338%; guaranteed, 0.0290%.

Brands Containing Sulfaquinoxaline—Continued

These brands substantially complied with guarantees of protein, fat and fiber, except as noted.

Manufacturer and Brand	Sulfaquinoxaline	
	Found	Guaranteed
D. H. Grandin Milling Co. Sulfaquinoxaline incorporated in Grandin's Start-To-Finish Mash.....	0.0088	0.0125
Maritime Milling Co., Inc. Sulfaquinoxaline incorporated in B-B Ma-Co Broiler Ration.....	0.1420	0.1
¶Sulfaquinoxaline incorporated in B-B Ma-Co High Energy Broiler Ration	0.0130	0.0125
Ogden Grain Co. Sulfaquinoxaline incorporated with Ogden Hi-Energy Starter & Broiler ...	0.0104	0.0125
Park & Pollard Co., Inc. Sulfaquinoxaline incorporated in Hi-Power Broiler Ration.....	0.0085	0.0125
Sulfaquinoxaline incorporated in Hi-Power Broiler Ration.....	0.0084	0.0125
Sulfaquinoxaline incorporated in Lay or Bust Chick Starter.....	0.0124	0.0125
Sulfaquinoxaline incorporated in Lay or Bust Growing Feed.....	0.0084	0.0125
Sulfaquinoxaline incorporated in Lay or Bust Hi-Valu Scratch Pellets.....	0.0104	0.0125
Ralston Purina Co. Sulfaquinoxaline distributed in Purina Broiler Checkers Supplement.....	0.0136	0.0125
Sulfaquinoxaline in Purina Broiler Chow.....	0.0106	0.0125
Sulfaquinoxaline in Purina Broiler Chow (Special).....	0.0116	0.0125
Sulfaquinoxaline in Purina Chick Growena.....	0.0120	0.0125
Sulfaquinoxaline distributed in Purina Turkey Startena.....	0.0140	0.0125
Sulfaquinoxaline distributed in Purina Turkey Startena.....	0.0130	0.0125
United Cooperative Farmers, Inc. Sulfaquinoxaline mixed with UCF Starter.....	0.0143	0.0125
Sulfaquinoxaline mixed with UCF Super Starter.....	0.0125	0.0125
C. P. Washburn Co. Sulfaquinoxaline mixed with Made Right High Energy Broiler.....	0.0100	0.0125
Sulfaquinoxaline mixed with Made Right Starting Feed.....	0.0102	0.0125
H. K. Webster Co. Sulfaquinoxaline incorporated in All Mash Growing Ration.....	0.0115	0.0125
Sulfaquinoxaline incorporated in All Mash Growing Ration.....	0.0116	0.0125
Sulfaquinoxaline incorporated in All Mash Growing Ration.....	0.0132	0.0125
Sulfaquinoxaline Mixture Super Starter and Broiler.....	0.0130	0.0125
Sulfaquinoxaline Mixture Super Starter and Broiler.....	0.0115	0.0125

* Nitrosal found, 0.0338%; guaranteed, 0.0290%.

¶ See also table of "Brands Not Conforming to Guarantees."

Brands Containing Nitrophenide

These brands substantially complied with guarantees
of protein, fat and fiber.

Manufacturer and Brand	Nitrophenide	
	Found	Guaranteed
Eastern States Farmers' Exchange, Inc.		
Nitrophenide incorporated in All-Mash Developer—WN.....	0.0108	0.0125
Nitrophenide incorporated in Pacemaker.....	0.0154	0.0125
Nitrophenide incorporated in Pacemaker.....	0.0108	0.0125
Nitrophenide incorporated in Pacemaker.....	0.0122	0.0125
Glidden Co., Feed Mill Division		
Nitrophenide (Megasul) mixed in Glidden Broiler Ration.....	0.0114	0.0125
Nitrophenide (Megasul) mixed in Glidden Broiler Ration.....	0.0176	0.02
Nitrophenide (Megasul) mixed in Glidden Chick Starter.....	0.0112	0.0125
Nitrophenide (Megasul) mixed in Glidden Super Broiler Ration.....	0.0196	0.02
Harper Feed Mills, Inc.		
Nitrophenide incorporated in Harco Complete Starter-Broiler Ration.....	0.0128	0.0125
Nitrophenide incorporated in Harco Special Hi-Energy Broiler Mash.....	0.0098	0.0125
Kasco Mills, Inc.		
Nitrophenide (Megasul) incorporated with Kasco All Mash Grower Ration.....	0.0116	0.0125
Nitrophenide (Megasul) incorporated with Kasco Broiler-Starter Ration.....	0.0242	0.022
Maritime Milling Co., Inc.		
Nitrophenide incorporated in B-B Ma-Co Broiler Ration.....	0.0304	0.025
Quaker Oats Co.		
Nitrophenide mixed with Ful-O-Pep Broiler Mash.....	0.0258	0.025
David Small		
Nitrophenide incorporated in David Small's Hi Energy Broiler Ration.....	0.0130	0.0125
Nitrophenide incorporated in David Small's Hi Energy Broiler Ration.....	0.0180	0.0125
Nitrophenide incorporated in David Small's Hi Energy Broiler Ration.....	0.0125	0.0125
Unity Feeds, Inc.		
Megasul Brand of Nitrophenide mixed with Unity Advance Ration.....	0.0126	0.01875
Megasul Brand of Nitrophenide mixed with Unity Super Ration.....	0.0182	0.01875
Megasul Brand of Nitrophenide mixed with Super-Gro Ration.....	0.0176	0.01875
H. K. Webster Co.		
Blue Seal Nitrophenide Mixture A Chick Starter Containing Megasul.....	0.0088	0.0125
Blue Seal Nitrophenide Mixture A Chick Starter Containing Megasul.....	0.0040	0.0125

Dry Dog Foods

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Allied Mills, Inc.							
Wayne Dog Food Blox.....	26.4	25	8.1	6	3.8	5	12.9
Wayne Dog Food Krums.....	25.9	25	7.2	6	3.6	5	11.8
Animal Foundation, Inc.							
Hunt Club Dog Meal.....	24.5	25	6.2	5	2.2	4	8.3
Arcady Farms Milling Co.							
Arcady Dog Ration.....	34.0	30	6.5	5	4.0	4.5	10.3
Arcady Dog Ration.....	25.2	26	5.0	5	4.0	5.5	6.9
E. W. Bailey & Co.							
Pennant Brand Dog and Puppy Ration	28.5	24	4.6	4	3.0	4	12.4
Battle Creek Dog Food Co.							
Miller's Dog Meal.....	22.9	22	5.6	3	2.8	4	9.0
Miller's Kibbles.....	24.0	22	3.1	2	1.7	3	8.6
Beacon Milling Co., Inc.							
Beacon Dog Meal.....	30.7	22	6.7	4	4.1	5	10.0
Beacon Dog Pellets.....	28.0	24	6.5	4	4.1	5	8.8
Beacon Puppy Starter.....	24.9	24	6.2	5	4.4	4.5	9.3
Best Dog Food Co.							
Vita Best Kibbled Biscuits.....	21.1	18.31	2.4	1.90	1.6	4.05	8.7
Borden Co., Special Products Division							
Borden's Dog Food.....	25.0	25	6.3	5.5	3.2	5	8.8
Chas. M. Cox Co.							
Wirthmore Dog Food.....	28.0	25	7.7	7	3.6	5	12.3
Wirthmore Medium Kibbled Dog Biscuit	26.5	26.5	2.4	2.5	2.1	3	9.7
Wirthmore Medium Kibbled Dog Biscuit	25.5	23	3.2	2.5	2.3	3	6.5
John C. Dow Co.							
Dow's Dog Biscuits.....	20.4	21	1.1*	3	1.2	2	6.2
Dow's Crunchy.....	22.9	21	3.0	2.5	1.4	2	5.9
Dow's New Improved Crumpled Meal..	24.0	24	5.0	4	2.5	3.5	11.9
Drackett Products Co.							
Charge—Candy for Dogs.....	9.1	9.5	11.7	9	0.5	1	8.3
East Longmeadow Grain Store							
P & D Pets Delight Dog Meal.....	25.2	24.5	5.7	4	3.6	5.5	6.9
Eastern States Farmers' Exchange, Inc.							
Eastern States Dog Feed.....	24.9	24	6.3	5.5	3.2	4	8.6
Elmore Milling Co., Inc.							
Elmore Completely Balanced Dog Food.	21.4	22	6.3	3	3.0	3	11.4
General Foods Corp., Gaines Division							
Gaines Kruchon.....	25.9	25	6.5	6	4.0	5	8.4
Gaines Meal.....	25.5	25	7.6	6	3.7	5	9.1
General Mills, Inc., Larrowe Division							
Larro Dog Food.....	{ 26.6	24.5	7.3	4.5	5.1	6	9.8
	{ 26.1	24.5	4.9	4.5	5.4	6	10.7
Great Atlantic & Pacific Tea Co.							
Daily Dog Food Whole Biscuit.....	23.2	22	4.3	3	2.1	3.5	3.6
Daily Dog Pellets.....	24.4	23	3.7	3.5	2.2	4.5	10.1
Harper Feed Mills, Inc.							
Harco Vi-En-Am Dog Food.....	30.3	24	4.8	3	2.9	3	11.3
Hartz Mountain Products							
Dog Yummies.....	32.1	25.5	7.7	2.4	2.8	5.9	9.7
Kasco Mills, Inc.							
Kasco Complete Dog Ration.....	27.6	25	10.2	7	3.7	4	8.9

* Deficient in fat.

Dry Dog Foods—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed	
Kellogg Co. Kellogg's Gro-Pup Dog Food.....	26.0	25	4.8	5	4.3	4	7.0
Kennel Food Supply Co., Inc. Cero-Meat Brand Dog Food.....	23.3	21	1.6	2	1.9	3	6.5
Fairfield Dog Meal.....	24.8	20.5	4.2	2.63	2.3	3.62	11.9
K.F.S. Biscuits.....	22.5	21	2.7	2	1.9	3	7.8
Geo. Q. Moon & Co., Inc. Moon's Dog Food.....	24.0	24	5.9	4	3.8	4	9.9
National Biscuit Co. Milk-Bone Dog Biscuit.....	23.1	21	2.9	1.5	1.8	2.5	5.9
Pal Dog Biscuit.....	23.1	21	2.6	1.5	1.7	2.5	5.8
	21.3	18.5	1.1	1	2.0	2.5	5.1
Old Mother Hubbard Dog Food Co., Inc. Old Mother Hubbard Three Formula Kibbled Dog Biscuits.....	22.3	20	2.0	2.	1.6	3	5.6
Old Trusty Dog Food Co., Inc. Old Trusty All Terrier Food.....	25.5	25	3.4	2.5	1.7	3	9.4
Old Trusty Bone-Shaped Biscuits.....	21.5	19	1.8	1.8	1.6	1.8	5.9
Old Trusty Supreme Meal.....	25.7	23	6.5	3.5	2.3	5	9.6
Park & Pollard Co., Inc. Munchy Dog Food.....	28.0	26	7.7	4	3.0	4.5	8.9
Quaker Oats Co. Ken-L-Biskit.....	21.2	20	4.9	4	2.1	3	5.4
Ken-L-Meal.....	20.8	21	4.2	4	2.7	4.5	8.4
Ralston Purina Co. Purina Dog Chow (Checkers).....	23.9	21	4.6	4	4.1	6	10.1
Purina Dog Chow Kibbled Meal.....	25.6	21	7.8	4	3.8	6	11.6
Spratt's Patent (America) Ltd. Spratt's Assorted Dog Biscuits.....	21.3	20	2.4	2	1.5	7.5	2.9
Spratt's Charcoal Ovals.....	20.2	20	3.8	2	4.3	7.5	7.7
Sturdy Dog Food Co. Sturdy Kibbled Ration.....	21.5	21	3.4	3	1.8	2	9.6
Sunshine Biscuits, Inc. Austin's Dog Food.....	22.2	22	3.4	2.5	3.9	4.5	7.4
Swift & Co. Swift's Dog Meal.....	27.6	26	10.3	7.5	4.1	6	7.8

Alfalfa Meals

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligram per Pound
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		
Al-Fa Meal Co., Dehydrated Alfalfa Meal.....	19.8	17	2.6	1.5	25.7	27	10.2	38.1
Bremco Mills, Inc. Med-O-Green Alfalfa Meal.....	17.7 17.1 19.1 18.9	17 17 17 17	2.0 2.4 3.3 2.4	1.5 1.5 1.5 1.5	27.7 28.6 ^a 23.9 24.1	27 27 27 27	7.8 8.6 7.9 8.6	27.5 27.4 52.4 52.9
Caro-Green, Inc. Caro-Green Dehydrated Alfalfa Meal.....	16.5	17	3.5	1.5	26.7	27	8.9	31.3
Central Mills, Inc. Cent-O-Green Dehydrated Alfalfa Meal.....	18.5	17	3.0	1.5	23.3	27	10.8	59.0
H. E. Clark Co. HEC Co 17% Dehydrated Alfalfa Meal.....	16.7	17	2.6	1.5	29.6 ^a	27	10.7	21.8
Dehydrated Alfalfa Mills, Inc. Dehydrated Alfalfa Meal 17%.....	17.4	17	2.8	1.75	26.7	27	9.8	20.9
Keystone Dehydrators Keystone Super-Green Dehydrated Alfalfa Meal.....	18.1 19.0	17 17	2.8 2.9	2 2	28.1 22.0	27 27	8.5 9.1	57.2 29.0
Miller Alfalfa Co. Dehydrated Alfalfa Meal.....	18.8	17	3.3	1.5	22.5	27	9.0	54.4
Platte Valley Products, Inc. 17% Alfalfa Meal.....	19.7	17	2.5	1.5	24.1	27	11.3	52.7

^a Excessive fiber.

Alfalfa Meals—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligrams per Pound
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		
Portage Valley Milling Co. Valley Green Dehydrated Alfalfa Meal.....	19.4 19.1	17 17	2.9 3.4	1.5 1.5	24.7 23.5	27 27	7.7 8.4	54.0 44.9
Saunders Mills, Inc. Dehydrated Alfalfa Meal 17.....	15.8 ^b 17.1 16.3	17 17 17	2.9 2.8 3.2	1.5 1.5 1.5	26.6 25.4 23.6	30 30 30	8.2 9.1 10.3	33.1 31.8 40.8
Schoenck Farms, Inc. Schoenck's Super-Green Dehydrated Alfalfa Meal.....	18.2	17	2.8	2	25.5	27	5.0	37.6
Schwab Brothers Mills, Inc. Dehydrated Bavaria Brand Alfalfa Meal 17%.....	17.3	17	2.2	1.5	28.9 ^a	27	8.6	27.2
W. J. Small Co., Inc. Small's 20% Dehydrated Alfalfa Meal.....	21.7 17.3	20 17	2.9 3.7	1.75 1.75	21.3 29.0 ^a	20 27	12.2 9.9	66.2 34.3
Small's 17% Dehydrated Alfalfa Meal.....	18.2 18.8	17 17	2.8 3.0	1.75 1.75	27.3 24.2	27 27	10.7 11.5	33.1 44.9
Alfalfa Meal.....	13.6 16.3	13 13	2.0 2.4	1.5 1.5	38.1 ^a 28.2	33 33	7.7 9.0	29.1 33.6
Sun Valley Milling Co. Dehydrated Alfalfa Meal 17.....	17.2	17	2.5	1.5	26.9	30	9.4	24.7
Waldo Alfalfa Milling Co. Waldo Dehydrated Alfalfa Meal.....	18.0	17	4.1	2.5	19.9	27	6.9	35.8
Western Milling Co. Dehydrated Westsun Brand Alfalfa Meal.....	18.3	17	2.6	1.5	21.0	27	14.0	45.2

^a Excessive fiber.^b Protein deficient.

Feed Supplements

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Riboflavin Milligrams per Pound		Choline Milligrams per Pound	
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed		Found	Guar- anteed	Found	Guar- anteed
Borden Co., Special Products Division Flaydry Poultry Feed Supplement with Added Choline Equivalents.....	45.1	35	1.6	0.5	5.4	66	8.2	29.8	—	1591	935
Dawes Manufacturing Co. Flavonne Kibo-D.....	34.9	31	3.3	2	5.0	6	7.9	30.8	22.7	1096	908
*Flavonne Kibo-D.....	33.3	31	2.1	2	4.4	6	7.4	23.7	22.7	1732	1500
Gorton-Pew Fisheries Co., Ltd. †Gorton's All-Fish Blend "Junior".....	41.8	40	8.0	6	6.9	8	17.8	20.5	—	—	—
H. P. Hood & Son, Inc. Non Fat Dry Milk Solids.....	30.9	28	8.6	0.75	—	—	9.1	8.3	—	—	—
Non Fat Dry Milk Solids for Animal Feed.....	28.7	28	12.3	0.75	—	—	9.8	9.6	—	—	—
Powdered Skim Milk.....	34.6	32	1.1	0.5	—	—	8.0	—	—	—	—
Kraft Foods Co. Kraco Dried Cheese Whey.....	12.0	12	1.0	0.5	—	—	8.2	8.4	—	—	—
Kraco Dried Cheese Whey.....	12.8	12	1.9	0.5	—	—	8.6	9.8	—	—	—
Kraylets for Livestock—Poultry.....	21.5	20	4.9	4.5	1.6	2	7.0	11.7	—	—	—
National Distillers Products Corp. Nadrisol Brand Corn Distillers Dried Solubles.....	25.4	25	9.5	5	4.4	4	6.3	7.7	—	—	—
Schenley Distilleries, Inc. Schenley's Soludri.....	23.4 ^a	25	6.8	3	4.8	5	6.9	10.2	—	—	—
Whitmoyer Laboratories, Inc. Clo-Meal.....	44.2	38	22.8	10	1.7	3.75	5.2	61.2	70.0	7710	7000
Flav-A-Dec.....	27.0	24	18.4	16	8.1	10	7.2	45.2	40.0	—	—

* Vitamin D guarantee of 18,160 A.O.A.C. Chick Units, found sustained.

† Carotene found, 8.9 milligrams per pound.

^a Deficient in protein.

Fish Liver Oils and Other Vitamin Supplements

L. R. Parkinson, in charge of the Nutrition Laboratory, cooperated with the Feed Control Service in the chick assay of the vitamin D feed supplements and fish liver oils.

Manufacturer and Brand	Vitamin D A.O.A.C. Units per Gram Guaranteed	Guarantee	Vitamin A U.S.P. Units per Gram Guaranteed	Guarantee
Alaska Fish Oil Extractors, Inc. Alaska A & D Feeding Oil.....	400	Sustained	1 500	Sustained
Eastern States Farmers' Exchange, Inc. Vitamin A & D Feeding Oil.... Eastern States Calif Tablets....	400 —	Sustained —	2,250 12,000	Sustained Sustained
Gorton-Pew Fisheries Co., Ltd. Gorton's Vitamin A & D Feeding Oil.....	400	Not sustained	1,000	Sustained
Marden-Wild Corp. Marden's Poultry Feeding Cod Liver Oil.....	400	Sustained	1,000	Sustained
Nopco Chemical Co. Nopco Cod Liver Oil with Vitamin A & D Concentrate.	400	Sustained	3,000	Sustained
Silmo Chemical Corp. Vitamin A & D Feeding Oil ...	400	Sustained	1,500	Sustained
Vi-D-Co. CHIC Dry Vitamin D—For Poultry.....	2,000	Sustained	—	—
Whitmoyer Laboratories, Inc. Dri-Col 2000 D..... Whitmoyer Cod Liver Oil Concentrate.....	2,000 400	Sustained Sustained	— 1,500	— Sustained
Quality Vitamin A & D Feed- ing Oil.....	400	Sustained	1,500	Sustained
Whitmoyer Feeding Oil.....	400	Sustained	1,500	Sustained
Whitmoyer Cod Liver Oil.....	150	Sustained	1,500	Sustained

Tonics and Mineral Supplements

There are a considerable number of tonics, mineral supplements, and products of like nature being sold to feed manufacturers, feed dealers, and farmers. Usually the mineral content is either quantitatively guaranteed or its presence is indicated by a declaration of the mineral compounds in the list of ingredients.

A number of samples were collected and analyzed to check the claims made for the composition of these materials. In most cases it was found that our results substantiated the claims made. In one case cobalt and nickel compounds were listed as ingredients; analysis showed the absence of any significant quantities of either cobalt or nickel.

In the following table the guaranteed analysis is given opposite "G" and the amount found opposite "F."

Tonics and Mineral Supplements

Manufacturer and Brand	Manga- nese	Copper	Iodine	Zinc	Cobalt	Nickel	Magne- sium	Iron	Maxi- mum Salt	Phos- phorus	Calcium
Dairy Association Co., Inc.											
Kow Kare.....	—	—	.253	—	—	—	.90	—	—	4.12	9.03
Dr. Hess & Clark, Inc.											
Dr. Hess Tonic for Cows, Horses, Hogs, Sheep.....	—	—	.040 .058	—	—	—	—	—	21.00 20.20	3.12	12.00 19.64
Pan-A-Min.....	—	—	.040 .040	—	—	—	—	—	10.00 8.80	3.50 4.22	21.00 24.80
Dr. Hess Hog Special.....	.16	.057	.040 .047	—	—	—	—	—	23.00 20.00	3.00 3.72	15.00 19.64
Stock Tonic.....	.10 .18	— .039	.040 .037	—	—	—	—	—	23.00 20.30	3.50 3.64	15.00 22.42
Herman Nagel Co.											
Herman Nagel's Formula B Phosphorus Concentrate....	—	.079	.10 .104	.030	.018	.024	—	—	—	15.00 15.51	18.00 20.83
Herman Nagel's Formula B Phosphorus Concentrate with Trace Minerals.....	—	.054	.10 .100	.026	.015	.010	—	—	—	18.00 18.60	18.00 18.65
Pratt Food Co.											
Pratt's Poultry Regulator.....	—	.017	.0034	—	—	—	.27	—	—	—	23.71
Whitmoyer Laboratories, Inc.											
Tra-Min (Trace Mineral Compound).....	5.75 6.23	.19 .18	.11 .12	.07 .09	.05 .041	—	—	3.70 4.23	—	—	18.00 21.08
Tra-Phos.....	1.183 1.20	.039 .033	.022 .024	.014 .015	.010 .0084	—	—	.746 1.14	—	18.00 18.30	18.00 18.20

The Quality of Soy Bean Oil Meal

Experimental work has established that properly cooked soy bean oil meal has greater nutritive value than either undercooked or overcooked meal. Apparently the heat required to produce a meal of high nutritive value will also render inactive the enzyme urease that is present in raw soy beans and in uncooked soy bean oil meal. Therefore, there is good correlation between the nutritive value and the urease activity of soy bean oil meal.

This fact has been used as the basis in the development of several methods for determining whether or not a particular meal has been cooked adequately. Strictly speaking, these methods measure the urease activity of the soy bean oil meals.

It has been found that soy bean oil meal having a high urease activity, indicating undercooking, also usually contains a relatively high percentage of water-soluble protein. In cases of very high urease activity about 60 percent of the total protein was found to be in the water soluble form. In properly cooked meals usually less than 10 percent of the total protein is water-soluble.

Fourteen samples of soy bean oil meal were examined by the Massachusetts Control Service during the past season. The urease activity was determined in all cases. The water-soluble protein was determined in several samples that showed some urease activity.

Work done in other laboratories shows that tests resulting in an increment of less than 1.0 in the pH value indicate that the meal has been cooked adequately.

On this basis and on the basis of the percentage of the water-soluble protein found, it is indicated that all the fourteen samples reported in the following table had been properly cooked.

Soy Bean Oil Meals

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Increment in pH after Addition of Urea	Per Cent of Total Protein in Water Soluble Form
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed			
Archer-Daniels-Midland Co. Old Process Soybean Oil Meal.....	44.6	41	4.5	4.5	6.6	7	5.5	.00	—
Canadian Vegetable Oil Processing, Ltd. Soybean Oil Meal.....	43.8	41	5.6	4	6.0	7	6.0	.00	—
Cargill, Inc. 44% Protein Solvent Extracted Soybean Oil Meal.....	46.4	44	4.1	0.5	5.2	7	6.0	.00	—
Central Soya Co., Inc. Central Star Brand Soybean Oil Meal.....	47.6	44	1.0	0.5	5.4	7	6.3	.40	4.9
Spencer Kellogg & Sons, Inc. Spencer Kellogg's 44% Protein Toasted Soybean Oil Meal.....	46.6	44	0.7	0.5	5.9	7	5.4	.00	—
Spencer Kellogg's 44% Protein Toasted Soybean Oil Meal.....	48.7	44	0.9	0.5	5.3	7	5.9	.20	4.5
Oswego Soy Products Corp. Soy Bean Oil Meal Toasted (Blended).....	46.3	44	3.2	2.5	5.8	7	6.0	.45	6.8
Soy Bean Oil Meal Toasted (Extracted).....	46.4	44	3.4	0.5	4.8	7	5.8	.80	5.4
Soy Bean Oil Meal Toasted (Extracted).....	46.3	44	1.4	0.5	5.4	7	6.0	.35	5.0
Ralston Purina Co. 44% Protein Solvent Extracted Soybean Oil Meal.....	47.4	44	0.9	0.5	6.3	7	6.4	.00	—
44% Protein Solvent Extracted Soybean Oil Meal.....	45.1	44	1.4	0.5	6.8	7	5.8	.10	2.6
A. E. Staley Manufacturing Co. 44% Protein Solvent Extracted Soybean Oil Meal.....	45.7	44	0.7	0.5	6.4	7	6.7	.30	3.0
44% Protein Solvent Extracted Soybean Oil Meal.....	45.4	44	0.9	0.5	6.3	7	6.1	.00	—
Swift & Co., Soybean Mill Swift's 42% Protein Soybean Oil Meal (Expeller).....	46.4	42	5.4	3.5	5.3	7	6.4	.00	—

Oat and Barley Products

Considerable improvement has been noted in the quality of oat and barley products shipped into Massachusetts during the past season. However, greater improvement is desirable. This is evidenced by the fact that it was necessary to submit the analytical and shipping data on three lots of these products to the Federal Food and Drug Administration.

One of the lots was seized by the United States Marshal. The manufacturer relabelled this lot correctly before it was released. Court action was taken by the Food and Drug Administration in the case involving the other two lots. The manufacturer was found guilty and fined \$500.00.

Despite the suggestion of one of the oat products manufacturers that the Official Chemist "find another hobby," the Feed Control Service will continue to pay particular attention to the quality of oat products during the next year.

Oat and Barley Products

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Whole Weed Seeds per Pound	Results of Microscopic Examination
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed				
E. W. Bailey & Co. Pennant Brand Crimped Oats.....	12.8	12	4.0	4.5	10.0	12	3.1	—	none	As represented
Best Foods, Inc. Pulverized White Oats.....	11.3	—	5.5	—	10.6	—	3.4	—	none	As represented
Boyd Mills, Inc. Pulverized Mixed Feed Oats.....	11.1	11	3.5	3.5	15.2	14	5.8	3.0	2.700	Appears to be oat screenings
E. W. Caron Ground Oats.....	11.0	11	4.7	4.25	12.9	11.5	3.7	—	none	As represented
Cunningham Grain Co. Ground Oats.....	12.3	—	5.5	—	9.5	—	3.2	—	none	As represented
Des Moines Oat Products Co. Demon Pulverized Whole Oats.....	11.7	11	4.4	3.5	13.1	13	4.3	—	none.	As represented
Dietrich & Cambrell, Inc. D & G Crushed (Crimped) Oats.....	12.0	11	5.4	4	10.3	12	3.2	—	none	As represented
Doughboy Industries, Inc. Doughboy Pulverized Feed Barley.....	10.8	11	2.8	2.5	9.7	10	3.2	—	none	As represented
Bigvalu Pulverized Oats.....	11.6	11	4.0	3	14.1	13	4.6	—	none	Appears to be mixture of ground oats and screenings
	11.3	11	3.6	3	12.4	13	5.0	—	none	
	11.2	11	3.9	3	13.7	13	4.7	—	900	
	11.2	11	3.9	3	14.8	13	4.8	—	none	
	11.1	11	4.2	3	14.0	13	4.8	—	none	
New-Rich Pulverized White Oats.....	11.6	11	4.0	3	14.2	13	4.6	—	none	Appears to be mixture of ground oats and screenings
	10.6	11	4.1	3	14.0	13	4.5	—	none	
Fiambeau Milling Co. Pulverized White Oats.....	12.7	11	3.2	3.5	11.3	12.75	6.1	3.4	675	Appears to be mixture of oat and barley screenings

Oat and Barley Products —Continued

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Whole Weed Seeds per Pound	Results of Microscopic Examination
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed				
Fruen Milling Co. Fruen's Star Brand Pulverized Mixed Feed Oats.....	12.0	12	4.1	3	15.4	14	5.3	3.0	none	As represented
General Mills, Inc. Ground Oats.....	12.9	—	4.5	—	10.5	—	3.2	—	none	As represented
Pulverized Oats.....	12.4	12	4.9	4.5	14.3	13	5.2	—	none	As represented
Frank B. Ham & Co., Ltd. Hamco Brand Ground Oats.....	12.1	—	4.8	—	10.9	—	3.2	—	none	As represented
Fred A. McCain, Ltd. Ground Oats.....	10.3	—	4.7	—	11.3	—	2.5	—	none	As represented
Ogden Grain Co. Ograinco Ground Oats.....	12.3	—	4.3	—	11.0	—	3.3	—	none	As represented
Ogilvie Flour Mills Co., Ltd. Clumped Oats.....	13.0	—	4.7	—	8.8	—	2.8	—	none	As represented
LaCrosse Milling Co. Pulverized Mixed Feed Oats.....	12.2	10	5.0	3	15.1	14.5	6.4	4.0	1,800	As represented
Ralston Purina Co. Purina Rolled Oats (Steam Cooked).....	16.8	15	6.9	5	1.3	2	1.9	—	none	As represented
St. Cloud Milling Co. Pulverized White Oats.....	12.3	11	4.2	3.5	14.7	12.5	5.8	3.2	none	Appears to be ground mixed screenings
Pulverized White Oats.....	10.6	11	3.9	3.5	12.5	12.5	4.5	—	675	Appears to be a mixture of ground oats and screenings
Searle Grain Co. Fine Ground Mixed Feed Oats.....	12.1	12	5.3	4	15.7	15	4.1	—	none	As represented
Tougas & Tougas, Ltd. Ground Oats (Fine).....	10.5	—	4.9	—	15.2	—	3.7	—	none	Appears to be ground oat screenings

Oat and Barley Products—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Acid Insoluble Ash (Sand)	Whole Weed Seeds per Pound	Results of Microscopic Examination
	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed				
United Cooperative Farmers, Inc. Ground Oats.....	11.5	—	4.5	—	8.0	—	2.8	—	none	As represented
H. K. Webster Co. Blue Seal Crimped Oats.....	13.0	—	4.3	—	10.0	—	3.0	—	none	As represented
Ground Oats.....	11.8	—	4.7	—	8.0	—	3.2	—	none	As represented
Wickert Wholesale Ground Oats.....	9.8	—	4.0	—	15.2	—	3.5	—	none	As represented
Wisconsin Milling Co., Inc. Pulverized White Oats.....	11.2	10.5	5.0	3.5	17.2	13	5.7	3.7	1,125	Sample is ground screenings
Cases Referred to Federal Food and Drug Administration										
Flambeau Milling Co. Pulverized White Oats.....	11.7	11	3.8	3.5	14.7	12.75	6.5	3.8	not determined	Ground grain screenings consisting of about 8% chaff and dirt, 15% weed seeds, 25% other grains (mainly barley), 52% oats.
Pulverized Barley.....	13.4	11	4.3	2	11.1	9	5.7	3.0	not determined	Ground screenings consisting of about 8% chaff and dirt, 25% weed seeds, 25% other grains (mainly oats), 42% barley.
Wisconsin Milling Co., Inc. Pulverized White Oats.....	11.4	10.5	4.5	3.5	16.1	13	6.8	4.7	5,850	Mainly ground oat screenings containing at least 20% weed seeds.

Pulverized Hood

For a number of years some Massachusetts feed manufacturers have been buying a product labelled "Pulverized Hood" and using it in their mixtures in place of ground or pulverized oats. From time to time the Feed Control Service has analyzed samples of this material. Usually the samples were found to be as guaranteed with respect to the protein, fat and fiber content.

The chemical analysis of two samples taken the past season indicated the necessity for a more detailed examination of this material. The ingredients listed are pulverized oats, wheat, and barley. Careful microscopic examination indicates the samples to consist of mixtures of pulverized oat hulls or oat mill feed and a low grade wheat and/or barley flour.

It has been calculated, using the results of the microscopic and chemical examination as the basis, that the purchaser would have saved about \$20.00 per ton if he had bought separately the ingredients indicated by our tests to be present in the two samples of Pulverized Hood referred to here.

One of the samples was found to contain 17 percent fiber. The guaranteed fiber content was 13 percent. The manufacturer has been warned that future shipments will be checked and further mislabelling and adulteration will result in Federal action against him.

Pulverized Hood

Protein		Fat		Fiber		Ash	Results of Microscopic Examination
Found	Guaranteed	Found	Guaranteed	Found	Guaranteed		
11.6	11	2.9	2	17.0	13	4.7	Appears to be a mixture of ground oat hulls and low grade wheat flour.
11.3	11	3.6	2	15.1	13	4.1	Appears to be a mixture of ground oat hulls and low grade wheat and barley flour.

Screenings

As Screenings Investigator for the Association of American Feed Control Officials, the Official Chemist has made an extensive study of screenings.

About 100 samples of various kinds of screenings were received from the screenings industry and from other state control officials. These samples, as well as those taken in Massachusetts, were analyzed both chemically and microscopically by the Feed Control Service. The results are presented in the tables following this article.

The data obtained in this study indicate that the present official and tentative screenings definitions adopted by our control association should be revised.

The control official should have the answers to four questions before he can decide whether the sale of a particular lot of screenings should be permitted. These are:

1. Does it have value as a feed?
2. Does it contain viable weed seeds?
3. Does it contain any material that is injurious to animals or that will have detrimental effect on the quality of their milk or flesh?
4. Is it properly labelled?

It must be recognized that screenings is a mixture. A large percentage of the screenings handled by the screenings industry is marketed finally as blended screenings. Heavy grain and seed screenings are usually mixed with light weight chaffy screenings to produce a medium weight screenings that may contain the screenings from several kinds of grains and/or seeds. Therefore, most screenings are heterogenous mixtures consisting of different kinds of grains and/or seeds, hulls, chaff, weed seeds, and usually some sand and dirt. A study of the data given in the table indicates that some of the screenings even before blending are totally unlike in composition although labelled the same. For example, there are two lots of 44-pound Flax Screenings. One lot consists of 9 percent grains and seeds, 83 per cent weed seeds, and 8 percent hulls, chaff, dirt and sand. The other lot contains 79 percent grains and seeds, only 19 percent weed seeds, and 2 percent hulls, chaff, sand and dirt. Obviously, the name Flax Screenings cannot describe both lots correctly. The word "flax" used for describing the first lot is almost meaningless.

Because this condition applies also to the other types of screenings, it seems logical to apply the term Mixed Screenings to most of the screenings used and to allow the protein, fiber, and ash guarantees to indicate the quality.

The word "refuse" should be eliminated. According to the dictionary, the word "refuse" means waste or worthless matter, trash, rubbish. Used as an adjective it means rejected or worthless.

In a sense, particularly when looked at from the flour milling, malt, or oatmeal production angles, screenings is rejected material. But neither the feed manufacturers nor those engaged in livestock production consider the screenings now called refuse screenings either worthless or material fit only for rejection. The hundreds of thousands of tons of this product that are used annually for feeding purposes attest to this fact.

So far as sugar refining is concerned beet pulp is refuse, and citrus pulp is refuse to the concentrated and frozen fruit juice industry. Likewise, distillers' and brewers' grains are refuse from the viewpoint of alcohol manufacture. These grains were actually discarded as worthless at one time. Yet we do not have dried refuse distillers' grains or dried refuse beet pulp.

In our examination of the screenings samples we found a considerable number that contained over 60 percent weed seeds. Under the tentative definitions these samples would be labelled "refuse screenings."

In most cases the weed seeds were mainly foxtail seeds, although some samples contained up to 30 percent mustard seeds. According to Morrison, we have the following data for foxtail seeds in comparison to those for oats:

	Protein	Digestible Protein	Fat	Fiber	T.D.N.
Foxtail	12.1	8.6	4.1	8.6	75.7
Oats	12.0	9.4	4.6	11.0	70.1

Apparently there is no question regarding the feeding value of foxtail seeds.

There has been a rather general belief that mustard seeds are injurious. J. O. Tretsven and J. A. Nelson of the Montana Experiment Station in Bulletin 435 (1946) report that ground yellow mustard seed (*Brassica arvensis*) has a feeding value slightly higher than that of soy bean oil meal at an 8 percent level. It was found that fanweed or stinkweed seeds (*Thlaspi arvense*) have a feeding value equal to that of soy bean oil meal at the 8 percent level.

When 10 percent ground yellow mustard seed was substituted for equal amounts of ground barley in the concentrate, cows produced 100 pounds of milk on less concentrate. No objectionable effect on the flavor of milk was noticed. The cows ate readily a concentrate containing mustard seed up to 16 per cent. No detrimental effect on flavor of milk, cream or butter was noticed when 8 percent of fanweed seed was fed.

The analysis of the mustard and fanweed seed used is:

	Protein	Fat	Fiber
Wild mustard seed	23.4	30.2	11.0
Fanweed seed	11.1	24.6	17.3

Morrison lists the total digestible nutrients as 90.8 percent for wild yellow mustard seed.

Millions of tons of screenings have been fed to livestock in this country. A great deal of the tonnage contained over 10 percent mustard seed. There have been no detrimental effects reported to this Control Service either on the health of animals, quality of the milk, or on milk production because of the mustard seed content of screenings.

Therefore, it seems logical to conclude that screenings containing large amounts of weed seeds, if ground finely enough or otherwise treated to destroy seed viability, and properly labelled, have an important place in the feeding program of the country.

Screenings

Screenings Samples as Labelled	Protein %	Fat %	Fiber %	Ash %	Acid Insol. Ash %	Grains & Seeds %	Weed Seeds %	Hulls, Chaff, Dirt & Sand %
Grain.....	11.5	3.9	4.1	5.4	3.3	85	10	5
Feed, Canadian.....	15.3	3.2	4.8	3.2	2.3	60	39	1
Feed, Canadian.....	14.9	3.8	6.7	2.5	—	80	18	2
Wheaty Buckwheat.....	13.6	4.2	7.9	3.9	2.0	58	42	10
Grain.....	17.5	4.2	8.7	4.0	1.1	75	15	—
Wild Buckwheat.....	12.1	4.5	8.9	2.4	0.4	90	5	5
Heavy Seed, 48-lb.....	12.8	4.0	9.6	27.4	21.3	6	70	24
Grain.....	13.0	5.2	10.0	3.8	1.2	57	40	3
Wheat, 43-lb.....	16.1	5.9	10.1	5.9	3.8	43	52	5
Grain.....	12.9	4.2	10.2	5.6	2.2	80	5	15
Heavy Seed, 50-lb.....	15.1	5.2	10.2	10.9	8.5	5	80	15
Flax, 44-lb.....	16.7	10.1	10.3	5.9	3.6	9	83	8
Country Run, 45-lb.....	13.9	4.8	10.4	5.2	2.9	40	55	5
Grain.....	10.4	4.7	10.4	5.8	3.0	70	10	20
Shoreham.....	16.3	8.4	10.6	7.3	4.1	19	69	12
Flax, 44-lb.....	13.1	6.7	10.7	2.6	0.2	79	19	2
Flax.....	17.5	13.1	10.8	6.5	2.6	25	70	5
Wheat.....	14.4	5.2	10.8	6.4	3.5	39	41	20
Wheat, 49-lb.....	13.1	4.7	10.9	5.8	3.6	66	31	3
Flax, 38-lb.....	14.5	12.5	11.5	12.8	9.1	10	76	14
Broken Flax with Clover.....	11.8	10.0	11.8	8.9	3.4	81	16	13
Seed, 31 1/2-lb.....	13.8	5.2	11.9	16.4	6.5	18	64	18
Country Run, 40-lb.....	15.0	5.3	12.0	4.3	1.9	50	48	2
Heavy Seed, 48-lb.....	14.9	6.6	12.0	10.6	7.6	10	80	10
Flax, 36 1/2-lb.....	14.9	11.6	12.2	4.6	1.9	21	72	7
Clover & Alfalfa, Canadian.....	25.8	8.0	12.2	8.5	4.0	70	20	10
Heavy Seed, 45-lb.....	14.0	5.3	12.3	14.7	11.0	4	83	13
Seed, 43-lb.....	13.3	4.5	12.5	13.9	10.8	17	75	8
Heavy Seed, 46-lb.....	13.7	5.3	12.6	12.6	9.4	2	88	10
Canadian Refuse, 28-lb.....	14.8	10.0	12.7	10.4	4.8	29	46	25
Canadian Refuse, 30-lb.....	12.2	9.9	13.0	23.4	16.9	10	62	28
Elevator, 38-lb.....	16.1	9.4	13.1	5.1	2.2	43	54	3
Heavy Seed, 42-lb.....	14.9	6.2	13.3	13.7	10.5	11	78	11
Wild Buckwheat.....	13.9	6.2	13.3	8.0	5.3	40	53	7
Terminal Elevator, 32-lb.....	14.5	7.2	13.4	8.0	5.0	19	59	22
Elevator, 28-lb.....	13.2	6.3	13.4	13.8	9.5	10	60	30
Flax and Clover.....	15.5	4.6	13.4	8.5	2.2	38	37	25
Elevator, 27 1/2-lb.....	14.2	6.2	13.7	10.8	6.9	20	50	30
Canadian Refuse.....	16.2	9.3	13.9	8.8	4.5	0	60	40
Terminal Elevator, Wheat, 27-lb.....	14.9	6.0	14.1	10.8	7.2	55	27	18
Canadian Refuse.....	14.7	6.4	14.5	7.2	3.1	20	45	30
Canadian Refuse.....	15.1	9.5	14.5	7.4	3.5	10	60	30
Elevator, 25-lb.....	13.4	4.5	14.5	9.0	6.0	30	40	30
Medium Weight, 32-lb.....	14.1	5.7	14.5	10.3	7.4	10	80	10
Grain.....	16.1	8.5	14.6	10.4	5.4	20	60	20
From Various Grains, 27-lb.....	15.5	9.0	14.9	7.9	4.7	24	50	26
Seed House.....	23.2	3.8	14.9	9.2	4.1	52	37	11
Sweet Clover & Alfalfa.....	18.6	2.8	15.0	8.2	4.0	55	10	35
Canadian Refuse.....	15.2	8.6	15.1	12.6	8.1	12	48	40
Canadian Refuse.....	14.8	8.0	15.4	11.3	7.3	22	47	31
Canadian Refuse, 25-lb.....	15.4	6.9	15.4	10.9	6.6	32	41	27
Sweet Clover, 24-lb.....	19.4	2.3	15.5	8.9	1.2	45	—	55
Grain.....	13.8	6.1	16.0	10.3	6.2	15	35	50
Screenings.....	14.4	3.0	16.1	6.1	3.3	40	15	45
Barley, 20-lb.....	9.4	3.7	16.4	22.1	16.5	15	25	60
Flax, 40-lb.....	14.4	2.7	16.5	6.4	4.0	46	52	2
Canadian Wheat.....	13.9	6.6	17.0	9.5	4.8	5	40	55
Barley, 22-lb.....	13.6	6.1	17.5	9.7	6.8	23	41	36
Barley, 21-lb.....	11.8	3.2	17.5	9.9	6.7	25	35	40
Barley, 23-lb.....	13.7	6.5	17.8	11.2	7.8	24	43	33
Canadian Refuse, 22-lb.....	13.9	6.0	17.8	12.3	7.9	20	27	53
Barley, 20 1/2-lb.....	11.1	5.6	17.9	16.3	12.8	18	43	39
Barley.....	10.5	5.2	19.2	10.9	7.8	30	5	65
Barley.....	9.7	4.1	20.6	10.5	7.4	29	15	65
Wheat Scourings.....	11.1	3.1	21.6	11.8	7.8	9	14	77
Flax Chaff, 15 1/2-lb.....	13.5	8.3	22.2	10.5	3.5	10	12	78
Barley, 19-lb.....	11.5	5.2	22.9	9.8	6.8	26	41	33
Flax Chaff, 13-lb.....	12.5	5.5	23.8	9.5	3.9	5	5	90
Malt Hulls.....	11.9	1.2	23.9	6.4	4.2	0	0	100
Barley Chaff, 14-lb.....	7.3	2.6	24.1	11.9	8.7	5	5	90
Flax Chaff, 16-lb.....	12.5	7.1	26.3	8.0	3.1	16	10	74
Barley Chaff, 12-lb.....	6.6	1.9	27.5	15.8	11.8	0	0	100

Directory of Manufacturers Who Registered Feedingsuffs for Sale in Massachusetts in 1951

- Acme-Evans Co., Inc., 902 West Washington St., Indianapolis 9, Ind.
 L. P. Adams Co., 484 Housatonic St., Dalton, Mass.
 Adams Packing Association, Inc., Auburndale, Florida
 Ajax Dog Food Co., 49 Pine St., Dedham, Mass.
 Albers Milling Co., 6130 Avalon Blvd., Los Angeles 3, Cal.
 Allied Mills, Inc., Chicago, Ill.
 American Crystal Sugar Co., 600 Boston Bldg., Denver, Col.
 American Maize-Products Co., 100 East 42nd St., New York 17, N. Y.
 Animal Foundation, Inc., Sherburne, N. Y.
 Arcady Farms Milling Co., 223 West Jackson Blvd., Chicago 6, Ill.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2, Minn.
 Ashcraft-Wilkinson Co., 601 Trust Co., of Georgia Bldg., Atlanta, Ga.
- E. W. Bailey & Co., Montpelier, Vt.
 Bannock Food Co., Inc., West Chester, Penn.
 Barber & Bennett, Inc., Albany, N. Y.
 Battle Creek Dog Food Co., 60 East State St., Battle Creek, Mich.
 Bay State Milling Co., Winona, Minn.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Dog Food Co., 447 Timpson Place, Bronx 55, N. Y.
 Best Foods, Inc., 1442 Marine Trust Bldg., Buffalo 3, N. Y.
 Blatchford Calf Meal Co., 2 Madison St., Waukegan, Ill.
 Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
 Borden Grain Co., 700 West Water St., Taunton, Mass.
 Borden's Soy Processing Co., Division of the Borden Co., Kankakee Ill.
 Brown-Forman Distillers Corp., 1908 Howard St., Louisville, Ky.
 George B. Brown Corp., Ipswich, Mass.
 Buckeye Cotton Oil Co., Cincinnati 1, Ohio
- Canada Starch Co., Ltd., Montreal, Que., Canada
 Canadian Vegetable Oil Processing, Ltd., Hamilton, Ont., Canada
 A. B. Caple Co., Toledo 5, Ohio
 Cargill, Inc., 200 Grain Exchange, Minneapolis, Minn.
 CarO-Green, Inc., 328 Broad of Trade Bldg., Kansas City, Mo.
 Central Mills, Inc., Dunbridge, Ohio
 Central Soya Co., Inc., 300 Fort Wayne Bank Bldg., Fort Wayne, Ind.
 Champion Animal Food Co., 751 Taft St., N.E., Minneapolis 1, Minn.
 S. J. Cherry & Sons, Ltd., 166 King St., Preston, Ont., Canada
 H. E. Clark Co., 419 Main St., Winfield, Kansas
 Clinton Foods, Inc., Clinton, Iowa
 Clyde Milling Corp., Clyde, N. Y.
 Coatsworth and Cooper, Ltd., 67 Yonge St., Toronto, Ont., Canada
 Commander-Larabee Milling Co., 600 Baker Arcade, Minneapolis, Minn.
 Community Service, Inc., Canaan, Conn.
 Connecticut Grains Corp., Colchester, Conn.
 Consolidated Products Co., 119 North Washington Ave., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston, Mass.
 Continental Distilling Corp., 1429 Walnut St., Philadelphia 2, Penn.
 Copeland Flour Mills, Ltd., Midland, Ont., Canada
 Corn Products Refining Co., 17 Battery Place, New York 4, N. Y.
 Courcy & Sons Grain Co., Taunton, Mass.
 Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston 9, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
- Dailey Mills, Inc., Olean, N. Y.
 Dairymen's League Co-operative Association, Inc., 100 Park Ave., New York 17, N. Y.
 Dawe's Manufacturing Co., 4800 South Richmond St., Chicago, Ill.
 Dawnwood Farms, Smithfield Road, Amenia, N. Y.
 Decatur Milling Co., Inc., 717 North Union St., Decatur, Ill.
 Dehydrating Process Co., 10 High St., Boston 10, Mass.

- Delaware Mills, Inc., Deposit, N. Y.
 Delphos Grain & Soya Products Co., 201 South Jefferson St., Delphos, Ohio
 Derwood Mills, Inc., Derwood, Md.
 Frank Diauto, 87 Warren St., Randolph, Mass.
 F. Diehl & Son, Inc., 180 Linden St., Wellesley 81, Mass.
 Dietrich & Gambrill, Inc., South Carroll St., Frederick, Md.
 John C. Dow Co., 40 Prospect St., Gloucester, Mass.
 Drackett Products Co., 520 Springgrove Ave., Cincinnati, 32, Ohio
 J. L. Dunnell & Son, Bernardston, Mass.
 E. I. du Pont de Nemours & Co., Wilmington, Del.
- Eagle Roller Mill Co., New Ulm, Minn.
 East Longmeadow Grain Store, East Longmeadow, Mass.
 Eastern States Farmers' Exchange, Inc., 26 Central St., West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 Elk Valley Alfalfa Mills, a Division of Midland Industries, Inc., Independence, Kan.
 Elmore Milling Co., Inc., Oneonta, N. Y.
 John W. Eshelman & Sons, Lancaster, Penn.
 Essex County Co-operative Farming Assn., Topsfield, Mass.
 Excelsior Milling Co., 712 Flour Exchange Bldg., Minneapolis, Minn.
- Falk & Co., 104 Grain Exchange, Minneapolis, Minn.
 Farm Bureau Assn., 155 Lexington St., Waltham, Mass.
 Farmers Feed Co., 532 East 76th St., New York, N. Y.
 Feed Products, Inc., Groveland, Florida
 Ferneau Grain Co., Blanchester, Ohio
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Flambeau Milling Co., Phillips, Wis.
 Florida Citrus Cannery Cooperative, Lake Wales, Florida
 Flory Milling Co., Bangor, Penn.
 Fred A. Fountain, 355 Tremont St., Taunton, Mass.
- Nicholas Gangone, Plympton St., Middleboro, Mass.
 General Foods Corp., Aberjona Division, 209 New Boston St., Woburn, Mass.
 General Foods Corp., Corn Mill Division, Kankakee, Ill.
 General Foods Corp., Gaines Division, 151 South Indiana Ave., Kankakee, Ill.
 General Foods Corp., Post Cereals Division, 275 Cliff St., Battle Creek, Mich.
 General Mills, Inc., 400 Second Ave., S., Minneapolis, Minn.
 General Mills, Inc., Farm Service Division, 150 River St., Fitchburg, Mass.
 General Mills, Inc., Larowe Division, Detroit 2, Mich.
 Gerard Milk Products Co., 4101 East Monument St., Baltimore, Md.
 W. K. Gilmore & Sons, Inc., Walpole, Mass.
 Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis, Ind.
 Glidden Co., Soya Products Division, 1825 North Laramie Ave., Chicago 39, Ill.
 Gloucester By-Products, Inc., Gloucester, Mass.
 Gooch Milling & Elevator Co., 540 South St., Lincoln, Neb.
 Gorton-Pew Fisheries Co., Ltd., 327 Main St., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., 817 Andrus Bldg., Minneapolis, Minn.
- Hales & Hunter Co., 141 West Jackson Blvd., Chicago 4, Ill.
 D. Harbeck & Sons, 405 Earle St., New Bedford, Mass.
 Harper Feed Mills, Inc., 271 West Wheeling St., Washington, Penn.
 Hartz Mountain Products, 36 Cooper Square, New York 3, N. Y.
 Hercules Powder Co., Dairy Products Division, 821 Marquette Ave., Minneapolis 2, Minn.
 Dr. Hess & Clark, Inc., 7th & Orange Streets, Ashland, Ohio
 Hi-Life Packing Co., 431 South Dearborn St., Chicago 5, Ill.
 H. P. Hood & Sons, Inc., 500 Rutherford Ave., Boston 29, Mass.
 Hood Mills Co., Monument & Haven Streets, Baltimore 5, Md.
 Humbinger Co., 601 Main St., Keokuk, Iowa
 Humphreys-Godwin Co., 2246 Park Ave., Memphis, Tenn.
- Illinois Cereal Mills, Inc., 613 South Jefferson Ave., Paris, Ill.
 Illinois Yeast Co., Princeton, Ill.
 Independent Tallow Co., 39 Cedar St., Woburn, Mass.
 International Milling Co., 800 McKnight Bldg., Minneapolis, Minn.

Jaquith & Co., 305 Main St., Woburn, Mass.

Kansas Flour Mills Co., (Trade Name) of Flour Mills of America, Inc., Kansas City 13, Mo.

Kansas Milling Co., 7020 South Broadway, St. Louis, Mo.

Kasco Mills, Inc., 435 Fulton St., Waverly, N. Y.

Kellogg Co., Battle Creek, Mich.

Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.

Kennedy & Macdonald, 6 King Street, East, Toronto, Ont., Canada

Kennel Food Supply Co., Inc., 63 Mill Hill Ter., Fairfield, Conn.

Keystone Dehydrators, Nazareth, Penn.

H. H. King Four Mills Co., 1010 Grain Exchange, Minneapolis, Minn.

H. C. Knoke & Co., 5728 West Roosevelt Road, Chicago 50, Ill.

Chas. A. Krause Milling Co., P. O. Box 1156, Milwaukee 1, Wis.

Kronick's Coal & Grain Co., 43 Pleasant St., Adams, Mass.

Kuder Pulp Sales Co., Lake Alfred, Florida.

Lake of the Woods Milling Co., Ltd., 460 St. John St., Montreal, Que., Canada

Lauhoff Grain Co., 321 East North St., Danville, Ill.

Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.

L. B. Lovitt & Co., Memphis, Tenn.

Maine Fish Meal Co., Union Wharf, Portland, Maine

Mansfield Milling Co., Mansfield, Mass.

Maple Leaf Milling Co., Toronto, Ont. Canada

Marianna Sales Co., 510 Cotton Exchange Bldg., Memphis, Tenn.

Maritime Milling Co., Inc., 1009 Chamber of Commerce Bldg., Buffalo 2, N. Y.

McCabe Grain Co., Ltd., 980 Grain Exchange, Winnipeg, Man., Canada.

Merrimack Farmers' Exchange, Inc., Concord, N. H.

Miller Alfalfa Co., Defiance, Ohio

Miner-Hillard Milling Co., 826 Second National Bank Bldg., Wilkes-Barre, Penn.

Minute Maid Corp., P. O. Box 720 Leesburg, Florida

Geo. Q. Moon & Co., Inc., 201 Chenango St., Binghamton, N. Y.

Jas. F. Morse & Co., 11 Horace St., Somerville 43, Mass.

Morton Salt Co., 120 South LaSalle St., Chicago 3, Ill.

Mount Vernon Milling Co., Mount Vernon, Ind.

Myzon, Inc., 410 North Michigan Ave., Chicago 11, Ill.

Nappanee Milling Co., Inc., 301 South Jackson St., Nappanee, Ind.

National Alfalfa Dehydrating & Milling Co., Lamar, Col.

National Biscuit Co., 449 West 14th St., New York 14, N. Y.

National Biscuit Co., Toledo Mill, 2221 Front St., Toledo, Ohio

National Distillers Products Corp., 120 Broadway, New York 5, N. Y.

Near's Food Co., Inc., 115 Montgomery St., Binghamton, N. Y.

Neumond Co., 300 Merchants Exchange, St. Louis 2, Mo.

P. Fred'k. Obrecht & Son, Monument & Haven Streets, Baltimore 5, Md.

Ogden Grain Co., Utica, N. Y.

Ogilvie Flour Mills Co., Ltd., Montreal, Que., Canada

Old Mother Hubbard Dog Food Co., Inc., 40 Prospect St., Gloucester, Mass.

Old Trusty Dog Food Co., Inc., 278 West St., Needham Heights 94, Mass.

Oswego Soy Products Corp., Oswego, N. Y.

Palm Grain Co., Lowell, Mass.

Park & Pollard Co., Inc., 356 Hertel Ave., Buffalo 7, N. Y.

George H. Parker Grain Co., 56 Water St., Danvers, Mass.

Parrish & Heimbecker, Ltd., Toronto, Ont., Canada

Pasco Packing Co., Dade City, Florida

Patent Cereals Co., Geneva, N. Y.

Penick & Ford, Ltd., Inc., Cedar Rapids, Iowa

Perkins Oil Co., 727 Beale Ave., Memphis, Tenn.

Phenix Pabst-ett Co., 460 East Illinois St., Chicago, Ill.

Pilgrim Feed Co., Providence, R. I.

- Pillsbury Mills, Inc., Minneapolis 2, Minn.
Pittsford Flour Mills, Inc., Schoen Place, Pittsford, N. Y.
Plymouth Citrus Products Corp., Plymouth, Florida
Portage Valley Milling Co., Bradner, Ohio
R. C. Pratt & Co., Ltd., 18 Toronto St., Toronto, Ont., Canada
Publicker Industries, Inc., 1429 Walnut St., Philadelphia 2, Penn.
Purity Flour Mills, Ltd., 287 MacPherson Ave., Toronto 5, Ont., Canada
- Quaker Oats Co., Merchandise Mart Plaza, Chicago 54, Ill.
Quebec Sugar Refinery, (Registered by Toronto Elevators, Ltd., Montreal, Que., Canada).
Ralston Purina Co., 835 South Eighth St., St. Louis, Mo.
John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge, Mass.
D. F. Riley, North Hatfield, Mass.
Riverside Elevator Co., 1366 Penobscot Bldg., Detroit, Mich.
Robin Hood Flour Mills, Ltd., Moose Jaw, Sask., Canada
Rodney Milling Co., 1550 West 29th St., Kansas City 8, Mo.
Rudhard Products, Inc., 248 Michigan Ave., Buffalo 3, N. Y.
Russell-Miller Milling Co., 900 Midland Bank Bldg., Minneapolis 1, Minn.
Ryther & Warren Co., Belchertown, Mass.
- Saunders Mills, Inc., Toledo, Ohio
Schenley Distillers, Inc., 350 Fifth Ave., New York 1, N. Y.
Schoeneck Farms, Inc., Nazareth, Penn.
Sea Board Supply Co., 35th & Grays Ferry Ave., Philadelphia 46, Penn.
Joseph E. Seagram & Sons, Inc., Louisville 1, Ky.
Sherwin Williams Co., 101 Prospect St., Cleveland, Ohio
David Small, East Hartford, Conn.
W. J. Small Co., Inc., 1200 Oak St., Kansas City 6, Mo.
Allen V. Smith, Inc., Marcellus Falls, N. Y.
Sperti Products, Inc., 816 Clinton St., Hoboken, N. J.
Spratt's Patent (America), Ltd., 18 Congress St., Newark 5, N. J.
A. E. Staley Manufacturing Co., 22nd & Eldorado Streets, Decatur, Ill.
Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
Stock-Gro, Inc., 228 North LaSalle St., Chicago 1, Ill.
Stratton & Co., 57 Commercial St., Penacook, N. H.
Sturdy Dog Food Co., 2103 West Genesee St., Syracuse 4, N. Y.
Suni-Citrus Products Co., 601 Trust Co. of Georgia Bldg., Atlanta, Ga.
Sunshine Biscuits, Inc., Milling Division, Grafton, Ohio
Swift & Co., Union Stock Yards, Chicago 9, Ill.
Swift & Co., Eastern Feed Sales Division, 1215 Harrison Ave., Harrison, N. J.
Swift & Co., Soybean Mill, Fostoria, Ohio
- Taft Bros., Uxbridge, Mass.
Tarkio Molasses Feed Co., 567 Livestock Exchange Bldg., Kansas City 15, Mo.
Taunton Grain Co., Taunton, Mass.
Tavistock Milling Co., Ltd., Tavistock, Ont., Canada
Tioga Mills, Inc., Waverly, N. Y.
- Union Starch & Refining Co., 301 Washington St., Columbus, Ind.
United Cooperative Farmers, Inc., 339 Broad St., Fitchburg, Mass.
Unity Feeds, Inc., 177 Milk St., Boston 9, Mass.
Universal Grain Co. of New Jersey, 425 South St., Newark, N. J.
George Urban Milling Co., 332 North Oak St., Buffalo 3, N. Y.
- Valier & Spies Milling Co. (Trade Name) of Flour Mills of America, Inc., Kansas City 13, Mo.
Van Iderstine Co., Long Island City 1, N. Y.
Ventura Grain Co., 7 Purchase St., Taunton, Mass.
O. B. Vunck & Son, Voorheesville, N. Y.
- Hiram Walker & Sons, Inc., Peoria, Ill.
C. P. Washburn Co., Middleboro, Mass.
H. K. Webster Co., Lawrence, Mass.
West-Nesbitt, Inc., 26-34 Market St., Oneonta, N. Y.

Western Condensing Co., Appleton, Wis.
Whitmoyer Laboratories, Inc., Myerstown, Penn.
Wilson's Corn Products, Inc., East 4th St., Rochester, Ind.
Wirthmore Grain Co., Taunton, Mass.
Worcester Grain & Coal Co., 294 Franklin St., Worcester 8, Mass.

Yantic Grain and Products Co., Norwich, Conn.
Yieldmor Feeds, Inc., 101 South Downing St., Piqua, Ohio

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 149

JULY 1951

**Thirty-first Annual Report of
Pullorum Disease Eradication
in Massachusetts**

BY THE POULTRY DISEASE CONTROL LABORATORY

During the 1950-51 testing season a total of 556 chicken, turkey, and pheasant flocks was tested. The total number of samples (1,427,691) tested was slightly less than that of the previous season. The percentage of reactors was 0.05. It was encouraging to note that fewer "breaks" were found than in the previous season and that 96.67 percent of all birds tested were in 100 percent tested non-reacting flocks.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

THIRTY-FIRST ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1950-51

By the Poultry Disease Control Laboratory¹

INTRODUCTION

The results for the 1950-51 testing season indicate that Massachusetts poultrymen have been very successful in maintaining their flocks free of pullorum disease. The average percentage of reactors (0.05) was slightly less than that of the previous season. Only six "breaks" were detected as compared with 18 during the previous year. At the close of the season only six flocks were classified as infected. Furthermore, 96.67 percent of all birds tested were in 100 percent tested non-reacting flocks.

Testing operations were carried out with few difficulties, and most flock owners received service when they requested it. It is hoped that flock owners will continue to give their fullest cooperation in order that a high quality of service may be rendered the industry.

Appreciation is also expressed for the cooperation and assistance received in this program from the Extension Service, the Massachusetts Department of Agriculture, and other agencies.

SUMMARY OF SERVICE RENDERED

Applications received.....	568
Applications cancelled.....	12
Flocks tested.....	556
Chicken flocks.....	448
Turkey flocks.....	87
Pheasant flocks.....	21
Number of tests.....	1,427,691
Chickens:	
Routine.....	1,363,123
Experimental.....	31,069
Fowl other than chickens:	
Routine.....	33,488
Experimental.....	11
Owners receiving necropsy service.....	74
Necropsies of reacting birds.....	137

¹ Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor in charge; G. H. Snoeyenbos, G. P. Faddoul, Research Professors; O. S. Flint, Miriam K. Clarke, O. M. Olesiuk, Assistant Research Professors; C. D. Brandt, B. A. Bachman, G. W. Fellows, and H. A. Peck, Research Assistants. Appreciation is extended to Dr. J. B. Lentz, who retired as Head of the Department February 1, 1951, and to Dr. K. L. Bullis, who is now Head of the Department, for the assistance given to the testing work.

Table 1. Distribution of Tests and Reactors by Counties and by Breeds

Breeds	Parristable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Suffolk	Worcester	Totals	Percent Positive
Rhode Island Reds.....	6,693 0	7,583 0	76,590 0	161 0	40,701 0	17,200 0	16,378 0	13,572 0	54,509 157	79,852 0	43,509 4	540 0	88,655 0	445,943 161	0.04
Barred Plymouth Rocks....	5,135 0	11,604 0	42,391 0	4,251 0	9,801 0	25,215 1	3,652 0	6,953 0	61,787 4	29,221 0	53,637 0	..	44,852 0	298,509 5	0.002
New Hampshires.....	21,101 0	8,620 0	32,465 0	.....	93,829 0	909 0	3,792 0	19,879 0	108,190 1	44,155 0	108,634 3	..	41,237 0	482,811 4	0.0008
White Plymouth Rocks....	.....	14,392 6	1,969 0	.....	1,511 0	4,992 0	3,061 0	26,161 5	14,134 0	3,493 0	20,069 0	..	12,731 0	102,513 11	0.01
White Leghorns.....	.....	4,642 0	759 0	.....	8,698 0	1,176 9	.....	697 0	94 0	7,957 0	4,039 0	..	1,113 0	29,175 9	0.03
Miscellaneous.....	2,214 0	1,657 0	8,352 0	.....	3,275 0	439 0	230 0	250 0	4,477 0	6,641 0	3,002 0	..	4,704 575	35,241 575	1.63
Total Tests.....	35,143	48,498	162,526	4,412	157,815	49,931	27,113	67,512	243,191	171,319	232,890	540	193,302	1,394,192	0.05
Positive Tests.....	0	6	0	0	0	10	0	5	162	0	7	0	575	765	
(Percent)	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.007	0.07	0.00	0.003	0.00	0.30	0.05	

DISTRIBUTION OF TESTS AND REACTORS

Table 1 indicates that 1,394,192 samples were received from chicken flocks in 13 counties. The percentage of positive tests was 0.05. Middlesex, Plymouth, and Worcester Counties led in the number of tests. No reactors were detected in seven counties (Barnstable, Bristol, Dukes, Essex, Hampden, Norfolk, and Suffolk). With the exception of one, the remaining counties had less than 0.07 percent reactors.

The following breeds were tested: Bantam, Barred Plymouth Rock, Brahma, Columbian, Cornish (Red and White), Crosses, Delaware, New Hampshire, Rhode Island Red, White American, White Leghorn, White Plymouth Rock, Wyandottes (Buff, Golden, Silver Laced, White).

The Rhode Island Red, New Hampshire, and Barred Plymouth Rock were the predominating breeds. Of the total samples 31.99 percent were taken from Rhode Island Red, 34.63 percent from New Hampshire, 21.41 percent from Barred Plymouth Rock, and the remainder from other breeds tested. Of the 1,271,543 samples collected from females, 43,244 were from hens and 1,228,299 from pullets, with 0.002 and 0.06 percent reactors, respectively. The 122,649 samples collected from males gave 0.005 percent positive tests.

ANNUAL TESTING OF FLOCKS

Table 2 lists the results from flocks tested for the first time, intermittently, for two consecutive years, and for three or more consecutive years.

In the first year group there were 44 flocks, representing 95,991 tests, of which 0.61 percent were positive. In this group 41 flocks, containing 96.53 percent of the birds, were nonreacting, and three flocks were positive. The average number of birds per flock was 2,232.

In the group tested intermittently there were 23 flocks, representing 28,278 tests, of which 0.15 percent were positive. In this group 22 flocks, containing 97.32 percent of the birds, were nonreacting, and one flock was positive. The average number of birds per flock was 1,251.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100% Tested	Partially Tested	100% Tested	Partially Tested
Tested for the first time.....	44	94,824	95,991	584	0.61	36	5	2	1
Intermittent testing.....	23	28,278	28,278	43	0.15	20	2	1	-
Two consecutive years.....		17,741	118,654	115	0.15	56	4	-	1
Three or more consecutive years.	320	1,117,697	1,151,269	23	0.002	308	11	1	-
TOTALS.....	448	1,358,540	1,394,192	765	0.05	420	22	4	2

In the group tested for two consecutive years there were 61 flocks, representing 118,654 tests, of which 0.15 percent were positive. Sixty flocks were nonreacting, representing 98.31 percent of the birds tested in this group. The average number of birds per flock was 1,929.

In the group tested for three or more consecutive years there were 320 flocks, representing 1,151,269 tests, of which 0.002 percent were positive. A total of 319 nonreacting flocks was detected, which contained 97.90 percent of the birds tested in this group. One flock was positive. The average number of birds per flock was 3,462.

For the four groups, as a whole, 448 flocks were tested, representing 1,358,540 birds and 1,394,192 samples, of which 0.05 percent were positive. The 420 flocks that were 100 percent tested and nonreacting contained 1,313,260 birds or 96.67 percent of the total birds tested. Six flocks were classified as positive.

During the past year, 94, or 19.79 percent of the flocks tested in 1949-50, were not tested. Annual testing of flocks is recognized as essential in the control and eradication of pullorum disease. In flocks tested one year and not the next, infection is more likely to become established among the birds than in flocks tested annually. An effective program for maintaining pullorum clean flocks includes the annual testing of flocks.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

During the past year pullorum "breaks" were observed in six flocks in comparison with 18 "breaks" the previous season. The percentage of reactors did not exceed 0.20 for any of the flocks. In some instances only one reactor was detected.

Flock 1 had been negative for 14 consecutive years; the source of infection was the introduction of questionable stock.

Flock 2 had been negative for seven consecutive years; the infection appeared to have originated from a hatchery.

Flocks 3, 4, and 5 had been negative for two, three, and four consecutive years, respectively; the source of infection for these three flocks was unknown.

Flock 6 had been negative for one year; the source of infection was the introduction of questionable stock.

Four of the six flocks were retested and requalified for the official Pullorum Clean grade.

Table 3 gives information regarding "breaks" observed during the past 12 years. It is encouraging that the percentage of "breaks" was less than during the previous season. Flock owners should exercise every possible precaution against the introduction of infection.

The following measures have been found to be effective for establishing and maintaining a pullorum-free flock:

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the reports.

Table 3. The Incidence of "Breaks" Observed During the Past Twelve Years

Year	Number of Flocks	Breaks		Flocks with Less Than 0.5 Percent Infection on First Test	
		Number	Percent	Number	Percent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	50.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94
1948	425	16	3.76	13	81.25
1949	386	6	1.55	3	50.00
1950	383	18	4.70	16	88.88
1951	381	6	1.57	6	100.00

4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. An empty pen to each house should be provided to facilitate cleaning and disinfection during the winter months. Disinfectants approved by the United States Department of Agriculture should be used.
6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.
7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum-disease-free flocks. The Massachusetts Department of Agriculture, 41 Tremont Street, Boston, should be consulted regarding additions or replacements in the flock.
8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.
9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.
10. Poultrymen should not custom-hatch for untested or infected flocks (including fowl other than chickens).
11. Owners of pullorum-disease-free flocks should not have hatching done where infected eggs or stock may be found.
12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.
14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING FOWL OTHER THAN CHICKENS

During the past year 33,499 samples from fowl other than chickens including 24,017 turkeys, 6,833 pheasants, 2,101 quail, 278 geese, 216 ducks, 50 guinea fowl, and 4 chukar partridge were tested. No reactors were detected. Among the 87 turkey flocks tested only 15 had more than 500 birds per flock.

NONREACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4 nonreacting and positive flocks are listed by counties. A total of 442 nonreacting flocks, representing 1,339,068 birds, were identified in 13 counties. Of these, 420 were 100 percent tested, representing 1,313,260 birds, whereas 22 were partially tested and contained 25,808 birds. The nonreacting flocks detected in Barnstable, Dukes, Hampden, and Suffolk Counties were 100 percent tested.

Table 4. Nonreacting and Positive Flocks Classified by Counties

County	100% Tested		Partially Tested		Totals	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable.....	6	35,143	—	—	6	35,143
Berkshire.....	8	34,105	1	968	9	35,073
Bristol.....	57	156,435	3	2,877	60	159,312
Dukes.....	1	4,412	—	—	1	4,412
Essex.....	48	156,164	2	1,197	50	157,361
Franklin.....	23	45,144	2	1,973	25	47,117
Hampden.....	21	27,113	—	—	21	27,113
Hampshire.....	25	56,379	2	1,243	27	57,622
Middlesex.....	65	234,913	2	6,269	67	241,182
Norfolk.....	42	163,278	5	6,576	47	169,854
Plymouth.....	63	209,365	4	4,120	67	213,485
Suffolk.....	1	540	—	—	1	540
Worcester.....	60	190,269	1	585	61	190,854
TOTALS...	420	1,313,260	22	25,808	442	1,339,068
Positive Flocks						
Berkshire.....	1	13,425	—	—	1	13,425
Franklin.....	1	494	1	396	2	890
Hampshire.....	—	—	1	1,994	1	1,994
Middlesex.....	1	759	—	—	1	759
Worcester.....	1	2,404	—	—	1	2,404
TOTALS...	4	17,082	2	2,390	6	19,472

At the close of the season, only six flocks, representing 19,472 birds, were classified as infected. Of these flocks, four were 100 percent tested, and two partially tested. Positive flocks were identified in Berkshire, Franklin, Hampshire, Middlesex, and Worcester Counties.

These results suggest that pullorum infection is gradually being reduced and eliminated from Massachusetts flocks. Owners of infected flocks are urged to adopt effective measures towards establishing pullorum-free flocks.

COMPARISON OF 1949-50 AND 1950-51 TESTING

Table 5 lists a comparison of the testing data for the past two seasons. In seven counties more birds were tested, whereas in six counties less birds were tested than in 1949-50. The percentage of infection was slightly less than that of the previous season. In seven counties no reactors were detected. The number of nonreacting flocks was less than in the previous season. It is hoped that pullorum infection can be eliminated completely and that all tested flocks will qualify for the pullorum-free grades.

Table 5. Comparison of 1949-50 and 1950-51 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non-reacting Flocks
1949-50 Season					
Barnstable.....	5	45,715	45,715	0.002	5
Berkshire.....	10	42,114	42,114	0.005	9
Bristol.....	66	164,304	171,897	0.04	65
Dukes.....	2	4,648	4,648	0.00	2
Essex.....	64	167,160	171,333	0.07	63
Franklin.....	21	43,376	55,846	0.01	21
Hampden.....	20	26,381	26,381	0.02	19
Hampshire.....	29	53,352	82,248	0.62	27
Middlesex.....	83	236,750	250,292	0.03	81
Norfolk.....	42	146,048	151,689	0.0006	41
Plymouth.....	64	225,659	232,368	0.002	63
Worcester.....	69	205,358	209,833	0.004	69
TOTALS.....	475	1,360,865	1,444,364	0.06	465
1950-51 Season					
Barnstable.....	6	35,143	35,143	0.00	6
Berkshire.....	10	48,498	48,498	0.01	9
Bristol.....	60	159,312	162,526	0.00	60
Dukes.....	1	4,412	4,412	0.00	1
Essex.....	50	157,361	157,815	0.00	50
Franklin.....	27	48,007	49,931	0.02	25
Hampden.....	21	27,113	27,113	0.00	21
Hampshire.....	28	59,616	67,512	0.007	27
Middlesex.....	68	241,941	243,191	0.07	67
Norfolk.....	47	169,854	171,319	0.00	47
Plymouth.....	67	213,485	232,890	0.003	67
Suffolk.....	1	540	540	0.00	1
Worcester.....	62	193,258	193,302	0.30	61
TOTALS.....	448	1,358,540	1,394,192	0.05	442

THIRTY-ONE-YEAR TESTING SUMMARY

Table 6 is a summary of the testing results for the thirty-one years of testing. It is encouraging to note that Massachusetts flock owners are successful in establishing and maintaining pullorum-free flocks.

Table 6. Thirty-one Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non- reacting Flocks	Birds in Non- reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19
1947-48	494	1,219,957	1,272,547	0.10	476	1,185,852	97.20
1948-49	458	1,179,481	1,213,073	0.04	452	1,171,363	99.31
1949-50	475	1,360,865	1,444,364	0.06	465	1,344,860	98.82
1950-51	448	1,358,540	1,394,192	0.05	442	1,339,068	98.57

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: Annual testing of all birds on the premises is required by the Massachusetts regulations for official recognition. The true pullorum disease status of a flock cannot be determined by testing only part of the flock. Among the 475 flocks tested the previous season, 19.79 percent were not tested in 1950-51. Intermittent testing is conducive to the establishment of infection in flocks. In such instances the flock owner will suffer economic

losses through either mortality from the disease or increased costs of testing and through losses in the sale of hatching eggs or chicks. Through annual testing, pullorum infection is not permitted to become well established as is indicated by the results reported on "breaks." Eradication of the disease can be attained only through persistent testing of flocks and observing effective control measures.

Early Testing: The official regulations for pullorum control require that birds must be five months of age before they are eligible for the test. Since hatching of replacement stock extends throughout the calendar year, flocks owners are requested to have their flocks tested as soon as they become eligible for test in order to prevent a demand for service from the laboratory beyond its facilities and personnel. The majority of birds are tested from August through December. It is hoped that more birds can be tested in the other months of the year to relieve the congestion during the fall months. This will permit greater efficiency in the operation of the program.

The following summary lists the volume of tests by months:

Months	Number of Tests
April, 1950.....	33,557
May.....	57,316
June.....	119,889
July.....	125,041
August.....	145,346
September.....	132,090
October.....	182,428
November.....	193,024
December.....	167,553
January, 1951.....	156,838
February.....	63,631
March.....	46,602
April.....	4,376
TOTAL.....	1,427,691

Application cards for pullorum disease testing were distributed to owners of tested flocks early in the spring. These applications should be returned promptly with all the desired information. As the date for the testing of the flock approaches, sufficient deposit should be sent to the Treasurer of the University of Massachusetts. The number of birds to be tested should also be reported in adequate time. Application cards will be serviced in the order that they are received. Flock owners should not expect service on short notice. The laboratory personnel urges that flock owners write rather than telephone the laboratory for information well in advance of the desired testing date. More time is consumed in answering telephone calls than in answering correspondence regarding testing dates. The cooperation of the flock owner is solicited in maintaining an effective testing service at a reasonable cost.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 150

JULY 1951

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

BY FERTILIZER CONTROL SERVICE STAFF

This is the seventy-eighth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1951

BY FERTILIZER CONTROL SERVICE STAFF

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Assistant Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
Edward S. Berestka, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesium.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1

Tonnage fee: 6 cents per ten of 2,000 pounds

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN. W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

FERTILIZER TONNAGE
Tonnage of Fertilizers Sold in Massachusetts

	1949		1950	
	Jan. 1 to July 1	July 1 to Dec. 31	Jan. 1 to July 1	July 1 to Dec. 31
Mixed fertilizers.....	59,696	7,006	58,401	8,792
Fertilizer chemicals and materials unmixed.....	9,964	3,403	8,577	4,384
Pulverized animal manures.....	1,234	578	1,411	570
Totals.....	70,894	10,987	68,389	13,746

Tonnage of Mixed Fertilizers, January 1 to December 31, 1950

Grade*	Tonnage		Brands	Grade*	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31			Jan. 1 to July 1	July 1 to Dec. 31	
5-10-10	16,002	1,713	29	8-4-8	227	8	—
5-8-7	10,646	1,017	21	0-20-20	213	215	—
6-3-6	9,425	333	11	6-5-5	173	—	—
7-7-7	6,030	1,173	16	0-19-19	146	172	—
5-10-5	4,049	905	27	5-5-15	144	3	—
8-16-16	2,163	537	7	8-12-12	107	146	—
4-12-4	1,669	66	9	6-4-6	82	5	—
0-14-14	1,359	596	11	8-12-16	66	35	—
10-10-10	1,224	487	—	10-6-4	48	42	—
5-15-10	584	1	—	7-11-5	43	26	—
8-6-2	577	205	10	4-8-4	38	16	—
3-12-6	572	—	—	6-8-6	26	90	—
3-12-12	426	212	—	6-7-4	23	20	—
4-12-8	406	18	7	4-8-0	12	—	—
8-6-4	401	172	5	7-8-5	10	5	—
5-15-15	340	195	—	4-4-2	10	30	—
6-10-4	321	58	6	8-16-8	—	11	—
5-10-3	281	—	—	Miscellaneous	46	39	—
4-12-16	279	131	—	TOTALS	58,401	8,792	229
9-7-4	233	110	—				

*The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1 to December 31, 1950

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Superphosphate.....	2,257	1,227	11
Process tankage and activated sewage.....	1,668	1,203	—
Pulverized animal manures.....	1,411	570	30
Nitrate of soda.....	1,267	488	—
Cottonseed meal.....	759	438	—
Bone meal.....	730	286	15
Ammonium nitrate.....	420	263	—
Muriate of potash.....	397	200	6
Sulfate of ammonia.....	301	31	9
Cyanamid.....	205	17	—
Castor pomace.....	192	74	—
Rock phosphate.....	160	120	—
Urea compounds.....	86	3	—
Dry ground fish.....	86	—	—
Linseed meal.....	28	24	—
Horn and hoof meal.....	17	40	—
Miscellaneous.....	3	—	—
TOTALS.....	9,988	4,954	101

MIXED FERTILIZERS

Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With No Deficiencies	Totals	Less than 1/4 Per Cent Below Guarantee	Between 1/4 and 1/2 Per Cent Below Guarantee	Between 1/2 and 3/4 Per Cent Below Guarantee	More than 3/4 Per Cent Below Guarantee
Adco Works.	1	1	3	0	0	0	0
American Agricultural Chemical Co.	50	33	148	10	5	3	1
Apothecaries Hall Co.	11	11	33	0	0	0	0
Armour Fertilizer Works.	14	10	42	2	1	1	0
Associated Seed Growers, Inc.	1	1	3	0	0	0	0
Joseph Breck & Sons Corp.	3	2	10	1	0	0	0
Central Chemical Corp.	2	0	6	1	0	0	1
Consolidated Rendering Co.	15	13	45	1	1	0	0
Davison Chemical Corp.	4	4	12	0	0	0	0
Doggett-Pfeil Co.	1	1	3	0	0	0	0
Eastern States Farmers' Exchange, Inc.	15	11	55	2	1	1	0
Essex County Cooperative Farming Association.	3	3	10	0	0	0	0
Excell Laboratories.	1	1	3	0	0	0	0
Facey & Besthoff, Inc.	1	1	3	0	0	0	0
Fama Bureau Assn.	6	6	18	0	0	0	0
Fox Point Chemical Co.	6	2	19	2	1	0	1
Frank's Market Garden.	1	1	3	0	0	0	0
Frost & Higgins Co.	1	1	3	0	0	0	0
C. L. Halvorson Tree Service.	1	0	3	1	0	0	0
A. H. Hoffman, Inc.	1	1	3	0	0	0	0
Hydroponic Chemical Co., Inc.	1	1	3	0	0	0	0
Hy-Trous Corp.	1	1	3	0	0	0	0
International Minerals & Chemical Corp.	25	18	89	4	2	0	1
Lexington Gardens, Inc.	1	1	3	0	0	0	0
Miller Chemical & Fertilizer Corp.	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	24	22	73	0	1	1	0
Olds & Whipple, Inc.	10	10	32	0	0	0	0
F. G. Phillips Co.	1	1	3	0	0	0	0
Plantabbs Corp.	2	2	6	0	0	0	0
Rogers & Hubbard Co.	20	18	59	1	1	0	0
Rose Manufacturing Co.	1	1	3	0	0	0	0
O. M. Scott & Sons Co.	2	2	6	0	0	0	0
Sears, Roebuck & Co.	7	5	21	1	0	0	1
M. L. Shoemaker Div. of Wilson & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	2	1	6	1	0	0	0
Swift & Co. Plant Food Division.	3	1	9	0	1	0	1
Tennessee Corp.	2	1	6	1	0	0	0
Universal Chemical Co.	1	1	3	0	0	0	0
C. P. Washburn Co.	3	3	9	0	0	0	0
TOTALS.	246	194	764	28	14	6	6

EXPLANATION OF TABLE OF ANALYSES

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers that meet their guarantees in every respect, this table includes also a list of those mixtures that have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

This table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers that carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Showing a Commercial Shortage of \$1 or More per Ton

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Approximate Commercial Shortage Per Ton
	Water Insoluble Organic	Total			
American Agricultural Chemical Co.					
AA Quality 8-16-16,	—	7 22	15 44	15 34	\$4.08
Agrico for Tobacco 6-3-6, . . .	2.35	5 37	3.07	6.56 <i>a</i>	6.08

a Potash in forms other than muriate. See table of "Mixtures Substantially Complying with Guarantees."

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Adco Works		
Vivo 17-34-16.....	1	—
American Agricultural Chemical Co.		
AA Quality Fertilizer 0-12-18.....	1	—
AA Quality Fertilizer 0-14-14.....	6	—
AA Quality Fertilizer 3-12-6.....	1	—
AA Quality Fertilizer 3-12-12.....	1	—
AA Quality Fertilizer 4-12-4.....	7	—
AA Quality Fertilizer 5-8-7.....	5	—
AA Quality Fertilizer 5-10-5.....	1	—
AA Quality Fertilizer 5-10-10.....	6	—
AA Quality Fertilizer 7-7-7.....	1	—
Agrico Phosphate & Potash 0-12-18.....	1	—
Agrico Phosphate & Potash 0-14-14.....	2	—
Agrico for Grain 3-12-6.....	1	—
Agrico for Seeding Down 3-12-12.....	1	—
Agrico for Corn 4-12-4.....	3	—
Agrico for New England 5-8-7.....	4	—
Agrico Rose Food 5-9-6.....	1	—
Agrico for Gardens 5-10-5.....	1	—
Agrico for Onions 5-10-5.....	2	—
Agrico for Truck 5-10-5.....	1	—
Agrico for Potatoes 5-10-10, 2% magnesium oxide.....	4	—
Agrico for Tobacco 6-3-6 (a).....	1 b	2.42
Agrico for Tobacco 6-3-6 (c).....	1 b	2.49
Agrico Country Club Fertilizer 6-10-4.....	1	.46
Agrico for Lawns, Trees & Shrubs 6-10-4.....	1	.64
Agrico for Cranberries 7-7-7.....	1	—
Agrico for Top Dressing 7-7-7.....	4	—
Agrico Country Club 8-6-2.....	2	1.45
Apothecaries Hall Co.		
Liberty Fertilizer 4-12-4.....	1	—
Liberty High Grade Market Garden 5-8-7.....	2	—
Liberty Fertilizer 5-10-5.....	1	—
Liberty Fertilizer 5-10-10.....	2	—
Liberty Fertilizer 5-10-10, 2% magnesium oxide.....	1	—
Liberty Tobacco Mixture 6-3-6.....	2 b	3.15
Liberty Special for Fruit & Grass 7-7-7.....	2	—
Armour Fertilizer Works		
Armour's Big Crop 0-14-14.....	1	—
Armour's Big Crop 5-8-7.....	1	—
Armour's Big Crop 5-10-5.....	1	—
Armour's Big Crop 5-10-10.....	1	—
Armour's Big Crop 5-10-10 with Sulphur.....	1	—
Armour's Big Crop 5-10-10, 2% magnesium oxide.....	1	—
Armour's Big Crop Tobacco Special 6-3-6.....	2 b	2.19
Armour's Big Crop 7-7-7.....	1	—
Armour's Big Crop 8-16-16.....	1	—
Armour's Big Crop 10-10-10.....	1	—
Armour Vertagreen Plant Food 5-10-5.....	1	—
Armour Vertagreen Plant Food 6-12-12.....	1	—
Armour Vertagreen Plant Food 10-6-4.....	1	1.83
Associated Seed Growers, Inc.		
Japedizer 8-6-4.....	1	1.64
Joseph Breck & Sons Corp.		
Breck's Country Club 8-6-2.....	1	.53
Brexone Garden-Gro 5-10-10, 2% magnesium oxide.....	1	—
Brexone Turf-Gro 8-6-2.....	1	50
Central Chemical Co		
Farmrite Gardenrite 5-10-5.....	1	—
Farmrite Rose Food 7-8-5.....	1	78
Consolidated Rendering Co.		
Corenco 0-14-14 Top Dresser.....	1	—
Corenco 4-12-4 Complete Manure.....	1	—
Corenco 4-12-16 Ladino Special.....	1	—
Corenco 5-8-7 Potato & General Crop.....	1	—
Corenco 5-10-5 Home Garden.....	1	—
Corenco 5-10-5 Onion Special — Super Truck.....	1	—
Corenco 5-10-10 Peerless Potato.....	1	—

a Stock carried over from previous season.

b Potash in forms other than muriate.

c See Table of "Mixtures Showing a Commercial Shortage of \$1 or More per Ton."

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Consolidated Rendering Co. (continued)		
Corenco 5-10-10, 2% magnesium oxide	1	—
Corenco 6-3-6 Premium Tobacco Grower	1 <i>b</i>	2.10
Corenco 6-3-6 Special Tobacco Grower	1 <i>b</i>	3.65
Corenco 6-8-8 Potato Special	1	—
Corenco 7-7-7 Complete Fruit & Top Dressing	2	—
Corenco 8-6-4 Landscape	1	—
Corenco 8-16-16 Two in One	1	—
Davison Chemical Corp.		
5-8-7 Davco Granulated Fertilizer	1	—
5-10-5 Davco Granulated Fertilizer	1	—
5-10-5 Turf Food Davco Granulated Fertilizer (Premium)	1	—
5-10-10 Davco Granulated Fertilizer	1	—
Doggett-Pfeil Co.		
D & P Rose Food 5-8-3	1	2.40
Eastern States Farmers' Exchange, Inc.		
Eastern States 0-19-19 with 5% Borax	1	—
Eastern States 0-20-20	1	—
Eastern States 5-10-10, 1% magnesium oxide	1	—
Eastern States 5-15-15, 1% magnesium oxide	2	—
Eastern States 6-4-6 Tobacco, 2% magnesium oxide	1 <i>b</i>	3.29
Eastern States 8-4-8 Tobacco, 2% magnesium oxide	1 <i>b</i>	3.47
Eastern States 8-12-12 L. C. S., 2% magnesium oxide	1 <i>d</i>	—
Eastern States 8-12-12, 2% soluble magnesium oxide	2	—
Eastern States 8-16-8, 1% magnesium oxide	1	—
Eastern States 8-16-16, 1% magnesium oxide	2	—
Eastern States 10-10-10, 1% magnesium oxide	1	—
Eastern States Plant Starter 10-52-17	1	—
Essex County Cooperative Farming Association		
S-X Brand 5-10-10	1	—
S-X Brand 5-10-10, 2% soluble magnesium oxide	1	—
S-X Brand 7-7-7	1	—
Excell Laboratories, Inc.		
New Plant Life 2-1-2	1	—
Faesy & Bcsthoff, Inc.		
Rose Food 8-10-4	1	—
Farm Bureau Association		
Farm Bureau 4-12-8	1	—
Farm Bureau 4-16-20	1	—
Farm Bureau 5-8-7	1	—
Farm Bureau 5-10-10	1	—
Farm Bureau 7-7-7	1	—
Farm Bureau 8-6-2	1	64
Fox Point Chemical Co.		
Old Fox Brand 4-12-8	1	—
Old Fox Brand 5-8-7	2	—
Old Fox Brand 5-10-10, 1% magnesium oxide	1	—
Old Fox Brand 7-7-7	1	—
Old Fox Brand Turf Fertilizer 8-6-2	1	.23
Frank's Market Garden		
For More Growth FMG .9-9-9	1	.58
Frost & Higgins Co.		
Special Tree and Shrub Food 8-6-4	1	.92
C. L. Halvorson Tree Service		
Halvorson Tree Food 8-6-2	1	1.55
A. H. Hoffman, Inc.		
Hoffman Rose Food 5-10-5	1	1.82
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19	1	—
Hy-Trous Corp.		
Hy-Trous 4-8-4	1	—

b Potash in forms other than muriate.

d Potash: 4.38% muriate, 8.52% other forms.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
International Minerals & Chemical Corp.		
International 0-14-14.....	2	—
International 0-20-20.....	1	—
International 4-12-16 1% magnesium oxide.....	1	—
International 5-8-7 1% magnesium oxide.....	3	—
International 5-10-5 1% magnesium oxide.....	2	—
International 5-10-10 1% magnesium oxide.....	2	—
International Potato 5-10-10 2% soluble magnesium oxide.....	3	—
International 5-10-10 5% soluble magnesium oxide.....	2	—
International Tobacco 6-3-6.....	2 <i>b</i>	2.76
International 7-7-7 1% magnesium oxide.....	4	—
International Fruit 7-7-7 3% soluble magnesium oxide.....	1	—
International Lawn 8-6-2.....	1	.72
International 8-16-16.....	2	—
International 10-10-10 1% magnesium oxide.....	1	—
Lexington Gardens, Inc.		
Luxuro Plant Food 5-10-3.....	1	2.01
Miller Chemical & Fertilizer Corp.		
Miller VHPF 6-25-15.....	1	—
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 0-14-14.....	1	—
Old Deerfield 0-20-20.....	1	—
Old Deerfield 4-12-8.....	1	—
Old Deerfield 5-5-15 Tobacco Starter.....	1 <i>b</i>	—
Old Deerfield 5-8-7 All Crop.....	3	—
Old Deerfield 5-8-7 2% magnesium oxide, potash other than muriate.....	1 <i>b</i>	—
Old Deerfield 5-10-5 Trucker's Special.....	1	—
Old Deerfield 5-10-10 Potato.....	1	—
Old Deerfield 5-10-10 2% magnesium oxide, potash other than muriate.....	2 <i>b</i>	—
Old Deerfield 6-3-6 Complete Tobacco.....	5 <i>b</i>	3.55
Old Deerfield Complete Tobacco 6-4-7.....	1 <i>b</i>	3.78
Old Deerfield Lawnshrub 6-5-5.....	1	1.13
Old Deerfield 7-7-7 Grass Top Dressing.....	2	—
Old Deerfield 8-8-8.....	2	—
Old Deerfield 8-16-16.....	1	—
Olds & Whipple, Inc.		
O & W 5-3-5 Complete Tobacco Potash from Cotton Hull Ash, 0.13% Copper Sulphate.....	1 <i>b</i>	2.63
O & W 5-8-7 Potato & General Purpose.....	1	—
O & W 5-10-5 2% magnesium oxide.....	1	—
O & W 5-10-10 Potato.....	1	—
O & W 5-10-10 Potato, 2% magnesium oxide.....	1	—
O & W 6-3-6 Blue Label Tobacco, Potash from Cotton Hull Ash.....	3 <i>b</i>	3.23
O & W 7-7-7 Top Dressing & Grass.....	2	—
F. G. Phillips Co.		
Ferti-Flora 3-3-3.....	1	—
Plantabbs Corp.		
Fulton's Plantabbs 11-15-20.....	2	—
Rogers & Hubbard Co.		
Gro-Fast Plant Food 5-10-5.....	1	1.35
Hubbard Alfalfa Fertilizer 0-14-14.....	1	—
Hubbard Seeding 3-12-12.....	1	—
Hubbard Corn Fertilizer 4-12-4.....	1	—
Hubbard Tobacco Starter 5-5-15.....	1 <i>b</i>	1.54
Hubbard Potato 5-8-7.....	1	1.35
Hubbard Vegetable 5-8-7.....	1	—
Hubbard Garden 5-10-5.....	1	—
Hubbard General Crop 5-10-10.....	2	—
Hubbard High Potash 5-10-10.....	1 <i>a</i>	1.25
Hubbard Tobacco Grower 6-3-6.....	3 <i>b</i>	3.16
Hubbard 6-8-8 for Potatoes.....	1	.68
Hubbard Top Dressing 7-7-7.....	2	—
Hubbard Golf Course 8-6-2.....	1	1.71
Hubbard Double Strength 8-16-16.....	1	—
Hubbard Valley Brand 6-3-6.....	1 <i>b</i>	3.06

a Stock carried over from previous season.

b Potash in forms other than muriate.

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Rose Manufacturing Co.		
Triogen Rose Food 5-10-5.....	1	—
O. M. Scott & Sons Co.		
Scotts Turf Builder 9-7-4.....	1	2.28
Scotts Weed & Feed 7-11-5.....	1	3.50
Sears, Roebuck & Co.		
Cross Country Berry Food 10-6-4.....	1	—
Cross Country Bulb Food 5-10-5.....	1	—
Cross Country Evergreen Food 5-10-5.....	1	1.18
Cross Country Lawn Food & Weed Killer 5-10-5.....	1	—
Cross Country Liquid Plant Food 10-5-5.....	1	—
Cross Country Plant Food 5-10-5.....	1	—
Cross Country Rose Food 5-10-5.....	1	1.58
M. L. Shoemaker Division of Wilson & Co., Inc.		
Shoemaker's "Swift-Sure" 4-10-0.....	1	.74
Smith Agricultural Chemical Co.		
Sacco Plant Food 4-12-4.....	1	—
Wedo, with 2,4-D, 6-10-4.....	1	—
Swift & Co. Plant Food Division		
Brimm for Potatoes & Special Truck Crops 5-10-10.....	1	—
Red Steer 10-6-4.....	1	—
Vigoro 5-10-5.....	1	—
Tennessee Corp.		
Loma 5-10-5.....	1	—
Loma 8-8-8 Mineralized.....	1	—
Universal Chemical Co.		
Electra Plant Food 5-10-3.....	1	1.97
C. P. Washburn Co.		
Washburn's Market Garden 5-8-7.....	1	—
Washburn's Special Potato 5-10-10.....	1	—
Washburn's 7-7-7.....	1	—

NITROGEN COMPOUNDS

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
American Agricultural Chemical Co.		
Agrinite.....	{ 8.31 8.81	8.25 8.25
American Cyanamid Co.		
Aero Cyanamid 20.6%.....	20.60	20.60
Aeroprills Ammonium Nitrate.....	33.89	33.50
Barrett Division, Allied Chemical & Dye Corp.		
A-N-L Brand Fertilizer Compound.....	21.30	20.50
Arcadian the American Nitrate of Soda.....	16.06	16.00
Central Chemical Corp.		
Farmrite Sulphate of Ammonia.....	20.96	20.50
Chilean Nitrate Sales Corp.		
Chilean Nitrate of Soda — Champion Brand.....	{ 16.14 16.25 16.20 ^a	16.00 16.00 16.00
E. I. du Pont de Nemours & Co.		
Du Pont NuGreen Fertilizer Compound.....	44.55	44.00
Eastern States Farmers' Exchange, Inc.		
Sulphate of Ammonia.....	21.18	20.50
Horn & Supply Co., Inc.		
Processed Horn & Hoof Meal.....	14.74	15.00
International Minerals & Chemical Corp.		
Sulphate of Ammonia.....	21.10	20.56
Old Deerfield Fertilizer Co., Inc.		
Sulphate of Ammonia.....	21.18	20.50
Sears, Roebuck & Co.		
Cross Country Sulphate of Ammonia.....	20.90	20.00
Synthetic Nitrogen Products Corp.		
Cal-Nitro Fertilizer Compound.....	20.80	20.50

^a Composite of 3 samples.

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
American Agricultural Chemical Co.				
Agrico Bone Meal.....	1.50	1.50	31.72	25.00
Armour Fertilizer Works				
Armour's Bone Meal.....	2.63	2.30	26.21	23.00
Centra' Chemical Corp.				
Farmrite Bone Meal.....	2.76	2.30	26.93	20.00
Consolidated Rendering Co.				
Corenco Ground Bone.....	1.23	1.50	31.37	27.00
Corenco Ground Bone.....	1.57	2.00	28.87	23.00
Essex Products Co.				
Fertilizer Bone Meal.....	4.71	3.60	21.52	23.00
Faesy & Besthoff, Inc.				
Pure Bone Meal.....	2.56	2.47	28.82	23.00
A. H. Hoffman, Inc.				
Hoffman Bone Meal (Raw).....	3.91	3.70	20.55	20.00
International Minerals & Chemical Corp.				
International Bone Meal.....	3.03	2.47	23.51	23.00
Old Deerfield Fertilizer Co., Inc.				
Old Deerfield Dry Ground Fish.....	9.88	9.00	7.37	5.00
John Reardon & Sons Division of Wilson & Co., Inc.				
Rearco Ground Bone.....	1.39	2.00	31.77	18.00
Rogers & Hubbard Co.				
Gro-Fast Bone Meal.....	{ 2.91 3.95	{ 2.00 2.00	{ 27.13 22.85	{ 23.00 23.00
N. Roy & Son				
Animal Tankage.....	7.17	7.00	12.88	8.00
Sears, Roebuck & Co.				
Cross Country Bone Meal.....	2.35	2.00	26.98	20.00
Sewerage Commission of the City of Milwaukee				
Milorganite (a).....	6.01	6.00	3.75	—

a Available phosphoric acid found, 3.15%; guaranteed 2%.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
AA Quality Phosphate Rock.....	32.33 <i>a</i>	—	—
18% Normal Superphosphate.....	{ 18.66 <i>b</i> 19.07	18.00 18.49	18.00 18.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%.....	22.24	20.48	20.00
Consolidated Rendering Co.			
Corenco Superphosphate 20%.....	{ 20.55 20.66	20.53 20.28	20.00 20.00
Davison Chemical Corp.			
Davco Granulated 20% Superphosphate.....	21.62	20.56	20.00
Eastern States Farmers' Exchange, Inc.			
Superphosphate 20%.....	21.98	20.02	20.00
Farm Bureau Association			
Farm Bureau Superphosphate 20%.....	20.66	20.38	20.00
Fox Point Chemical Co.			
Old Fox Superphosphate 20%.....	20.45	20.41	20.00
International Minerals & Chemical Corp.			
International Superphosphate 20%.....	21.83	20.18	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield Superphosphate 20%.....	21.27	21.11	20.00
Rogers & Hubbard Co.			
Superphosphate 20%.....	20.91	20.59	20.00

a Guaranteed 30% total phosphoric acid.

b Composite of 3 samples.

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
Eastern States Farmers' Exchange, Inc.....	61.40	60.00
International Minerals & Chemical Corp.....	61.20	60.00
Old Deerfield Fertilizer Co., Inc.....	61.60	60.00

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash
American Agricultural Chemical Co.			
Agri-co Sheep Manure (1.25-1-2).....	{ 1.44	1.33	2.92
	{ 1.54	1.48	3.28
Armour Fertilizer Works			
Pulverized Sheep Manure (1.5-1-2).....	1.54	1.46	2.07
Atkins & Durbrow, Inc.			
Driconure (2-1-1).....	3.24	2.55	1.83
Central Chemical Corp.			
Farmrite Cow Manure (2-1-1).....	2.23	1.46	2.52
Farmrite Sheep Manure.....	1.15	1.12	2.66
Consolidated Rendering Co.			
Corenco Poultry Manure (2-2-2).....	3.08	4.93	2.78
Corenco Sheep Manure (2-1-2).....	2.00	1.66	2.94
Corenco Spurz-On (3.5-3.5-1.5).....	4.75	4.01	3.75
Davison Chemical Corp.			
Sheep Manure (2-1-2).....	1.29	1.61	2.58
A. H. Hofman, Inc.			
Hofman Cow Manure (2-1-1).....	2.00	1.41	2.43
Hofman Poultry Manure (3-1-1).....	3.66	4.52	2.08
Hofman Sheep Manure (1.5-1-2).....	1.50	1.16	3.65
International Minerals & Chemical Corp.			
International Sheep Manure (1.25-1-2).....	1.50	1.46	2.34
Norwood Brand Fertilizer Co.			
Norwood Brand Sheep Manure Screened from Wool (1.5-.35-2.75).....	1.77	.36	2.94
Rogers & Hubbard Co.			
Gro-Fast Cow Manure (2-1-1).....	2.00	1.31	2.02
Gro-Fast Sheep Manure (1.25-1-2).....	1.25	1.00	2.55
Sears, Roebuck & Co.			
Cross Country Cattle Manure (1.5-.75-2).....	1.77	1.33	1.85
Cross Country Cattle Manure (1.5-1-2).....	1.33	1.26	3.36
Cross Country Sheep Manure (1.5-.75-2).....	1.95	1.41	2.61
Cross Country Sheep Manure (1.5-1-2).....	1.30	1.20	2.74
Wendell S. Stitt			
Farmmanure (2-1-1).....	3.88	2.40	2.08
Swift & Co. Plant Food Division			
Pulverized Sheep Manure (2-1-2).....	1.57	1.38	2.88
Walker-Gordon Laboratory Co.			
Bovung (2-1-1).....	2.28	1.63	2.80

AGRICULTURAL LIME PRODUCTS

Explanation of Table of Analyses

"Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "percent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "percent" column by 20.

"Insoluble matter" represents material that is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical Analysis" the figures represent the percentage of product that would pass or be retained by the meshed sieves mentioned.

Agricultural Lime Products

Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter	Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton		Finer than 100-mesh	Coarser than 20-mesh
Central Chemical Corporation									
Farmite Hydrate Lime.....	70.6	72	1.3	.75	71.9	1438	.3	—	—
Conklin Limestone Co., Inc., Canaan, Conn.									
High Magnesium Agricultural Ground Limestone.....	27.40	30	18.1	18.0	51.6	1032	14.1	61.31	25
A. H. Hoffman, Inc.									
Hoffman Hydrated Lime.....	66.2	70	1.9	1.0	68.2	1364	.2	—	—
Hoosac Valley Lime Co., Inc.									
Adams Land Lime.....	57.9	56	1.1	.5	59.3	1186	1.5	—	—
Hoosac Agricultural Limestone.....	54.3	54	.6	.5	55.5	1110	1.9	96.4	none
Lee Lime Corporation									
Lee Double Strength Agricultural Hydrated Lime.....	47.3	45	34.4	30.0	92.0	1840	.9	—	—
Lee Hydrated Lime for General Purposes.....	46.2	45	34.3	30.0	90.8	1816	none	—	—
Lee Pulverized Limestone.....	31.1	30	21.8	20.0	59.8	1196	1.5	60.1	5.7
Tobey Agra Hydrate.....	40.4	35	28.9	25.0	77.9	1558	1.3	—	—
New England Lime Co.									
Nelco Agricultural Hydrated Lime (Adams).....	73.5	70	1.5	.5	75.2	1504	.1	—	—
Nelco Agricultural Hydrated Lime (Canaan, Conn.).....	48.2	47	35.2	31.0	93.5	1870	.5	—	—
Nelco Agricultural Limestone (Adams).....	47.1	47	34.7	31.0	92.3	1847	1.5	—	—
Nelco Agricultural Ground Limestone (Canaan, Conn.).....	53.5	53.5	1.4	.4	55.2	1104	2.5	82.4	none
Nelco Agricultural Ground Limestone (Canaan, Conn.).....	30.3	30	21.3	21.0	58.2	1164	5.2	75.4	7.1
Nelco Land Lime (Canaan, Conn.).....	30.9	30	22.0	21.0	60.5	1210	2.0	71.6	3.0
Nelco Land Lime (Canaan, Conn.).....	46.4	35	31.2	25.0	89.0	1780	1.5	—	—
Nelco Land Lime (Canaan, Conn.).....	41.7	35	28.2	25.0	79.9	1598	1.7	—	—
United States Gypsum Co.									
Red Top General Purpose Hydrated Lime.....	71.0	70	1.3	trace	72.8	1456	none	—	—
Red Top Hydrated Agricultural Lime.....	71.9	70	1.8	trace	73.3	1466	.5	—	—
USG Agricultural Limestone.....	53.0	50.5	1.0	.25	53.9	1078	7.0	81.4	none
Vermont Associated Lime Industries, Inc.									
Green Mountain Handy Hydrated Lime.....	65.3	60	5.0	1.0	72.1	1442	2.8	—	—

DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE IN MASSACHUSETTS IN 1951

- Adco Works, Carlisle, Penn.
 American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St. at St. Clair, Marietta, Ohio
 Apothecaries Hall Co., 28 Benedict St., Waterbury 88, Conn.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2, Minn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
 Associated Seed Growers, Inc., Milford, Conn.
 Atkins & Durbrow, Inc., 165 John St., New York 38, N. Y.
- Barrett Division, Allied Chemical & Dye Corporation, 40 Rector St., New York 6, N. Y.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Joseph Breck & Sons Corporation, 401 Summer St., Boston 10, Mass.
 Buell Fertilizer Co., Exeter, N. H.
- Central Chemical Corporation, Lebanon, Penn.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
- Davey Tree Expert Co., 117 South Water St., Kent, Ohio
 Davison Chemical Corporation, Charles & Fayette Sts., Baltimore 3, Md.
 Doggett-Pfeil Co., 642 Morris Turnpike, Springfield, N. J.
 Doughton Seed Co., 151 Twelfth St., Jersey City, N. J.
 E. I. du Pont de Nemours & Co., Wilmington, Del.
- Eastern States Farmers' Exchange, Inc., 26 Central St., West Springfield, Mass.
 Essex County Cooperative Farming Association, Topsfield, Mass.
 Essex Products Co., 581 Boylston St., Boston, Mass.
 Excell Laboratories, Inc., 2732 Indiana Ave., Chicago, Ill.
- Faes & Besthoff, Inc., 325 Spring St., New York 13, N. Y.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
 Fox Point Chemical Co., 49 Valley St., East Providence, R. I.
 Frank's Market Garden, 1398 Allen St., Springfield, Mass.
 Frost & Higgins Co., 20 Mill St., Arlington 74, Mass.
- Garfield Williamson, Inc., 1072 Westside Ave., Jersey City, N. J.
- C. L. Halvorson Tree Service, 150 North St., Pittsfield, Mass.
 Heeman Manufacturing Co., 515 Palmer St., Wooster, Ohio
 A. H. Hoffman, Inc., Landisville, Penn.
 Hoover Soil Service, Gilman, Ill.
 Horn & Supply Co., Inc., 190 Central St., Leominster, Mass.
 Humphreys-Godwin Co., 2246 Park Ave., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., Copley, Ohio
 Hy-Trous Corp., 50 Cross St., Winchester, Mass.
- International Minerals & Chemical Corp., Woburn, Mass.
- Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
- Lexington Gardens, Inc., Lexington, Mass.
- McCormick & Co., Inc., McCormick Bldg., Baltimore 2, Md.
 Miller Chemical & Fertilizer Corp., 1000 S. Caroline St., Baltimore 31, Md.
- Norwood Brand Fertilizer Co., Mt. Vernon St., North Reading, Mass.
- Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.
- F. G. Phillips Co., 255 Cedar St., Dedham, Mass.
 Plantabbs Corp., 1 West Biddle St., Baltimore 1, Md.
 Premier Peat Moss Corp., 535 Fifth Ave., New York 17, N. Y.
 Pulverized Manure Co., 503 Exchange Bldg., Chicago 9, Ill.
- Ra-Pid-Gro Corp., 88 Ossian St., Dansville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 Rose Manufacturing Co., 6 Main St., Beacon, N. Y.
 N. Roy & Son, South Attleboro, Mass.
 Rumm Phosphate & Chemical Co., 8 South Michigan Ave., Chicago 3, Ill.
- Saratoga Laboratories, Hope, N. J.
 O. M. Scott & Sons Co., Marysville, Ohio
 Sears, Roebuck & Co., 925 South Homan Ave., Chicago 7, Ill.
 Sewage Commission of the City of Milwaukee, Milwaukee 1, Wis.
 M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave. and Venango St., Philadelphia 34, Penn.
 Smith Agricultural Chemical Co., 618 North Champion Ave., Columbus 16, Ohio

Wendell S. Still, Middle Country Road, Selden, N. Y.
Stimuplant Laboratories Co., 791 South Lazelle St., Columbus, Ohio
Stockdale Fertilizer Co., Morris, Ill.
Swift & Company Plant Food Division, 25 Faneuil Hall Sq., Boston 9, Mass.
Synthetic Nitrogen Products Corp., 285 Madison Ave., New York 17, N. Y.

Tennessee Corp., Lockland, Cincinnati 15, Ohio
Tennessee Corp., East Point, Ga.
Thomson Phosphate Co., 407 South Dearborn St., Chicago 5, Ill.

Universal Chemical Co., Lynn, Mass.

Walker-Gordon Laboratory Co., Plainsboro, N. J.
C. P. Washburn Co., Middleboro, Mass.
Woodruff Fertilizer Works, Inc., North Haven, Conn.
F. H. Woodruff & Sons, Inc., Milford Conn.

DIRECTORY OF MANUFACTURERS WHO REGISTERED AGRICULTURAL LIME PRODUCTS FOR SALE IN MASSACHUSETTS IN 1951

Central Chemical Corp., Lebanon, Penn.

Conklin Limestone Co., Inc., Canaan, Conn.

Conklin Limestone Co., Inc., R.F.D. Saylesville, R. 1

A. H. Hoffman, Inc., Landisville, Penn.

Hoosac Valley Lime Co., Inc., Adams, Mass.

Kelley Island Lime & Transport Co., 1122 Leader Bldg., Cleveland 14, Ohio

Lee Lime Corp., Lee, Mass.

Limestone Products Corporation of America, 122 Main St., Newton, N. J.

New England Lime Co., Adams, Mass.

United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.

Vermont Associated Lime Industries, Inc., Winooski, Vt.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 151

NOVEMBER 1951

Seed Inspection

BY SEED CONTROL SERVICE STAFF

This report, the twenty-fourth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1951 by authority of Chapter 94 as amended by Chapter 377 of the Acts of 1946.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The following regulations and fees have been approved by the Director of the Massachusetts Agricultural Experiment Station.

FIELD CROPS:	KIND OF SEED	PURITY ONLY	GERMINATION ONLY	PURITY AND GERMINATION
Alfalfa, Rape, Ryegrasses, Soybeans, Timothy.....		\$1.00	\$0.50	\$1.25
Cereals, Buckwheat, Sudan Grass, Vetches.....		1.25	.50	1.50
Clovers, Fescues, Reed Canary Grass.....		1.00	.50	1.50
Brome Grass, Millets.....		1.50	.50	2.00
Bentgrasses, Bluegrasses, Orchard Grass, Redtop...		2.00	.50	2.25
Redtop (Unhulled).....		2.50	.50	2.75

Mixtures: Lawn, Pasture, Mowing, etc.

Purity only..... \$2.50

Germination only..... .50 for each component

Purity and Germination..... 2.50 ± .50 for each component

Special Mixtures: Consisting of two kinds of cereals, two kinds of clover only, or Timothy and one kind of clover

Purity only..... \$1.25

Germination only..... .50 each

Purity and Germination..... 2.00

Vegetables: Germination tests for all kinds of vegetable seeds, 30 cents each.

Cleaning Tobacco Seed: For each lot of one pound or less, based on the weight of seed as received for cleaning, 50 cents.

Kinds of Seed Not Listed: Fees for testing and for other seed determinations not listed will be based on the time consumed in making the test or for other service requested.

Free Tests: During any one calendar year, the Seed Testing Laboratory will allow two free tests of vegetable or tobacco seed to any person residing or doing business in the Commonwealth.

The minimum weights of samples to be submitted for analysis are:

- a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.
- b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.
- c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any kind to be submitted for a germination test is 400.

Samples should be taken so as to represent correctly the lot sampled, each placed in a strong container, the parcel of samples securely wrapped and addressed to **Seed Laboratory, Agricultural Experiment Station, Amherst, Mass.**

Checks or Money Orders must be made payable to the University of Massachusetts and sent to the Seed Laboratory.

In no case will the final report for work done be rendered until all fees are paid.

SEED INSPECTION FOR THE SEASON OF 1951

By Seed Control Service Staff:

F. A. McLaughlin, *Associate Research Professor in Charge*

Jessie L. Anderson, *Assistant Professor*
Waldo C. Lincoln, Jr., *Laboratory Assistant*
A. Warren Clapp, *State Inspector*¹

Mrs. Phyllis Russell, *Laboratory Assistant*
William Martin, Sr., *Laboratory Helper*
May J. Honnay, *Senior Clerk*

Massachusetts Vegetable Seed Standards for 1952

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations, and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing, and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>)....	60	Kale.....	75
Asparagus.....	70*	Kohlrabi.....	75
Bean, Lima.....	70	Leek.....	60
Bean, Scarlet Runner.....	75	Lettuce.....	80
Bean, Other Varieties.....	75	Muskmelon.....	75
Beet.....	65	Mustard.....	75
Broccoli.....	75	Okra.....	*50
Brussels Sprouts.....	70	Onion.....	70
Cabbage.....	75	Parsley.....	60
Cabbage, Chinese.....	75	Parsnip.....	60
Carrot.....	55	Peas.....	80
Cauliflower.....	75	Pepper.....	55
Celeriac.....	55	Pumpkin.....	75
Celery.....	55	Radish.....	75
Chard, Swiss.....	65	Rhubarb.....	60
Chicory.....	65	Rutabaga.....	75
Citron.....	65	Salsify.....	75
Collard.....	80	Sorrel.....	60
Corn, Sweet.....	75	Soybean.....	75
Cress, Garden or Curled.....	40	Spinach, Common.....	60
Cress, Water.....	35	Spinach, New Zealand.....	40
Cucumber.....	80	Squash.....	75
Dandelion.....	45	Tomato.....	75
Egg Plant.....	60	Tomato, Husk.....	50
Endive.....	70	Turnip.....	80
Fetticus (Corn Salad).....	70	Watermelon.....	70

*Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds and the percentage of hard seed, if present, must be stated.

¹Employed by the State Department of Agriculture

1951 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1950, to November 1, 1951, the Seed Laboratory received 6497 samples of seed, of which 1302 were collected by the State Department of Agriculture and 5195 were sent in by seedsmen, farmers, and various state institutions.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 6497 samples was 414 for purity and 7203 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
292 Field Crops for Purity and Germination.....	292	292
513 Field Crops for Germination Only.....	.....	513
113 Lawn Mixtures for Germination Only; Germinations involving 521 ingredients.....	.....	521
104 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 420 ingredients	104	420
18 Lawn Mixtures for Purity Only.....	18	.....
4979 Vegetables for Germination Only.....	.....	4979
24 Tree Seeds for Germination Only.....	.....	24
94 Tobacco Seeds for Germination Only.....	.....	94
324 Flower Seeds for Germination Only.....	.....	324
36 Weed Seeds for Germination Only.....	.....	36
<hr/> 6497	<hr/> 414	<hr/> 7203

Field tests to determine trueness to type were conducted under the supervision of the Departments of Olericulture and Floriculture, which tested 300 samples of vegetable seeds and 298 samples of flower seeds, respectively.

The Seed Laboratory cleaned 94 lots of tobacco seed for Connecticut Valley farmers. The gross weight of the tobacco seeds was 60.08 pounds, and the net weight for the cleaned seed was 46.97 pounds.

Explanation of Tables

Tables 1 through 5 consist of data in conformity with requirements of the Seed Law defined by Chapter 94 as amended by Chapter 377 of the Acts of 1946:

Table 1. Results of Inspection and Analyses of Field Seeds as defined under Sections 261 B1 and 261 C.

Table 2. Results of Inspection and Analyses of Mixtures of Agricultural Seeds as defined under Sections 261 B1 and 261 C.

Table 3. Results of Inspection and Germination of Vegetable Seeds as defined under Sections 261 B2 and 261 C.

Table 4. Field Tests of Vegetable Seeds, Type and Variety Studies, as defined under Sections 261 H.

Table 5. Studies of Flower Seeds, Laboratory and Field Tests to Determine Quality, as defined under Sections 261 H.

Table 6. Summary, by wholesalers, of the total number of samples tested, showing how many were correctly labeled and how many were mislabeled.

All samples were taken by an inspector from the State Department of Agriculture and were tested at the Seed Laboratory according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

Within each table the wholesalers are listed in alphabetical order, and the various kinds of seeds sold by them follow the same alphabetical arrangement. Mislabeled and other irregularities are emphasized by boldface type and explained in the final column of the table. The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F," what was found in the laboratory analysis.

Results of Inspection and Analyses of Field Seeds—Sections 261 B1 and 261 C.

Each lot of Agricultural Seeds must be labeled to show the commonly accepted name and variety, except for Barley, Buckwheat, Oats, Rye, and Wheat. When the variety is unknown, the label shall bear the statement: "Variety Unknown." The label must also show lot number or other identification; percentage, by weight, of pure seed; percentage, by weight, of inert matter; percentage, by weight, of weed seeds; percentage, by weight, of other agricultural seeds; percentage of (a) germination, exclusive of hard seeds, (b) hard seeds, if present; month and year germination test was completed; origin of Alfalfa, Red Clover, and Field Corn (other than Hybrid), except if origin is unknown, it must be so stated; name and address of the person who labeled the seed, or who sells, offers, or exposes such seed for sale, and the names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams and 1 in 10 grams of the smaller seeds, and per pound when present in excess of 1 in 25 grams and 1 in 100 grams of the larger seeds. Secondary noxious weeds are dodder (*Cuscuta spp.*), horse nettle (*Solanum carolinense*), wildmustards (*Brassica spp.*), wild garlic and wild onion (*Allium spp.*), perennial sow thistle (*Sonchus arvensis*), corncockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*). Seed is prohibited from sale for having a false or misleading label, unless the test for germination has been completed within a nine months period or if it contains primary noxious weed seeds in excess of tolerance. Primary noxious weeds are Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and quack grass (*Agropyron repens*).

Two hundred and fifty-one samples of field crop seeds were analyzed in the laboratory. Results of analysis, however, are given only for samples which were mislabeled. In this table, complete analysis is recorded; but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Table 1

Lab No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
282	Timothy	Arthur R. Conc, Inc., Buffalo, N. Y. D. Harbeck & Son, New Bedford No. 10 x 965	L 99.75 F 99.78	0.08 0.08	0.15 0.09	0.02 0.05	90.00 91.00	10/1950 6/1951	Noxious weeds not declared, but 30 Buckhorn Plantain per oz. found
802	Vetch	Sunshine Feed Store, Bridgewater Spring, No. 70-40	L 98.69 F 97.31	0.01 0.00	1.06 1.00	0.24 1.69	92.00 96.00	1/1951 5/1951	Purity below that stated. Other Crop Seed excessive.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued

845	Birdsfoot Trefoil	Weld & Beck Co., Southbirdge No. 42-45.....	L F	98.88 97.85	0.10 0.08	0.02 0.25	1.00 1.82	80.2 75.8	1/1951 7/1951	Purity below that stated. Other Crop Seed excessive.
1076	Alsike Clover	Craver-Dickinson Seed Co., Buffalo, N. Y. Bisbee Bros., Co., Williamsburg No. 21-446.....	L F	97.50 95.45	0.27 0.46	0.94 1.88	1.29 2.21	81.9 78-13	3/1951 7/1951	Purity below that stated. Inert Matter excessive. Other Crop Seed excessive.
1100	Bluegrass	Doughten Seed Co., Jersey City, N. J. Frank Howard, Inc., Pittsfield Canada, No. B-302.....	L F	85.00 84.83	0.38 0.33	14.02 11.12	0.60 3.72	80.00 85.00	1/1951 5/1951	Other Crop Seed excessive.
S-977	Timothy	Wm. G. Scarlett Co., Baltimore, Md. Danvers State Hospital, Danvers No. 121.....	L F	99.74 99.15	0.10 0.24	0.16 0.57	0.00 0.04	96.00 92.00	12/1950 5/1951	9 Buckhorn Plantain per oz. de- clared, but 42 per oz. found. Noxious weeds excessive.
1104	Clover	Frank Howard, Inc., Pittsfield Red, No. 437.....	L F	99.30 99.59	0.40 0.10	0.25 0.22	0.05 0.09	85.5 85.7	12/1950 7/1951	Noxious weeds not declared, but 19 Buckhorn Plantain per oz. found.
S-274	Rye	Medfield State Hospital, Medfield Rosen, No. 413.....	L F	98.50 99.77	0.20 0.03	1.00 0.12	0.50 0.08	92.00 94.00	12/1950 4/1951	4 Buckhorn Plantain per oz. declared clared, but 14 Quack grass and 2 Corn Cockle per lb. found. Primary Noxious Weeds excessive. Sale prohibited.
S-254	Clover	Northampton State Hospital, Northampton Ladno, No. 633.....	L F	99.67 99.59	0.10 0.09	0.23 0.27	0.00 0.05	90.3 95.2	1/1951 4/1951	40 Buckhorn Plantain declared, but 93 per oz. found.
S-258	Oats	Clinton, No. 13762.....	L F	99.00 99.45	0.10 0.01	0.90 0.53	0.00 0.01	90.00 80.00	12/1950 4/1951	Germination below that stated.
S-257	Timothy	No. 121.....	L F	99.74 99.15	0.10 0.21	0.16 0.30	0.00 0.34	96.00 85.00	12/1950 4/1951	Germination below that stated.

Table 1.—Results of Inspection and Analyses of Field Seeds—Continued

Lab No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
Wm. G. Scarlett & Co., (Continued)										
1191	Barley	C. H. Symmes & Co., (Scarlett Warehouse) Winchester **Spring; No. 8935.	L F	99.00 99.90	0.20 0.00	0.70 0.04	0.10 0.06	90.00 48.00	12/1950 7/1951	**Variety required unless there is a statement "Variety Unknown." "Spring" is not a variety. Germination below that stated.
1185	Rye	Rosen, No. 14146.	L F	98.30 98.12	0.20 0.26	1.00 0.55	0.50 1.07	92.00 83.00	12/1950 7/1951	4 Buckhorn and 20 Corn Cockle lb. declared, but 80 Corn Cockle and 67 Quack grass per lb. found. Germination below that stated. Primary Noxious Weeds excessive. Sale prohibited.
1186	Rye	Resen, No. 413. Origin—Michigan	L F	98.30 98.80	0.20 0.21	1.00 0.24	0.50 0.75	92.00 88.00	12/1950 7/1951	4 Buckhorn and 20 Corn Cockle per lb. declared, but 94 Corn Cockle and 53 Quack grass per lb. found. Primary Noxious Weeds excessive. Sale prohibited.
1190	Vetch	Hairy, No. 83. Origin—Oregon	L F	99.00 98.12	0.10 0.02	0.20 0.00	0.70 1.86	90.00 83-7	3/1951 6/1951	Purity below that stated. Other Crop Seed excessive.
1157	Buckwheat	C. P. Washburn & Co., Middleboro Japanese, No. 14102. Origin—Delaware	L F	98.00 99.85	0.50 0.00	1.50 0.15	0.00 0.00	85.00 57.50	1/1951 6/1951	Germination below that stated.
1152	Corn	Lancaster Sure Crop, No. 1528. Origin—Pennsylvania	L F	99.00 99.73	0.20 0.00	0.80 0.27	0.00 0.00	80.00 65.00	5/1951 6/1951	Germination below that stated.

1122	Corn	Stanford Seed Co., Buffalo, N. Y. W. N. Potter Grain Store, Shelburne Falls Cornell 29-3-Certified, No. O-HC-II Origin—New York	L F	99.95 99.98	0.00 0.00	0.05 0.02	0.00 0.00	98.00 90.00	12/1950 5/1951	Germination below that stated.
1123	Corn	Golden Nugget, No. 5847 Origin—Pennsylvania	L F	99.00 99.57	0.00 0.00	1.00 0.43	0.00 0.00	85.00 72.00	5/1951 5/1951	Germination below that stated.
841	Clover	Southbridge Grain Co., Southbridge Ladino, No. 3270	L F	99.00 98.77	0.30 0.50	0.15 0.60	0.55 0.12	70-20 72-19	2/1951 6/1951	Noxious weeds not declared, but 63 Buckhorn and one Dodder per oz. Inert Matter excessive.

Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Sections 261 B1 and 261 C.

Each mixture of Agricultural Seeds shall be labeled to show the commonly accepted name and variety of each agricultural seed component in excess of five percent of the whole and the percentage, by weight, of each in the order of its predominance. The word "mixture" or the word "mixed" shall be shown conspicuously on the label. Other label requirements for Mixtures are the same as those for Field Seeds; hence are not repeated here since they will be found under Table 1.

Forty-seven Mixtures were received, but only 17 were found to vary sufficiently from the label requirements to justify the statement of complete analysis in this table. Items which are mislabeled, also the name and address of the wholesaler, are printed in boldface type.

Table 2.

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components %		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks			
		Label	Found								Label	Found	
942	The Clapper Co., West Newton, Mass. Shady Lawn Mixture, No. 1.....				L 97.39	0.53	7.62	0.21	1 1951	Percentage exceeds that stated.			
		Components:			F	0.27	2.21	0.13	5/1951				
		Kentucky Bluegrass.....	25.50	32.68	80.00	81.00							
		Perennial Ryegrass.....	19.74	18.12	95.00	95.00							
		Chewings Fescue.....	19.70	24.20	90.00	85.00							
		Poa Trivialis.....	12.03	7.97	80.00	65.00							
		Meadow Fescue.....	9.85	8.12	91.00	70.00							
		Colonial Bent.....	4.82	6.30	90.00	86.00							
		Arthur R. Conc, Inc., Buffalo, N. Y.					L 94.77	0.90	4.05		0.70	2/1951	Germination below that stated. Percentage below that stated. Germination below that stated.
		D. Harbeck & Son, New Bedford					F	0.71	4.05		0.47	4/1951	
		280	Pacemaker Lawn Mixture, No. 38 x 384.....										
				Components:									
				Domestic Ryegrass.....	34.65	32.32	90.00	92.00					
Timothy.....	29.40			30.17	80.00	86.00							
Meadow Fescue.....	13.50			13.96	78.00	60.00							
Kentucky Bluegrass.....	8.00			8.52	75.00	82.00							
Redtop.....	6.80			7.51	85.00	86.00							
White Clover.....	2.00			2.29	65.20	63.19							

Doughten Seed Co., Jersey City, N. J.
 Mass. Department of Public Works, Middleboro
 S-1149 Special Lawn Mixture, No. 120851

L	85.29	0.80	19.48	4.61	2/1951
F		0.78	13.79	0.14	6/1951

Inert Matter excessive.

Components:					
Red Fescue	49.80	40.07	80.00	93.00	
Redtop	18.40	20.79	90.00	82.00	
Kentucky Bluegrass	17.00	18.36	80.00	81.00	
Domestic Ryegrass	.....	6.07	.....	88.00	

Not declared, but 6.07% found.

1282 Mass. Hardware & Supply Co., Waltham
 Green Acres, No. 1151-PMA-195

L	84.37	0.50	11.50	0.50	3/1951
F		0.29	14.90	0.44	6/1951

Inert Matter excessive.

Components:					
Common Ryegrass	76.90	75.51	90.00	95.00	
Timothy	6.50	7.45	75.00	81.00	
Bluegrass	4.00	1.41	65.00	39.00	

Percentage below that stated.
 Germination below that stated.
 "Bluegrass" not sufficient.
 Kentucky Bluegrass found.

1124 D. Landreth Seed Co., Philadelphia, Pa.
 H. Newell & Co., Sheburne Falls
 Evergreen Lawn Mixture, No. 115

L	84.83	0.52	11.14	2.56	1/1951
F		0.84	11.59	2.74	5/1951

Germination below that stated.

Components:					
Redtop	25.76	24.48	90.00	87.00	
Kentucky Bluegrass	18.14	17.91	80.00	80.00	
Perennial Ryegrass	14.92	14.27	90.00	89.00	
Domestic Ryegrass	12.98	13.02	90.00	89.00	
Timothy	11.40	11.95	90.00	65.00	
White Dutch Clover	2.58	3.20	84.15	84.9	

Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label Found	Label Found							
John D. Lyon, Inc., Cambridge, Mass.										
Metropolitan District Commission, Cambridge										
S-1321	Special Lawn Mixture, Lot No. (*)				L 98.24 F 92.97	0.18 0.29	0.68 6.62	0.90 0.12	4/1951 6/1951	*Required information not given. Components not listed in order of predominance. Inert Matter excessive. Percentage below that stated. **Not Highland Colonial Bent but a mixture of Highland Colonial Bent and Redtop. Percentage exceeds that stated. Germination below that stated.
	Components:									
	Kentucky Bluegrass.....	14.40	8.18	85.00						
	**Highland Colonial Bent.....	14.77	....	95.00						
	Domestic Ryegrass.....	24.75	34.30	90.00						
	Illahaee Creeping Fescue.....	44.32	37.42	95.00						
	Agrostis spp. ....	....	13.07	....					
	(Redtop and Highland Bent)									
Northampton State Hospital, Northampton										
S-1128	Special Lawn Mixture, Lot No. (*)				L 86.18 F 86.18	0.45 0.07	2.60 13.47	0.28	*/ 5/1951	*Required information not given. Components not listed in order of predominance. Inert Matter excessive. Germination below that stated. Percentage below that stated. Percentage exceeds that stated. Percentage below that stated.
	Components:									
	Kentucky Bluegrass.....	12.90	7.73	80.00						
	Chewings Fescue.....	9.80	5.88	90.00						
	Domestic Ryegrass.....	49.50	57.62	90.00						
	Choice Timothy.....	24.70	14.95	90.00						

Charles J. McCullough Seed Co., Cincinnati, Ohio

1298 Ross Bros. Co., Worcester
Canada Bluegrass, No. A-1534 (**)
(Origin-Iowa)

Components:
Canada Bluegrass..... 78.88 72.09 90.00 88.00
Kentucky Bluegrass..... 8.76 90.00

The Page Seed Co., Greene, N. Y.

1668 Haley's Grain Store, Palmer
Alsike Clover, No. L-51551 (**)
(Origin-Ohio)

.....L 97.90 0.05 0.15 1.90
.....F 99.22 0.04 0.66 0.08

Components:
Alsike Clover..... 97.90 87.42 81-9 **67-19**
Sweet Clover..... 11.80 10-24

Perry Seed Co., Boston, Mass.

638 Franklin Park Lawn Mixture, Lot No. (*)

.....L
.....F 90.29

Components:

Kentucky Bluegrass..... 37.80 38.09 80.00 85.00
Redtop..... 37.20 38.77 90.00 **63.00**
Clewings Fescue..... 10.20 8.36 85.00 86.00
White Dutch Clover..... 4.80 5.07 80-12 76-8

J. B. Rice, Jr., Inc., Shushan, N. Y.

725 C. A. Methe Co., Westfield
Shady Lawn Mixture, No. 1822-4, AMS 1

.....L
.....F 97.03

Components:

Common Ryegrass..... 44.00 41.12 90.00 90.00
Creeping Red Fescue..... 29.40 29.37 75.00 74.00
Timothy..... 14.80 17.05 90.00 86.00
Kentucky Bluegrass..... 8.40 9.49 80.00 **65.00**

1/1951
6/1951

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**Found to be a mixture of
Canada and Kentucky Bluegrass.

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7/1951

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**Found to be a mixture of
Clover and Sweet Clover.

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*Required information not given.

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Germination below that stated.

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Germination below that stated.

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Germination below that stated.

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Germination below that stated.

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0.05

0.70
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Table 2.—Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Continued

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer when other than Wholesale Distributor and Place Collected	Components %		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label Found	Label Found							
<p>Wm. G. Scarlett & Co., Baltimore, Md. Metropolitan District Commission, Medford S-1145 Special Lawn Mixture, No. 14160.....L F</p>										
	Components:									
	Chewings Fescue.....	33.25	34.57	85.00	87.89	0.40	7.85	0.10	4/1951	Inert Matter excessive. Other Crop Seed excessive.
	Kentucky Bluegrass.....	29.75	25.12	85.00					5/1951	
	Redtop.....	23.75	22.79	90.00						
	White Clover.....	4.90	5.41	80.00						
	State Farm, South Bridgewater Japanese Buckwheat, No. 13949 (**) (Origin—Pennsylvania).....L F				99.92	0.01	0.06	0.01	12/1950 6/1951		**Found to be a mixture of Japanese Buckwheat and Tartary Buckwheat.
S-1160	Components:									
	Japanese Buckwheat.....	99.80	92.22	94.00						Germination below that stated.
	Tartary Buckwheat.....	.....	7.70	.....					
<p>Stanford Seed Co., Buffalo, N. Y. Cutler Grain Co., Framingham Liberty Lawn Mixture, No. 5001 F.....L F</p>										
174	Components:									
	Domestic Ryegrass.....	22.77	21.70	90.00	86.91	0.80	11.24	0.90	2/1951	Germination below that stated. Germination and hard seeds not stated separately.
	Kentucky Bluegrass.....	20.40	19.90	80.00					4/1951	
	Timothy.....	15.84	16.98	85.00						
	Red Fescue.....	14.08	14.40	85.00						
	Redtop.....	9.97	9.81	85.00						
	White Dutch Clover.....	4.00	4.12	80.00						

1173	Culter Grain Co., Continued Shady Spot Lawn Mixture, No. 5004 F.	L	89.21	0.80	10.92	0.90	2/1951
		F		0.64	10.08	0.07	4/1951
	Components:						
	Perennial Ryegrass.....	24.94	26.09	90.00	97.00		
	Red Fescue.....	20.17	20.15	85.00	96.00		
	Timothy.....	17.80	17.42	85.00	92.00		
	Kentucky Bluegrass.....	12.25	14.30	80.00	64.00		Germination below that stated.
	Redtop.....	8.52	7.58	85.00	80.00		
	Poa Trivialis.....	3.70	3.67	80.00	75.00		
1197	Vaughan's Seed Store, New York, N. Y. C. H. Symmes & Co., Winchester Columbia Lawn Mixture, No. 5121.	L	93.08	0.25	8.88	0.19	1/1951
		F		0.51	6.22		6/1951
	Components:						
	Kentucky Bluegrass.....	25.50	24.83	80.00	84.00		
	Poa Trivialis.....	11.70	11.80	90.00	70.00		Components not listed in order of predominance.
	Creeping Red Fescue.....	20.09	18.15	90.00	86.00		
	Redtop Fancy.....	33.58	38.30	90.00	86.00		Germination below that stated.
1184	Whitney Seed Co., Buffalo, N. Y. Farm Bureau Assoc., Waltham F. B. Hayland No. 1, Lot No. (*)	L	98.98	0.30	0.45	0.15	2, 1951
		F		0.34	0.34	0.34	6/1951
	Components:						
	Timothy.....	49.30	48.77	90.00	90.00		
	Red Clover.....	29.70	29.70	78-12	86-12		
	Alsike Clover.....	19.60	20.17	72-18	84-10		
	Ladino Clover.....	0.50	0.34	70-12	55-42		Germination below that stated.

Results of Inspection and Germination of Vegetable Seeds Sections 261 B2 and 261 C.

Each separate container of Vegetable Seeds must be labeled to show plainly the kind of seed and variety and the name and address of the person who labeled such seed or who sells, offers, or exposes it for sale. For seeds which germinate less than the Massachusetts Standard, the label must also show the percentage of germination exclusive of hard seeds, percentage of hard seeds if present, calendar month and year the test was completed, and the words "Below Standard" in not less than 8-point type. Date of test shall not be over nine months old, exclusive of the month in which the test was completed. Seed may not be sold or offered for sale which has a false or misleading label.

Seven hundred and four samples of vegetable seeds were received and tested in the laboratory; however, this table includes only those samples that were found to be mislabeled with respect to requirements of law

The wholesaler's name, in all instances, and the germination for those samples of seed found below standard in germination are in boldface type. In samples for which the found germination is not in boldface, the germination is above standard but below germination stated.

Table 3.

Lab. No	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %	
			Given		Found			
			%	Date of Test	%	Month of Test		
1053	Leek	Henry A. Dreer, Inc., Philadelphia, Pa. Dreer Shipping Center, Boston Giant Musselburgh.....			3	5/1951	60	
784	Onion	Thomas J. Grey Co., Abington White Globe.....			11	5/1951	70	
122	Lettuce	Bud D. Hawkins, Reading, Vt. I. B. Barrows & Co., Worcester Grand Rapids Forcing.....	80	12/1950	19	4/1951	80	
1136	Lettuce	A. E. Stewart Estate, Lee Ea. Curled Simpson.....	80	12/1950	61	5/1951	80	
1137	Lettuce	Big Boston.....	80	12/1950	62	5/1951	80	
1132	Onion	White Portugal.....	70	12/1950	35	5/1951	70	
1126	Turnip	D. Landreth Seed Co., Philadelphia, Pa. H. Newell & Co., Shelburne Falls Snowball.....	85	1951	63	6/1951	80	
1337	Onion	The Page Seed Co., Greene, N. Y. Centre Hardware Co., Uxbridge Large Red Wethersfield.....	70	1/1951	25	6/1951	70	
661	Celery	Joseph Sordillo & Sons, Boston, Mass. Boston.....			28	5/1951	55	
655	Chicory	Large Rooted.....			40	5/1951	65	
654 F	Turnip	Flat White.....			20	5/1951	80	
165	Peas	Vaughan's Seed Store, New York, N.Y. Brown Grain Co., Concord Worlds Record, No. 8873.....		App. 90	1951	58	5/1951	80
S-79	Dandelion	F. H. Woodruff & Sons, Milford, Conn. Taunton State Hospital, Taunton Arlington Thick Leaf, No. 9-212-3	90	10/1950	66	4/1951	45	
S-984 F	Bean	S. D. Woodruff & Sons, Orange, Conn. Danvers State Hospital, Danvers Sure Crop, No. 941206.....	85	12/1950	75	5/1951	75	
1303	Cabbage	Worcester Grain Co., Worcester, Mass. Danish Ballhead.....		1949	63	6/1951	75	
1304	Onion	Yellow Globe Danvers.....			0	6/1951	70	

FIELD TESTS OF VEGETABLE SEEDS
Type and Variety Studies

Conducted by the Seed Laboratory
Waldo C. Lincoln, Jr., Laboratory Assistant
Under the Supervision of W. H. Lachman, Assistant Research Professor
Department of Olericulture

This is the sixteenth year that the Experiment Station has conducted tests to determine the trueness-to-type of various kinds of vegetable seed offered for sale in this State. The State Seed Inspector purchased 300 samples of beans, beets, broccoli, cabbage, carrots, Chinese cabbage, corn, radishes, rutabagas, and turnips for trial in the field test plots in order to compare plant characteristics with the labeled variety name. The 300 samples tested were taken at 76 retail establishments and represent the products of 33 seedsmen who wholesale seed in this State. All lots were hand-seeded in twenty-foot rows, and later thinned to the desired distances. Planting was done May 23, 25, 28, and 29, and growing conditions were good throughout the tests.

Conformity to type was the measure of comparison in the tests, and individual plants were called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration. Field trials were not conducted for the purpose of recording yields but several observations in this connection were noted for Top Crop and Tendergreen beans. In all instances the beans tested were 100 percent true to name, but the same variety from different sources gave widely different yields. In the variety Top Crop, the high producing strain yielded 65 percent more by weight than the poorest producing strain. Comparative figures for Tendergreen indicate a difference of 100 percent.

Performance for the ten kinds of vegetables grown this year is recorded as follows:

	No. Lots	No. Lots Off-Type	Total % Off-Type	10% or better Off-Type
Beans	48	0	0	0
Beets	30	14	46	5
Broccoli	16	1	6	0
Cabbage	41	17	41	7
Chinese Cabbage	2	0	0	0
Corn	59	2	3	1
Carrot	36	8	22	3
Radish	24	13	52	4
Rutabaga	15	6	42	1
Turnip	29	12	40	6

In general the seed tested this year conformed very well to type as stated. Of the 73 lots which showed at least one percent or better off-type, only 3 were 50 percent or more off-type, and only 27 were 10 percent or more off-type. Stated in another way, only 9 percent of the 300 lots were over 10 percent off-type.

Table 4
Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Growers, Inc., Milford, Conn.				
11 F	Cabbage	W. G. Pearse & Co., Fall River Improved Savoy.....	96	4% triple headed
15 F	Radish	Early Scarlet Globe.....	93	3% bolted to seed—4% tapered root
Joseph Breck & Sons, Boston, Mass. Stoneham Paint & Hardware Co., Stoneham				
957 F	Beet	Crosby's Egyptian, No. 530536....	88	12% tapered shape
958 F	Carrot	Danvers Half Long.....	98	2% yellow
W. Atlee Burpee Co., Philadelphia, Pa. American Hardware Co., Lawrence				
376 F	Beet	Crosby's Egyptian, No. 111.....	96	4% tapered shape
375 F	Radish	French Breakfast, No. 907.....	86	14% purple colored — uniformity lacking
C. B. Coburn Co., Lowell				
393 F	Carrot	Burpee's Improved Long Orange..	84	16% off-type (short stubby root)
397 F	Turnip	Purple Top White Globe.....	88	8% Purple Top Strap leaf— 4% all white
D'Arruda's General Store, Somerset				
183 F	Cabbage	Early Jersey Wakefield.....	92	8% double headed
Harding Street Grain Co., Worcester				
666 F	Beet	Crosby's Egyptian, No. 7501.....	92	8% blunt oblong shaped
Palm Grain Co., Lowell				
378 F	Corn	Marcross No. 1.....	85	15% off-type—Golden Bantam
Shoffield Hardware Co., No. Attleboro				
302 F	Carrot	Tendersweet.....	85	15% short blunt ended
301 F	Radish	Sparkler.....	92	6% 2/3 white—2% Long Scarlet Short Top
Comstock, Ferre & Co., Wethersfield, Conn.				
720 F	Beet	Bryan Hardware Co, Westfield Detroit Dark Red.....	94	6% Crosby's Egyptian type
W. G. Pearse & Co., Fall River				
17 F	Cabbage	Golden Acre.....	90	10% off-type
Arthur R. Cone, Inc., Buffalo, N. Y. Danvers State Hospital, Danvers				
S-982 F	Rutabaga	Long Island Improved, No. 254..	95	5% Bristol White
Massachusetts Reformatory, Concord				
S-152 F	Turnip	Purple Top White Globe, No. 196..	97	3% all white
Taunton State Hospital, Taunton				
S-85 F	Cabbage	Glory of Enkhuizen, No. 378.....	85	15% Flat Dutch
S-89 F	Turnip	Purple Top White Globe, No. 195..	93	7% all white
Crosman Seed Corp., Rochester, N. Y. Neisner Bros., Inc., Holyoke				
919 F	Cabbage	Copenhagen Market.....	85	15% double headed
Eastern States Farmers' Exchange, West Springfield, Mass. Eastern States Farmers' Exchange, Taunton				
144 F	Beet	Crosby's Early Wonder.....	98	2% pink skinned
136 F	Chinese Cabbage	Michihili, No. G 610.....	100	Tendency toward double headedness
139 F	Rutabaga	Bristol White.....	88	12% double top
Ferry-Morse Seed Co., Detroit, Mich. Adams Hardware, Inc., Dorchester				
947 F	Cabbage	Early Jersey Wakefield.....	95	5% triple headed
954 F	Rutabaga	American Purple Top.....	92	8% New Sweet Germain

Table 4
Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Ferry-Morse Seed Co.—(Continued)				
604 F	Radish	Jordan Marsh Co., Boston Early Scarlet Globe.....	84	12% cylindrical shape — 4% mottled pink flesh
Fredonia Seed Co., Fredonia, N. Y.				
1083 F	Radish	Kirk General Store, Dalton Early Scarlet White Tip.....	95	5% white color
Rocky's Hardware Co., Springfield				
890 F	Carrot	Improved Long Orange.....	96	4% yellow color
891 F	Rutabaga	American Purple Top.....	96	4% triple top
892 F	Turnip	Purple Top White Globe.....	0	Is not a Purple Top White Globe. It is a Purple Top Strap Leaf
Thomas J. Grey Co., Abington				
787 F	Radish.	Early Scarlet Globe.....	82	18% cylindrical to tapered shape
Joseph Harris Co., Rochester, N. Y.				
616 F	Radish	Joseph Harris Co., Lexington Cavalier.....	94	6% long cylindrical shap
Charles C. Hart Seed Co., Wethersfield, Conn.				
113 F	Cabbage	Fullam Hardware Co., Brookfield Drumhead Savoy.....	95	5% rutabagas
Community Feed Stores, East Long- meadow				
877 F	Radish	White Tipped Scarlet, No. 4792..	98	2% purple color
C. V. Hayes, Bridgewater				
23 F	Turnip	Red Top Globe, No. 4471.....	88	4% Golden Ball—8% Purple Top Strap Leaf—remainder not uniform, poor strain
Pierce Hardware Co., Taunton				
100 F	Beet	Detroit Dark Red, No. 4205.....	82	18% blunt oblong shape — tops too large for Detroit type
42 F	Cabbage	Copenhagen Market, No. 4626....	95	5% off-type—apparently Penn State Ball Head
41 F	Cabbage	Golden Acre, No. 4213.....	50	50% off-type (several types)
43 F	Cabbage	Premium Late Flat Dutch, No. 4676.....	95	5% Golden Acre
35 F	Turnip	Red Top Strap Leaf Flat, No. 4339	92	4% all white—4% all purple
Sargent Grain & Supply Co., Brockton				
760 F	Carrot	Touchon B.....	98	2% yellow fleshed
D. Landreth Seed Co., Philadelphia, Pa.				
Smith Mills Hardware Co., Dartmouth				
773 F	Turnip	Large White or Pomeranian.....	96	4% Purple Top White Globe
Michael Leonard Seed Co., Chicago, Ill.				
Hamilton & Atwater Co., Westfield				
707 F	Turnip	Purple Top White Globe, No. 830012.....	92	8% white
Northrup, King & Co., Minneapolis, Minn.				
La Palm Hardware Co., Webster				
838 F	Turnip	Purple Top Strap Leaf.....	84	12% all white—4% all purple
F. W. Woolworth Co., Holyoke				
909 F	Cabbage	Allhead Early.....	90	5% Danish Ball Head—5% Copenhagen Market

Table 4
Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
The Page Seed Co., Greene, N. Y.				
194 F	Cabbage	J. H. Fairbanks Co., Bridgewater Early Jersey Wakefield.....	94	6% double headed
Pelleted Seed Co., Wynnewood, Pa.				
327 F	Cabbage	Joseph Breck & Sons, Boston Copenhagen Market, No. P 193..	95	5% double headed
329 F	Radish	Scarlet Globe.....	95	5% mottled pink flesh; Short Top type
Perry Seed Co., Boston				
628 F	Beet	Crosby's Egyptian, Special Strain	98	2% light pink skinned
636 F	Radish.	Scarlet Globe, No. 5845.....	96	4% cylindrical shaped
J. B. Rice, Jr., Inc., Shushan, N. Y.				
Deslongchamp & Stetson Grain Store, Palmer				
740 F	Broccoli	Italian Green Sprouting.....	95	5% off-type (light green leaf)
738 F	Cabbage	Copenhagen Market.....	95	5% double headed
744 F	Rutabaga	American Purple Top.....	95	5% double top
736 F	Turnip	Purple Top Strap Leaf.....	70	30% all white
Ross Bros. Co., Worcester				
208 F	Beet	Detroit Dark Red, No. 3147....	96	4% Crosby type
Sears, Roebuck & Co., Chicago, Ill.				
Sears, Roebuck & Co., Lawrence				
367 F	Radish	French Breakfast, No. 4281.....	94	6% olive shaped
Joseph Sordillo & Sons, Boston, Mass.				
653 F	Cabbage	Danish Ballhead.....	88	12% off-type (Flat Dutch)
651 F	Radish	Red Oval.....	96	4% pink color skin
654 F	Turnip	Flat White.....	0	100% off-type (Purple Top White Globe)
Vaughan's Seed Store, New York, N. Y.				
Brown's Grain Co., Concord				
168 F	Beet	Crosby's Special, No. 14771.....	88	4% Crosby's Egyptian—8% Detroit Dark Red
F. H. Woodruff & Sons, Milford, Conn.				
Farm Bureau Assoc., Inc., Worcester				
227 F	Beet	Detroit Dark Red.....	90	6% Crosby's Egyptian type— 4% tapered root—tops taller than Detroit Dark type
231 F	Rutabaga	Long Island Improved, No. 4-112	92	8% Double top
230 F	Turnip	Purple Top White Globe, No. 36642.....	92	4% all white—4% Purple Top Strap Leaf
General Mills, Fall River				
128 F	Beet	Woodruff's Early Wonder.....	96	4% tapered root
130 F	Corn	Whipple's Early Yellow, No. 27634	95	5% off-type
The Manchester Co., Easthampton				
705 F	Carrot	Improved Long Orange, No. 37369	94	6% yellow
Merrimac Nurseries, Haverhill				
961 F	Beet	Asgrow Wonder, No. 25185 C....	86	14% tapered shape
960 F	Cabbage	Golden Acre, No. 9-26 C.....	90	10% Turnips
Sargent Grain & Supply Co., Brockton				
756 F	Beet	Woodruff's Early Wonder, No. 34323.....	98	2% blunt oblong shape
Spence Hardware & Supply Co., Methuen				
351 F	Carrot	Hutchinson, No. 1-724 C.....	84	4% yellow—12% Chantenay Red Cored

Table 4
Field Tests of Vegetable Seeds—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer when other than Wholesale Distributor, and Place Collected	True to Type %	Remarks
F. W. Woodruff & Sons — Continued)				
S-49 F	Beet	Worcester State Hospital, Worcester Woodruff's Early Wonder, No. 1-211.....	96	4% tapered root
S-47 F	Radish	Early Scarlet Globe Med Top.....	94	6% tall cylindrical shape—tops
S. D. Woodruff & Sons, Orange, Conn.				
975 F	Cabbage	Haverhill Hardware & Plumbing Supply Co., Haverhill Early Jersey Wakefield.....	95	5% off-type
967 F	Carrot	Chantenay Red Cored.....	96	4% long tapered type

STUDIES OF FLOWER SEEDS

Conducted by the Seed Laboratory

Waldo C. Lincoln, Jr., Laboratory Assistant

Under the Supervision of

Clark L. Thayer, Professor, Department of Floriculture

This is the sixteenth year in which flower seed studies have been conducted by the Seed Laboratory to determine the quality of flower seeds offered for sale in various retail outlets. Seed of 298 lots, representing 42 genera, packeted by 22 wholesalers or distributors, were obtained from 62 retail sources by the Seed Inspector. Four lots of *Ipomoea* and 16 perennials were collected but were not tested.

The lots were distributed among the various genera as follows:

Ageratum.....	13	Delphinium.....	7	Nicotiana.....	3
Alyssum.....	23	Dianthus.....	4	Papaver.....	1
Anchusa.....	3	Didiscus.....	2	Petunia.....	26
Antirrhinum.....	3	Dimorphotheca.....	2	Phlox.....	4
Calendula.....	9	Eschscholtzia.....	4	Portulaca.....	7
Calliopsis.....	2	Gaillardia.....	1	Reseda.....	3
Callistephus.....	22	Gypsophila.....	4	Salvia.....	4
Celosia.....	4	Helichrysum.....	3	Scabiosa.....	8
Centaurea.....	20	Iberis.....	4	Taetetes.....	24
Cleome.....	3	Impatiens.....	4	Tithonia.....	2
Convolvulus.....	1	Kochia.....	3	Tropaeolum.....	7
Cosmos.....	16	Lobelia.....	1	Verbena.....	4
Cynoglossum.....	2	Lupinus.....	2	Vinca.....	1
Daisy.....	1	Mirabilis.....	1	Zinnia.....	40

Dates of sowing were June 4, 5, and 6. Seeds were sown in twenty-foot sections in the row and in most cases, because of the small quantity of seed in a packet, it required the entire package of seed to plant the section; in a few lots there were not enough seeds in a packet to plant the twenty-foot section.

Germination tests were made in the laboratory for all samples of seed tested in the field, except for those having insufficient seed. The results of laboratory germination are indicated in the tables only for those samples that were recorded as giving poor germination in the field. The coordination of stands in the field with laboratory germination was found to be excellent.

Results of field germination were rated as "good" if seeds germinated in approximately two-thirds of the row; "fair," between one-third and two-thirds; "poor," for less than one-third. Performance was designated as "satisfactory" if the varieties were true to name, regardless of the number of plants, with only one-third or less of the plants not true to form or color; "fair," between one-third and two-thirds not true; and "not satisfactory" if less than one-third was true to name. Lots that did not produce sufficient plants for providing satisfactory data are so indicated.

Weather during the period of germination in the field was excellent and remained good during the entire growing season.

Table 5
Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Germination	Field Tests
				Performance
Joseph Breck & Sons, Boston, Mass.				
821	Alyssum	Blizzard.....	Fair	Satisfactory
822 F	Alyssum	Carpet of Snow.....	Good	Satisfactory
820 F	Alyssum	Violet Queen.....	Good	Satisfactory
823 F	Antirrhinum	Cherry Ripe.....	Good	Satisfactory
825 F	Calliopsis	Golden Crown.....	Good	Satisfactory
819 F	Callistephus	Early Giant Mixed.....	Good	Satisfactory
826 F	Callistephus	Princess Mixed.....	Good	Satisfactory
824 F	Centaurea	Blue Boy.....	Good	Satisfactory
829 F	Convolvulus	Dwarf Royal Ensign.....	Good	Satisfactory
828 F	Cosmos	Sensation White.....	Good	Satisfactory
830 F	Cosmos	Sensation Pink.....	Good	Satisfactory
827 F	Dianthus.....	Breck's Geisha Girl.....	Good	Satisfactory
815 F	Nicotiana	Sensation—New Color Blend.....	Good	Satisfactory; 6 colors
814 F	Petunia.....	Dwarf Bedding Admiral.....	Good	Satisfactory
816 F	Petunia	Silver Medal.....	Fair	Satisfactory
818 F	Portulaca	All Double Blend.....	Good	Satisfactory; 9 colors; 8% single
816 F	Petunia	Silver Medal.....	Fair	Satisfactory
817 F	Scabiosa	Dwarf Heavenly Blue.....	Good	Satisfactory
812 F	Tagetes	Yellow Supreme.....	Good	Satisfactory
813 F	Tagetes	Double Flowered Harmony Hybrid	Good	50% off-type; Same flower as Melody, but taller habit of growth
811 F	Tagetes	Single French Red Head.....	Good	Satisfactory
833 F	Tithonia	Torch, No. 3950.....	Good	Satisfactory
832 F	Verbena	Salmon King, No. 4026.....	Fair	Satisfactory
831 F	Zinnia	Crown of Gold-Pastel Shades.....	Good	Satisfactory
834 F	Zinnia	Defiance-Spun Gold, No. 4382.....	Good	4% Pink Fantasy
835 F	Zinnia	Dwarf Defiance Rose Pink, No. 4378.....	Good	Satisfactory
J. H. Chandler & Co., Newton Centre				
534 F	Ageratum	Blue.....	Good	Satisfactory
533 F	Alyssum	Little Gem.....	Good	Completely mislabeled; is Alyssum Maritimum; very uniform within its type
United Cooperative Society, Maynard				
553 F	Calendula	Double Mixed.....	Good	Satisfactory; 6 types
554 F	Cleome	Pink Queen.....	Good	Satisfactory
555 F	Didiscus	Blue Lace Flower.....	Good	Satisfactory
Winer's Hardware Co., Braintree				
1074 F	Tagetes	Yellow Supreme.....	Good	Satisfactory
W. Allee Burpee Co., Philadelphia, Pa.				
Jacques Hardware Co., Milford				
471 F	Antirrhinum	Half Dwarf Mixed.....	Fair	Satisfactory; 7 colors
416 F	Callistephus	Giant Branching Mixed.....	Good	Satisfactory
470 F	Centaurea	Jubilee Gem.....	Good	Satisfactory
419 F	Delphinium	Tall Double Mixed.....	Good	Satisfactory
417 F	Gypsophila	King of the Market.....	Good	Satisfactory
420 F	Iberis	Umbellata Mixed.....	Fair	Satisfactory; 4 colors
418 F	Impatiens	Mixed Double Flowered.....	Good	Five colors; 16% single; 2% Camellia flowered
472 F	Petunia	Hybrida Mixed.....	Good	Satisfactory; 5 colors
422 F	Portulaca	Single Mixed.....	Fair	7 colors; 2% double
468 F	Scabiosa	Tall Double Mixed.....	Good	Satisfactory; 7 colors
421 F	Tagetes	Tall African Double Mixed.....	Good	Satisfactory
469 F	Zinnia	Lilliput Mixed.....	Good	Satisfactory; 6 colors
McClellan's Store, Norwood				
491 F	Callistephus	American Beauty.....	Good	Satisfactory; 4 colors
494 F	Tagetes	Chrysanthemum & Peony Flowered	Good	Satisfactory
492 F	Zinnia	Lilliput Mixed.....	Good	Satisfactory; 7 colors
493 F	Zinnia	Gigantic.....	Good	Satisfactory; 10 colors; Excellent mixture
New Style Hardware Store, Rosindale				
517 F	Alyssum	Little Gem.....	Fair	Satisfactory
516 F	Centaurea	Blue Boy.....	Good	Satisfactory
518 F	Tropaeolum	Golden Gleam.....	Good	Satisfactory
Crosman Seed Corp., East Rochester, N.Y.				
Ben Franklin Store, Chelmsford				
1011 F	Petunia	Hybrida Mixed.....	Good	Satisfactory; 9 colors
1010 F	Zinnia	Dwarf Lilliput Mixed.....	Good	Satisfactory; 6 colors

Table 5
Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Germination	Field Tests
				Performance
Crosman Seed Corp.—(Continued)				
1012 F	Zinnia	Ben Franklin Stores, Continued Mexican Double.....	Good	Satisfactory
J. J. Kresge Co., Fitchburg				
571 F	Alyssum	Violet Queen.....	Good	4% White Alyssum
569 F	Centaurea	Ruby Red.....	Good	Satisfactory
570 F	Centaurea	Double Blue.....	Good	2% Purple
572 F	Gypsophila	White.....	Good	Satisfactory
A. J. Tepper & Co., Orange				
1008 F	Alyssum	Dwarf Pure White.....	Good	Satisfactory
1007 F	Callistephus	American Beauty-Wilt Resistant (Mixed Colors)	Good	Satisfactory; 3 colors
1009 F	Tagetes	Tall Double African.....	Good	Satisfactory; Yellow and Orange
Deerington Zinnia Gardens, Bargersville, Ind.				
544 F	Zinnia	F. W. Woolworth Co., Worcester Baby Bee.....	Good	10% off-type
H. A. Dreer, Inc., Philadelphia, Pa.				
1061 F	Alyssum	Dreer Shipping Centre, Boston Carpet of Snow, No. 1071.....	Fair	Height not uniform. Also too tall for a true Carpet of Snow
1063 F	Callistephus	Royal Scarlet, No. 1354.....	None**	
1060 F	Centaurea	Basket Flower, No. 1865.....	Good	Satisfactory
1059 F	Delphinium	Double Giant Improved Mixed- No. 2740.....	Good	Satisfactory; 5 colors
1062 F	Dianthus	Double Fireball.....	Good	Satisfactory
1058 F	Reseda	Sweet Scented, No. 3006.....	Good	Satisfactory
1064 F	Verbena	Giant Flowering Annapolis Blue ..	Fair	5% Pink flowered 5% Light Blue
Ferry-Morse Seed Co., Detroit, Mich.				
Allen Hardware Co., Needham				
403 F	Delphinium	Super Majestic Mixed.....	Good	Satisfactory; 5 colors
444 F	Impatiens	Double Mixed.....	Good	Camellia flowered 90%; only 2 colors
400 F	Tagetes	French Double Dwarf Harmony ..	Good	Satisfactory
404 F	Tropaeolum	Golden Gleam.....	Good	Satisfactory
401 F	Zinnia	Giant Double Mixed.....	Good	Satisfactory; 6 colors
Ben Franklin Store, Arlington Heights				
440 F	Calendula	Orange King.....	Good	Satisfactory
443 F	Callistephus	Giant Crego Purple.....	Good	4% Pink
434 F	Callistephus	Giant Crego Rose Pink.....	Good	3% White; 2% Purple
439 F	Eschscholtzia	Extra Golden.....	Good	Satisfactory
441 F	Lupinus	Texas Blue Bonnet.....	Poor**	Too few plants for a performance test
442 F	Mirabilis	Mixed.....	Good	Satisfactory; 6 colors
438 F	Tagetes	Burpee's Gold.....	Fair	5% Crown of Gold
435 F	Zinnia	Liliput Rosebud.....	Good	2% Deep dark Rose
Carlisle Hardware Co., Springfield				
592 F	Cosmos	Orange Flare.....	Good	Satisfactory
Coggan & Sherman, Malden				
596 F	Centaurea	Red King.....	Good	Satisfactory
595 F	Eschscholtzia	Extra Golden.....	Good	Satisfactory
597 F	Zinnia	Dream.....	Good	Satisfactory
Jordan-Marsh Co., Boston				
608 F	Alyssum	Carpet of Snow..... (Pelleted)	Poor**	Shows up poorly with other lots of same type. Late. Satisfactory
609 F	Callistephus	Giant Crego Mixed.....	Fair	Satisfactory; 3 colors
606 F	Cosmos	Sensation Mixed..... (Pelleted)	Good	Satisfactory; 4 colors
607 F	Petunia	Large Flowered Mixed.....	Good	Satisfactory; 4 colors
J. J. Newberry & Co., Leominster				
508 F	Ageratum	Blue Bedder.....	Good	95% off-type. Habit of growth is compact but taller than that stated

**Laboratory Germination: 1063—0%; 441—4%; 608—42%

Table 5
Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Germination	Field Tests
				Performance
Ferry-Morse Seed Co.—(Continued)				
507 F	Cynoglossum	Firmament	Good	Satisfactory
505 F	Delphinium	Brilliant Rose Giant	Fair	Satisfactory
510 F	Gypsophila	Covent Garden Market	Good	Satisfactory
509 F	Petunia	Celestial Rose	Good	Satisfactory
506 F	Tagetes	Treasure Chest-African Double Mixed	Good	Satisfactory
J. J. Newberry & Co., Woburn				
558 F	Alyssum	Violet Queen	Good	Satisfactory
559 F	Centaurea	Jubilee Gem	Good	Satisfactory
560 F	Cosmos	Yellow Flare	Good	Satisfactory
Norwood Hardware Co., Norwood				
486 F	Alyssum	Little Gem	Good	Satisfactory
489 F	Centaurea	Blue Boy	Good	Satisfactory
487 F	Cosmos	Sensation Mixed	Good	Satisfactory; 3 colors
485 F	Zinnia	Canary Bird Light Yellow	Good	Satisfactory
488 F	Zinnia	Crimson Monarch-Giant-Double Dahlia Flowered	Good	Satisfactory
Thomas J. Grey Co., Abington, Mass.				
792 F	Ageratum	Blue Ball Improved	Good	Satisfactory
790 F	Calendula	Ball Orange	Good	Satisfactory
793 F	Callistephus	Heart of France	Good	Satisfactory
789 F	Cosmos	Sensation Mixed	Good	Satisfactory
794 F	Helichrysum	Mixed	Good	Satisfactory; 5 Colors
795 F	Iberis	White Perfection	Good	Satisfactory
791 F	Petunia	Firechief	Good	Satisfactory
Joseph Harris Co., Rochester, N. Y.				
Joseph Harris Co., Lexington				
621 F	Alyssum	Little Gem	Good	Satisfactory
622 F	Callistephus	American Branching Crimson	Good	Satisfactory; 3% Purple
623 F	Petunia	Gypsy	Good	Satisfactory
Chas. C. Hart Seed Co., Wethersfield, Conn.				
Bryan Hardware Co., Westfield				
583 F	Cosmos	Radiance	Good	Satisfactory
582 F	Impatiens	Choice Double Mixed	Good	15% Single; 7 colors
Federal Supply Co., Northampton				
581 F	Alyssum	Little Gem	Fair	85% Carpet of Snow
579 F	Petunia	Balcony Blue	Poor**	Satisfactory
580 F	Scabiosa	Mourning Bride Mixed	Poor**	Satisfactory; 3 colors
Fletcher Hardware Co., Watertown..				
598 F	Petunia	Hybrida Finest Mixed	Good	Satisfactory; 9 colors
599 F	Tagetes	Crown of Gold, Collorette	Good	Satisfactory
Franklin Hardware Co., Springfield				
589 F	Eschscholtzia	California Poppy Mixed	Good	Satisfactory; 3 colors; poor mixture
590 F	Zinnia	California Giants Red	Good	8% off-type; no taller than Dahlia flowered
K. Service, Melrose				
593 F	Kochia	Mexican Fire Bush	None**	
594 F	Zinnia	Orange Fantasy	Good	4% Red Fantasy
Lockhart Hardware Co., Natick				
407 F	Centaurea	Double Mixed	Fair	Satisfactory; 6 colors
408 F	Dianthus	Finest Mixed	Good	Satisfactory; 8 colors
410 F	Helichrysum	Mixed	None**	
409 F	Tagetes	Crown of Gold, Collorette	Good	Satisfactory
406 F	Zinnia	Lilliput Purple	Good	6% Rose Color
405 F	Zinnia	Lilliput Red	Good	Satisfactory
Sabourin Hardware Co., Fitchburg				
573 F	Calendula	Orange King	Good	2% Lemon Queen
574 F	Celosia	Plumosa Tall Mixed	Good	18% Crested type
575 F	Verbena	Hybrida Best Mixed	Poor**	Satisfactory

**Laboratory Germination: 579—10%; 580—7%; 593—0%; 410—0%; 575—18%.

Table 5
Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Germination	Field Tests	
					Performance
Chas. C. Hart Seed Co.—(Continued)					
Town Paint & Supply Co., Arlington					
523 F	Ageratum	Blue Perfection.....	Good	Satisfactory	
524 F	Alyssum	Purple Violet Queen.....	Good	2% White Alyssum	
522 F	Centaurea	Double Blue.....	Good	6% Pinkie; 2% Purple	
525 F	Kochia	Mexican Fire Bush.....	Fair	Satisfactory	
526 F	Tropaeolum	Golden Gleam.....	Poor**	Too few plants for a performance test	
521 F	Zinnia	Dahlia Flowered Mixed.....	Good	Satisfactory; 7 colors	
Waverly Hardware & Supply Co., Lexington					
552 F	Tagetes	African Tall Double Elderado.....	Good	Satisfactory	
551 F	Tropaeolum	Dwarf Mixed.....	Good	Satisfactory; 4 colors	
550 F	Zinnia	Finest Mixture.....	Good	Satisfactory; 7 colors	
Winer's Hardware Co., Braintree					
1073 F	Callistephus	Giant Comet Mixed.....	Good	Satisfactory; 4 colors	
Budd D. Hawkins, Reading, Vt.					
I. B. Barrows & Co., Worcester					
117 F	Callistephus	New Plume or Comet.....	Poor**	Satisfactory	
118 F	Petunia	Rosy Morn.....	Fair	12% off-type	
119 F	Scabiosa	Mourning Bride Double Mixed.....	Poor*	Too few plants for a performance test	
116 F	Zinnia	Fantasy Mixed.....	Poor**	Not Fantasy; Burpee type large flowered crinkly leaves	
Mandeville & King Co., Rochester, N.Y.					
Allen Hardware Co., Nedham					
455 F	Ageratum	Lavender Blue Floss Flower.....	Good	Satisfactory	
413 F	Callendula	Orange King.....	Good	Satisfactory	
415 F	Centaurea	Pinkie.....	Good	Satisfactory	
453 F	Cosmos	Radianc Two Tone.....	Good	Satisfactory	
451 F	Dimorphotheca	African—All Colors.....	Good	Satisfactory; 5 colors	
412 F	Eschscholtzia	All Colors.....	Good	Satisfactory; 7 colors	
454 F	Iberis	White Giant Hyacinth Flowered..	Good	Satisfactory	
477 F	Kochia	Summer Cypress Burning Bush...	Good	Satisfactory	
452 F	Petunia	Violacea.....	Good	Satisfactory	
411 F	Phlox	Dwarf—All Colors.....	Good	Satisfactory; 9 colors	
474 F	Tagetes	Burpee Gold—Odorless.....	Fair	Satisfactory	
475 F	Tagetes	Crown of Gold, Odorless.....	Good	5% Dwarf Harmony	
414 F	Zinnia	Fantasy—All Colors.....	Good	6% not Fantasy type; 6 colors	
Bradford Hardware Co., Hyannis					
1022 F	Petunia	Flaming Velvet.....	Good	Satisfactory	
1024 F	Vinca	Periwinkle.....	Good	Satisfactory	
1020 F	Zinnia	Lilliput Red Riding Hood.....	Good	Satisfactory....	
J. H. Chandler & Co., Newton Center					
532 F	Anchusa	Blue Bird.....	Good	Satisfactory	
531 F	Aster	Tahoka Daisy.....	Poor*	Satisfactory	
530 F	Centaurea	Red Boy.....	Good	6% Pinkie	
527 F	Scabiosa	Mourning Bride, Rosette.....	Fair	5% off-type; Yellowish	
529 F	Tagetes	Sunny Dwarf Single.....	Good	Satisfactory	
528 F	Zinnia	Lilliput—Black Ruby.....	Good	9% Lavender	
Davis Hardware Co., Gardner					
1002 F	Alyssum	Snow Cloth.....	Good	Satisfactory	
1003 F	Zinnia	Golden Yellow Creeping.....	Good	Satisfactory	
Flynn's Hardware Co., Attleboro					
501 F	Ageratum	Lavender Blue Floss Flower.....	Good	Satisfactory	
496 F	Calendula	Orange Shaggy.....	Good	4% Yellow	
502 F	Salvia	Bonfire.....	Poor*	Satisfactory	
500 F	Tagetes	Mammoth Mum—Lemon Yellow..	Good	Satisfactory	
497 F	Tithonia	Torch.....	Good	Satisfactory	
503 F	Zinnia	California Giant Red.....	Good	Satisfactory	
504 F	Zinnia	Rosebud Rose Pink.....	Fair	Satisfactory	
495 F	Zinnia	Will Rogers.....	Good	Satisfactory	
Hyannis Hardware Co., Hyannis					
1021 F	Impatiens	Camellia Flowered.....	Good	Not Camellia flowered; 6 colors	

*Insufficient seeds for laboratory test.

**Laboratory germination: 117—13%; 116—40%; 526—30%.

Table 5
Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Mandeville King Co.—(Continued)				
1023 F	Petunia	General Dodds.....	Good	Only 50% Blood Red color
Parker Hardware Co., Maynard				
557 F	Cynoglossum	Firmament.....	Good	Satisfactory
556 F	Zinnia	Little Red Riding Hood.....	Good	Satisfactory
Northrup, King & Co. Minneapolis Minn.				
Central Hardware Co., Fitchburgh				
568 F	Alyssum	Sweet.....	Good	Satisfactory
567 F	Calendula	Double Lemon Queen.....	Good	Satisfactory
565 F	Callistephus	Crego Wilt Resistant Blue.....	Good	4% Purple-5% Pink
566 F	Lupinus	Blue Bonnet.....	Poor**	Too few plants for a performance test
F. W. Woolworth Co., Attleboro				
483 F	Ageratum	Blue Perfection.....	Fair	Satisfactory
482 F	Alyssum	Little Gem.....	Good	Little Gem 65%; Carpet of Snow 20%; Sweet White 15%
F. W. Woolworth Co., Framingham				
484 F	Anchusa	Blue Bird.....	Fair	Satisfactory
481 F	Cleome	Giant Pink Queen.....	Fair	Satisfactory
480 F	Didiscus	Blue Lace Flower.....	Good	Satisfactory
467 F	Celosia	Plumed or Feathered.....	Good	4% crested
466 F	Celosia	Tall Red Shades.....	Good	6% Yellow
450 F	Centaurea	Double Pink.....	Good	4% Ruby Red
465 F	Cosmos	Yellow Flare.....	Good	Satisfactory
449 F	Heliphinium	Stock Flowered Mixed.....	Good	4% single flowered; 6 colors
464 F	Dianthus	Double Mixed Colors.....	Good	6% single; 8 colors
1075 F	Helichrysum	Everlasting.....	Poor**	Too few plants for a performance test
447 F	Verbena	Mammoth Flowered Scarlet Lucifer	Fair	Satisfactory
F. W. Woolworth Co., Worcester				
536 F	Callistephus	Crego Wilt Resistant Purple.....	Poor**	Satisfactory
538 F	Cosmos	Sensation Giant Dazzler.....	Good	Satisfactory
546 F	Gaillardia	Pieta Indian Chief.....	Good	Satisfactory
548 F	Nicotiana	Crimson Bedder.....	Good	2% White
547 F	Papaver	American Legion Shirley.....	Good	20% Off-type
535 F	Petunia	Violet Blue.....	Good	Satisfactory
537 F	Reseda	Sweet Scented.....	Good	Satisfactory
549 F	Zinnia	California Giant Double-White Purity.....	Fair	Satisfactory
The Page Seed Co., Greene, N. Y.				
Eensgton Hardware Co., Gardner				
1001 F	Tropaeolum	Dwarf Mixed.....	Good	Satisfactory; 4 colors
J. H. Fairbanks Co., Bridgewater				
511 F	Tropaeolum	Dwarf Mixed.....	Good	Satisfactory; 4 colors
Manny's Hardware Co., Taunton				
1167 F	Ageratum	4-6 inches tall.....	Good	Habit not too compact
1165 F	Portulaca	Dwarf Double Mixed.....	Good	10% single; 7 colors
1166 F	Portulaca	Finest Single Mixed.....	Good	4% double; 9 colors
Pelletized Seed Co., Wayne, Pa.				
Joseph Breck & Sons, Boston				
346 F	Callistephus	Late Branching Mixed..... (Pelleted)	Fair	Satisfactory; 4 colors
339 F	Cosmos	Sensation Radiance..... (Pelleted)	Good	Satisfactory
Perry Seed Co., Boston, Mass.				
641 F	Alyssum	Violet Queen.....	Good	Satisfactory
644 F	Anchusa	Blue Bird.....	Good	Satisfactory
647 F	Cleome	Helen Campbell White.....	Good	6% Pink Cleome
643 F	Nicotiana	Daylight Sensation.....	Good	Satisfactory; 6 colors
650 F	Petunia	Admiral.....	Good	Satisfactory
649 F	Scabiosa	Grandiflora Oxford Blue.....	Fair	3% Rose; 3% White
646 F	Tagetes	Dwarf Single French.....	Good	Satisfactory
642 F	Tagetes	Mission Giant Mixed.....	Good	Satisfactory

**Laboratory germination: 566—1%; 1075—12%; 536—23%.

Table 5
Flower Seed Inspection—Continued

Lab No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
645 F	Zinnia	Perry Seed Co.—(Continued)		
648 F	Zinnia	Dahlia Flowered Golden Century	Good	Satisfactory
		Red Riding Hood	Good	Satisfactory
		Rice Branch, Associated Seed Growers, Cambridge, N. Y.		
		The Clapper Co., West Newton		
946 F	Petunia	Giants of California	Fair	Satisfactory
945 F	Phlox	Choice Mixed	Fair	Satisfactory; 10 colors
944 F	Salvia	Bonfire	Fair	Satisfactory
943 F	Zinnia	Polar Bear	Good	Satisfactory
		Colonial Hardware Co., Stoughton		
512 F	Callistephus	Giant Bright Blue	Good	Satisfactory
513 F	Centaurea	Double Blue	Fair	Satisfactory
		Fells Hardware Co., Medford		
561 F	Zinnia	Dahlia Flowered Mixed	Good	Satisfactory; 7 colors
		Harding Street Grain Co., Worcester		
679 F	Petunia	Hybrida Mixed (Pelleted)	Fair	Satisfactory; 8 colors
680 F	Zinnia	Dahlia Flowered Mixed	Good	Satisfactory; 6 colors
		Huntley Paints & Hardware, Lowell		
1013 F	Reseda	Sweet Machet	Good	Satisfactory
		Marlboro Hardware Co., Marlboro		
479 F	Callistephus	Ostrich Plume Mixed	Good	Satisfactory; 3 colors
478 F	Zinnia	Lilliput	Good	Satisfactory; 7 colors
		McClellan's Store, Westfield		
588 F	Phlox	Annual Cream	Fair	Satisfactory
586 F	Salvia	Bonfire	Fair	Satisfactory
585 F	Tagetes	Melody	Good	Satisfactory
587 F	Zinnia	Little Red Riding Hood	Good	Satisfactory
		Norwood Hardware Co., Norwood		
490 F	Ageratum	Blue Perfection	Good	Satisfactory
		C. M. Packard & Co., Wareham		
1015 F	Petunia	Radiance	Good	4% Rosy Morn; 2% Violet Red Color
1014 F	Portulaca	Single Mixed	Fair	4% double; 6 colors
		Western Auto Stores, Worcester		
543 F	Calendula	Double Mixed	Good	Satisfactory; 4 types
539 F	Callistephus	Ostrich Plumed Mixed	Good	Satisfactory; 3 colors
542 F	Gypsophila	Covent Garden Market	Good	Satisfactory
540 F	Tagetes	Harmony	Fair	Satisfactory
541 F	Zinnia	Cherry Queen Super Giant	Good	6% off-type
		J. B. Rice, Jr., Inc., Shushan, N. Y.		
		Crown Paint & Paper Co., North Adams		
1089 F	Callistephus	Heart of France	Good	Satisfactory
1090 F	Iberis	Annual Mixed	Fair	Satisfactory; 5 colors
1091 F	Petunia	Rosy Morn	Good	Satisfactory
1088 F	Phlox	Drummond Mixed	Good	Satisfactory; 9 colors
1092 F	Portulaca	Single Mixed	Good	Satisfactory; 8 colors
		Ross Bros. Co., Worcester, Mass.		
		Hyannis Seed Co., Hyannis		
1018 F	Alyssum	Sweet	Good	Satisfactory
1019 F	Tropaeolum	Double Gleam Hybrids	Fair	Satisfactory
		Ross Bros. Co., Worcester		
211 F	Ageratum	Blue Perfection	Good	Satisfactory
220 F	Alyssum	Carpet of Snow	Good	Satisfactory
212 F	Calendula	Chrysantha or Sunshine	Good	Satisfactory
213 F	Centaurea	Double Blue Boy	Good	Satisfactory
217 F	Petunia	Silver Blue	Good	15% off-type; mixture of 7 colors
218 F	Portulaca	Single Jewel	Good	Satisfactory
216 F	Tagetes	Yellow Supreme	Good	Satisfactory

Table 5
Flower Seed Inspection—Continued

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer when other than Wholesale Distributor, Place Collected, and Variety of Seed	Field Tests	
			Germination	Performance
Ross Bros. Co.—(Continued)				
219 F	Zinnia	California Giants or Mammoth Violet Queen.....	Good	2% off-type
Sears, Roebuck & Co., Chicago, Ill., Sears, Roebuck & Co., Framingham				
457 F	Ageratum	Blue Perfection.....	Good	Satisfactory
461 F	Alyssum	Sweet White.....	Good	Satisfactory
423 F	Antirrhinum	Rust Resistant Mixed.....	Good	Satisfactory; 6 colors
456 F	Centaurea	Double Mixed.....	Good	Satisfactory; 5 colors
460 F	Delphinium	Pink.....	Fair	Satisfactory
426 F	Dimorphotheca	African Daisy Mixed.....	Good	Satisfactory; 4 colors
463 F	Lobelia	Dwarf Blue.....	Good	Satisfactory
425 F	Petunia	Single Mixed Colors.....	Good	Satisfactory; 7 colors
458 F	Petunia	Rose of Heaven.....	Good	Satisfactory; 7 colors
424 F	Scabiosa	Mourning Bride Mixed.....	Fair	Satisfactory; 5 colors
Sterling Seed Co., Minneapolis, Minn. H. L. Greene Co., Taunton				
430 F	Ageratum	Double Blue Perfection.....	Good	Satisfactory
431 F	Alyssum	Violet Queen.....	Good	Not a true Violet Queen—a very faded Violet color
429 F	Callistephus	Crego Wilt Resistant Red.....	Good	Satisfactory
433 F	Centaurea	Jubilee Gem.....	Good	Satisfactory
428 F	Cosmos	Sensation Giant Dazzler.....	Good	Satisfactory
432 F	Tagetes	Guinea Gold.....	Good	Satisfactory
Vaughan's Seed Store, New York, N. Y. C. H. Symmes & Co., Winchester				
1026 F	Alyssum	Little Gem.....	Good	35% Carpet of Snow
1025 F	Callistephus	Giant Branching Mixed.....	Poor**	Too few plants for a performance test
1028 F	Cosmos	Early Sensation Pink & White....	Good	Satisfactory
1029 F	Scabiosa	Blue Moon.....	Fair	Satisfactory
1027 F	Tagetes	Sunset Giants.....	Good	Satisfactory
S. D. Woodruff & Sons, Orange, Conn. Bibeau's Hardware Co., Gardner				
1004 F	Cosmos	Orange Flare.....	Fair	Satisfactory
Croteau's Hardware Co., Northampton				
578 F	Centaurea	Mixed Double.....	Fair	Satisfactory; 3 colors
576 F	Petunia	Rosy Morn.....	Good	Satisfactory
577 F	Zinnia	Super Crown of Gold—Pastel Shades	Good	Satisfactory
Harmony Supply Co., Medford				
562 F	Ageratum	Blue Perfection.....	Good	Satisfactory
563 F	Delphinium	Annual Mixed.....	Poor**	Satisfactory
Harvey Hardware Co., Falmouth				
1016 F	Celosia	Crested Dwarf Mixed.....	Good	Satisfactory
New Style Hardware Co., Roslindale				
520 F	Centaurea	Double Blue.....	Poor**	Satisfactory
584 F	Cosmos	Orange Flare	Good	Satisfactory
Oliver's Hardware Co., Stoughton				
515 F	Petunia	White King.....	Good	6% Pink Flowered
514 F	Salvia	Bonfire.....	Poor**	Satisfactory
Town Hardware Co., Orange				
1006 F	Calliopsis	Dwarf Mixed.....	Good	60% not dwarf
1005 F	Petunia	General Dodds.....	Good	8% Light Rose

**Laboratory Germination: 1025—4%, 563—40%; 520—40%; 514—30%.

Summary of Inspection

The following table is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Table 6

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Associated Seed Growers, Inc. New Haven, Conn.	14	14	1						
Aubuchon, W. E. & Co. Fitchburg, Mass.	1	1	0						
Boston Market Gardner's Assoc. Boston, Mass.	3	3	0						
Breck, Joseph, & Sons. Boston, Mass.	27	27	0				1	1	0
Burpee, W. Atlee, Co. Philadelphia, Pa.	48	48	0				1	1	0
The Clapper Co. West Newton							1	0	1
Comstock, Ferre & Co. Wethersfield, Conn.	43	43	0	3	3	0			
Cone, Arthur K. Inc. Buffalo, N. Y.	30	30	0	78	75	3	3	2	1
Craver Dickinson Seed Co. Buffalo, N. Y.				5	4	1			
Crosman Seed Corp. Rochester, N. Y.	10	10	0						
Cox, Charles M., Co. Boston, Mass.				2	2	0			
Dickinson, Albert, Co. Chicago, Ill.				9	9	0			
Doughten Seed Co. Jersey City, N. J.				2	1	1	3	1	2
Dreer, Henry A., Inc. Philadelphia, Pa.	6	5	1						
Eastern States Farmers' Exchange West Springfield, Mass.	29	29	0	16	16	0	1	1	0
Empire Seed Co. Fredonia, N. Y.	5	5	0						
Essex County Co-operative Farming Assoc., Topsfield, Mass.				1	1	0			
Ferry Morse Seed Co. Detroit, Mich.	27	27	0						
Flewelling, Lee, Grower Crouseville, Me.				1	1	0			
Fredonia Seed Co. Fredonia, N. Y.	18	18	0				1	1	0
Garfield, Williamson, Co. Jersey City, N. J.							1	1	0
Goldenblum, William, Co. New York, N. Y.				1	1	0	1	1	0
Grey, Thomas J., Co. Abington, Mass.	13	12	1						
Harris, Joseph, Co. Rochester, N. Y.	20	20	0						
Hart, Charles C., Seed Co. Wethersfield, Conn.	57	57	0	1	1	0			
Hawkins, Budd D. Reading, Vt.	18	14	4						
Knoxville Seed Co. Knoxville, Tenn.							1	1	0
Landreth D. Seed Co. Philadelphia, Pa.	14	13	1				3	2	1
Larowe Mills, Inc. Cohocton, N. Y.				1	1	0			
Lee Patten Co. Jersey City, N. J.				1	1	0	3	3	0
Lyon, John D., Inc. Cambridge, Mass.							3	0	3
Mandeville & King Co. Rochester, N. Y.	11	11	0						

Table 6
Summary of Inspection—Concluded

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
McCullough, Charles J., Seed Co. Cincinnati, Ohio							1	0	1
Michael-Leonard Seed Co. Chicago, Ill.	12	12	0	2	2	0			
Northrup, King & Co. Minneapolis, Minn.	16	16	0	3	3	0			
O & M Seed Co. Green Springs, Ohio				5	5	0			
Ostberg Seed Co. Chicago, Ill.							2	2	0
The Page Seed Co. Greene, N. Y.	29	28	1	8	8	0	2	1	1
Pelletized Seed Co. Wynnewood, Pa.	8	8	0						
Perry Seed Co. Boston, Mass.	16	16	0				1	0	1
Philadelphia Seed Co. Philadelphia, Pa.							1	1	0
Rice, Jerome B. Seed Co. Cambridge, N. Y.	21	21	0						
Rice, J. B. Jr., Inc. Sushan, N. Y.	9	9	0				1	0	1
Robinson, Lawrence, & Sons. Modesto, Cal.	3	3	0						
Ross Bros. Co. Worcester, Mass.	15	15	0	10	10	0			
Sears, Roebuck & Co. Chicago, Ill.	6	6	0						
Scarlett, Wm. G., & Co. Baltimore, Md.				37	25	12	3	1	2
Sordillo, Joseph, & Sons. Boston, Mass.	12	9	3						
Stanford Seed Co. Buffalo, N. Y.				24	21	3	4	2	2
Sterling Seed Co. Minneapolis, Minn.	11	11	0						
Vaughan's Seed Store New York, N. Y.	14	13	1				1	0	1
Whitney Seed Co. Buffalo, N. Y.				33	33	0	4	3	1
Woodruff, F. H., & Sons. Milford, Conn.	100	99	1	2	2	0	3	3	0
Woodruff, S. D., & Sons. Orange, Conn.	32	31	1	6	6	0	1	1	0
Worcester Grain & Coal Co. Worcester, Mass.	6	4	2						
Totals	704	688	16	251	231	20	47	29	18

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 152

JULY 1952

**Thirty-second Annual Report of
Pullorum Disease Eradication
in Massachusetts**

BY THE POULTRY DISEASE CONTROL LABORATORY

A total of 510 chicken, turkey, and pheasant flocks was tested during the 1951-52 testing season. A total of 1,406,481 samples was tested, of which 0.015 per cent were positive. Eight flocks that were negative the previous season revealed reactors this past season. At the close of the testing year only five flocks were classified as infected. It is encouraging to note that 96.37 per cent of all chickens tested were in 100 per cent tested nonreacting flocks.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.



THIRTY-SECOND ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1951-1952

By the Poultry Disease Control Laboratory¹

INTRODUCTION

Testing results for the 1951-52 season reveal that Massachusetts poultrymen have been successful in further elimination of pullorum infection from their flocks. Only 225 reactors were detected among 1,370,430 samples tested. The average percentage of reactors is the lowest on record for Massachusetts. At the close of the season, only five flocks were classified as positive. It is also encouraging to note that 96.37 per cent of the total birds tested were in 100 per cent tested nonreacting flocks.

During the past year testing operations proceeded with few difficulties, and the majority of flock owners received service when they requested it. The cooperation of the flock owners was appreciated and enabled the laboratory staff to render high quality service to the industry.

Appreciation is also expressed for the cooperation and assistance received in this program from the Extension Service, the Massachusetts Department of Agriculture, and other agencies.

SUMMARY OF SERVICE RENDERED

Flocks tested.....	510
Chicken flocks.....	417
Turkey flocks.....	72
Pheasant flocks.....	21
Number of tests.....	1,406,481
Chickens:	
Routine.....	1,361,452
Experimental.....	8,978
Fowl other than chickens:	
Routine.....	36,039
Experimental.....	12
Owners receiving necropsy service.....	35
Necropsies of reacting birds.....	81

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor in charge; G. H. Snoeyenbos, G. P. Faddoul, J. E. Gray, Research Professors; O. S. Flint (resigned), Miriam K. Clarke, O. M. Olesiuk, J. E. Gray, Assistant Research Professors; G.W. Fellows, H. A. Peck, R. L. Bennett, C. D. Brandt (resigned), and B. A. Bachman (resigned), Research Assistants. Appreciation is extended to Dr. K. L. Bullis, Head of the Department, for assistance in the testing work.

Table 1. Distribution of Tests and Reactors by Counties and by Breeds

Breeds	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Per Cent Positive
Rhode Island Reds														
Total tests.....	10,184	2,529	60,329	196	28,046	15,046	16,243	6,073	49,747	70,647	22,662	83,122	364,824	0.04
Positive tests.....	0	0	0	0	0	0	140	0	1	0	0	1	142	
New Hampshires														
Total tests.....	21,379	2,195	25,084	.....	89,908	4,603	3,730	17,166	88,557	33,250	82,241	38,261	406,374	0.001
Positive tests.....	0	0	0	.....	0	0	0	0	4	0	0	0	4	
Barred Plymouth Rocks														
Total tests.....	1,631	7,102	40,978	5,008	7,500	16,288	1,188	3,952	71,659	26,038	48,416	41,559	271,319	0.001
Positive tests.....	0	0	0	0	0	0	0	0	1	0	0	2	3	
White Plymouth Rocks														
Total tests.....	460	9,668	21,654	.....	11,735	13,419	2,122	25,851	66,507	19,626	30,739	32,370	234,151	0.03
Positive tests.....	0	0	0	.....	0	3	6	0	0	1	0	63	73	
White Leghorns														
Total tests.....	.....	12,688	1,062	.....	6,893	519	317	1,311	65	9,471	52	2,324	34,702	0.00
Positive tests.....	.....	0	0	.....	0	0	0	0	0	0	0	0	0	
Miscellaneous														
Total tests.....	541	1,259	11,398	.....	13,009	721	47	1,135	7,881	14,582	5,020	3,767	59,060	0.005
Positive tests.....	0	0	0	.....	0	1	0	0	0	2	0	0	3	
Total Tests.....	34,195	35,441	160,505	5,204	157,091	50,596	23,647	55,488	284,116	173,614	189,130	201,403	1,370,430	
Positive test														
Number.....	0	0	0	0	0	4	146	0	6	3	0	66	225	
Per Cent.....	0.00	0.00	0.00	0.00	0.00	0.008	0.62	0.00	0.002	0.002	0.00	0.03	0.016	

DISTRIBUTION OF TESTS AND REACTORS

Table 1 reveals that 1,370,430 samples were received from chicken flocks in 12 counties. The percentage of positive tests was 0.016, the lowest on record. Middlesex, Worcester, and Plymouth lead in the number of samples tested. It is encouraging to note that no reactors were detected in Barnstable, Berkshire, Bristol, Dukes, Essex, Hampshire, and Plymouth Counties. In the remaining five counties, with the exception of two, the number of reactors was six or less. These results indicate that pullorum disease is gradually being eliminated.

The following breeds were tested: Bantam, Barred Plymouth Rock, Brahma, Columbian, Cornish, Crosses, Delaware, Eisenbar, Jersey White Giant, New Hampshire, Rhode Island Red, White American, White Leghorn, White Plymouth Rock, Wyandottes (Silver Laced, White).

During the past year the White Plymouth Rock breed has become very prominent in Massachusetts. At the present time the Rhode Island Red, New Hampshire, Barred Plymouth Rock, and White Plymouth Rock are the predominating breeds. Of the total samples, 26.62 per cent were taken from Rhode Island Red, 29.65 per cent from New Hampshire, 19.80 per cent from Barred Plymouth Rock, 17.09 per cent from White Plymouth Rock, and the remainder from other breeds tested. Of the 1,244,223 samples collected from females, 45,118 were from hens and 1,199,105 from pullets, with 0.00 and 0.017 per cent reactors, respectively. The 126,207 samples collected from the males gave 0.011 per cent positive tests.

ANNUAL TESTING OF FLOCKS

Table 2 lists the results from flocks tested (1) for the first time, (2) intermittently, (3) for two consecutive years, and (4) for three or more consecutive years.

It is of interest to note that the flocks tested in the first three groups revealed no reactors. These three groups included 94 flocks, representing 187,967 birds. All but 10 flocks in these groups were 100 per cent tested. The average number of birds per flock for the respective groups is as follows: first year, 1,685; intermittent, 1,566; and two consecutive years, 2,545.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Per Cent	100 Per Cent Tested	Partially Tested	100 Per Cent Tested	Partially Tested
Tested for the first time.....	38	64,042	64,042	0	0.00	34	4	-	-
Intermittent testing.....	19	29,758	29,758	0	0.00	17	2	-	-
Two consecutive years.....	37	94,167	94,776	0	0.00	33	4	-	-
Three or more consecutive years..	323	1,155,988	1,181,854	225	0.016	311	7	5	-
TOTALS.....	417	1,343,955	1,370,430	225	0.016	395	17	5	-

In the group tested for three or more consecutive years there were 323 flocks, representing 1,181,854 tests, of which 0.019 were positive. A total of 318 non-reacting flocks was detected, which included 98.29 per cent of the birds tested in this group. Five flocks were classified as positive. The average number of birds per flock was 3,579.

For the four groups as a whole, 417 flocks were tested, representing 1,343,955 birds and 1,370,430 samples, of which 0.016 per cent were positive. The 395 flocks that were 100 percent tested and nonreacting contained 1,295,129 birds or 96.37 per cent of the total birds tested,

During the past year, 88 or 19.64 per cent of the flocks tested in 1950-51, were not tested. Records reveal that only a small percentage of the flock owners resort to an intermittent testing program. The majority of flock owners who discontinue testing do so permanently. However, this does not alter the fact that annual testing is essential in the control and eradication of the disease. An effective program for maintaining pullorum-clean flocks includes annual testing.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

During the past year, pullorum "breaks" were observed in eight flocks, two more than in the previous season. The "breaks" this past year were considered more serious in that a number of flock owners were forced to discontinue their hatching egg production. In five instances the source of infection was unknown; and in the remaining three flocks, introduction of infected stock and returning birds from shows were regarded as the reason for the "breaks."

Table 3 gives information regarding "breaks" observed during the past 13 years. The percentage of "breaks" has increased slightly over the previous season. Although the number may be considered small, it should be realized that "breaks" on the whole constitute a serious loss to the flock owner. Furthermore, each "break" may serve as an additional focus of infection for disseminating the disease to other flocks. Flock owners are urged, therefore, to maintain strictest vigilance against the introduction of the disease.

The following measures have been found to be effective in establishing and maintaining a pullorum-free flock:

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the reports.
4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.
5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. An empty pen to each house should be provided to facilitate cleaning and disinfection during the winter months. Disinfectants approved by the United States Department of Agriculture should be used.

Table 3. The Incidence of "Breaks" Observed during the Past Thirteen Years

Year	Number of Flocks	Breaks		Flocks with Less Than 0.5 Per Cent Infection on First Test	
		Number	Per Cent	Number	Per Cent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	50.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94
1948	425	16	3.76	13	81.25
1949	386	6	1.55	3	50.00
1950	383	18	4.70	16	88.88
1951	381	6	1.57	6	100.00
1952	417	8	1.92	5	62.50

6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum-disease-free flocks. The Massachusetts Department of Agriculture, 41 Tremont Street, Boston, should be consulted regarding additions or replacements in the flock.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals such as crows, sparrows, and skunks that may carry or spread the infection.

10. Poultrymen should not custom-hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum-disease-free flocks should not permit hatching where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING FOWL OTHER THAN CHICKENS

During the past year, 36,051 samples from fowl other than chickens including 27,159 turkeys, 7,214 pheasants, 1,215 quail, 409 geese, 41 ducks, 9 guinea fowl, and 4 chukar partridge were tested. No reactors were detected. Among the 72 turkey flocks tested, 18 had more than 500 birds per flock.

NONREACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

In Table 4, nonreacting and positive flocks are listed by counties. A total of 412 nonreacting flocks, representing 1,324,195 birds, was identified in 12 counties. A total of 395 flocks, representing 1,295,129 birds, was 100 per cent tested, whereas 17 flocks that contained 29,066 birds were partially tested.

At the close of the season, only five flocks, representing 19,760 birds, were classified as positive.

These results reveal that only a small number of the total flocks tested are positive and that the Massachusetts poultrymen have been very successful in reducing pullorum infection to a very low minimum. It is hoped that in the near future all tested flocks may be classified in the nonreacting group. It is interesting to note that Barnstable, Dukes, and Plymouth Counties had only 100 per cent tested, nonreacting flocks. The positive flocks were classified in Franklin, Hampden, Norfolk, and Worcester Counties.

Table 4. Nonreacting and Positive Flocks Classified by Counties

County	100 Per Cent Tested		Partially Tested		Totals	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable.....	5	34,195	—	—	5	34,195
Berkshire.....	8	34,673	1	768	9	35,441
Bristol.....	56	151,964	5	8,541	61	160,505
Dukes.....	1	5,204	—	—	1	5,204
Essex.....	44	148,893	5	8,198	49	157,091
Franklin.....	23	50,524	—	—	23	50,524
Hampden.....	17	21,138	—	—	17	21,138
Hampshire.....	20	54,595	1	893	21	55,488
Middlesex.....	66	266,181	3	7,330	69	273,511
Norfolk.....	36	145,198	1	1,508	37	146,706
Plymouth.....	59	189,130	—	—	59	189,130
Worcester.....	60	193,434	1	1,828	61	195,262
TOTALS...	395	1,295,129	17	29,066	412	1,324,195
Positive Flocks						
Franklin.....	1	66	—	—	1	66
Hampden.....	1	1,669	—	—	1	1,669
Norfolk.....	1	13,137	—	—	1	13,137
Worcester.....	2	4,888	—	—	2	4,888
TOTALS...	5	19,760	—	—	5	19,760

COMPARISON OF 1950-51 AND 1951-52 TESTING

In Table 5 are listed the testing data for the past two seasons. Fewer flocks, birds, and samples were tested in the 1951-52 than in the 1950-51 season. Five counties had more birds this past season than in 1950-51. No reactors were detected in seven counties. The number of nonreacting flocks was less than in the previous season.

Although the number of tested flocks and birds was less than in the previous season, the over-all results reveal that progress is being made in controlling and eradicating the infection. However, it is hoped that pullorum infection will be eliminated eventually.

Table 5. Comparison of 1950-51 and 1951-52 Testing

County	Flocks	Birds	Tests	Positive Tests Per Cent	Non-reacting Flocks
1950-51 Season					
Barnstable.....	6	35,143	35,143	0.00	6
Berkshire.....	10	48,498	48,498	0.01	9
Bristol.....	60	159,312	162,526	0.00	60
Dukes.....	1	4,412	4,412	0.00	1
Essex.....	50	157,351	157,815	0.00	50
Franklin.....	27	48,007	49,931	0.02	25
Hampden.....	21	27,113	27,113	0.00	21
Hampshire.....	28	59,616	67,512	0.007	27
Middlesex.....	68	241,941	243,191	0.07	67
Norfolk.....	47	169,854	171,319	0.00	47
Plymouth.....	67	213,485	232,890	0.003	67
Suffolk.....	1	540	540	0.00	1
Worcester.....	62	193,258	193,302	0.30	61
TOTALS.....	448	1,358,540	1,394,192	0.05	442
1951-52 Season					
Barnstable.....	5	34,195	34,195	0.00	5
Berkshire.....	9	35,441	35,441	0.00	9
Bristol.....	61	160,505	160,505	0.00	61
Dukes.....	1	5,204	5,204	0.00	1
Essex.....	49	157,091	157,091	0.00	49
Franklin.....	24	50,590	50,596	0.008	23
Hampden.....	18	22,807	23,647	0.62	17
Hampshire.....	21	55,488	55,488	0.00	21
Middlesex.....	69	273,511	284,116	0.002	69
Norfolk.....	38	159,843	173,614	0.002	37
Plymouth.....	59	189,130	189,130	0.00	59
Worcester.....	63	200,150	201,403	0.03	61
TOTALS.....	417	1,343,955	1,370,430	0.016	412

THIRTY-TWO YEAR TESTING SUMMARY

Table 6 is a summary of the testing results for the thirty-two years of testing. The average percentage of positive tests in 1951-52 is the lowest on record for Massachusetts. This summary reveals that Massachusetts is gradually reducing the amount of pullorum infection among its breeding flocks.

Table 6. Thirty-Two Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Per Cent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Per Cent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19
1947-48	494	1,219,957	1,272,547	0.10	476	1,185,852	97.20
1948-49	458	1,179,481	1,213,073	0.04	452	1,171,363	99.31
1949-50	475	1,360,865	1,444,364	0.06	465	1,344,860	98.82
1950-51	448	1,358,540	1,394,192	0.05	442	1,339,068	98.57
1951-52	417	1,343,955	1,370,430	0.016	412	1,324,195	98.53

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: One of the requirements in the Massachusetts pullorum disease regulations is that all birds five months or older in a breeding flock must be tested without reactors in order to qualify for official recognition. This past year 17 flocks were partially tested

and failed to receive official recognition. Flock owners should recognize that partial flock testing does not reveal the true status of a flock and therefore is not a sound procedure in establishing or maintaining pullorum-free flocks.

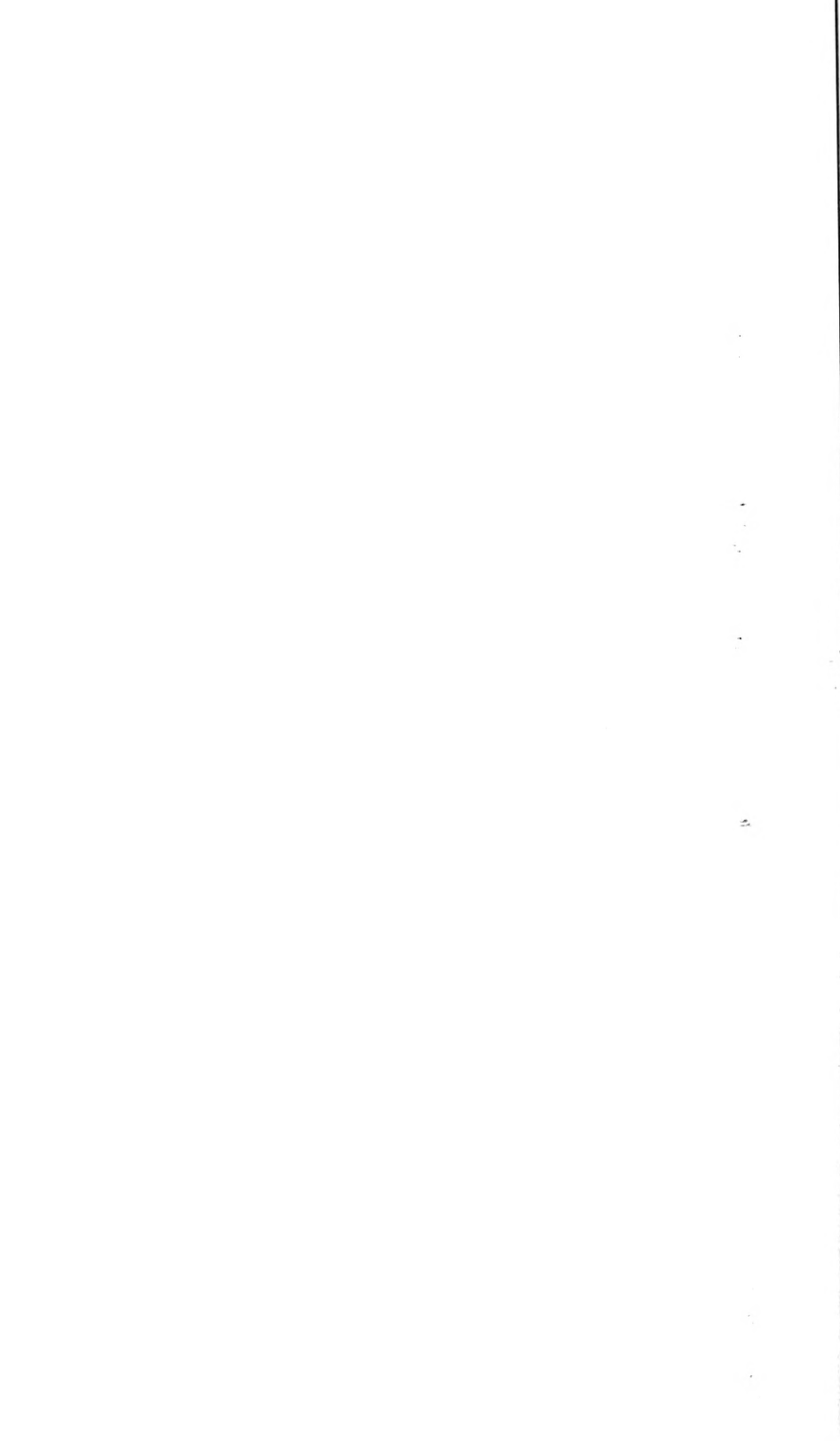
During the past few years split-flock testing has been very common, since replacement stock is being raised throughout the year. Flock owners are urged to have all birds tested at five months of age or before they are used for hatching purposes. Hatching from untested birds may lead to serious trouble even though the previous history of the flock may have been negative for pullorum disease.

The nature of the industry is such that the majority of the replacement stock is hatched during the late winter and spring of the year. This means that the majority of birds become eligible for testing in late summer and fall. The tendency for flock owners to have their flocks tested during late fall and early winter creates a congested period in our testing program which is extremely difficult to meet satisfactorily. Hence, flock owners are urged to have their flocks tested as soon as the birds become five months of age. This will level off the high peak in testing and permit the laboratory to meet the testing demands.

The following summary lists the volume of tests by months:

Months	Number of Tests
April, 1951	51,076
May	59,793
June	64,848
July	97,706
August	117,061
September	173,317
October	214,865
November	192,803
December	163,086
January	173,334
February	52,591
March	41,090
April	4,911
Total	1,406,481

Flock owners should file their applications with the department in ample time to make satisfactory plans for testing. The number of birds to be tested should be stated as accurately as possible, and a sufficient deposit should be submitted to cover the testing service. Flock owners should not expect short notice service because routing schedules are made three weeks in advance of the testing operations. Therefore, flock owners are urged to cooperate to the fullest extent in planning the testing dates in order that the most efficient service may be given.



MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 153

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**Inspection of Commercial
Feedstuffs**

By FEED CONTROL SERVICE STAFF

This is the fifty-eighth report on feeding stuffs inspection. Included are data regarding the composition of mixed feeds, mineral and vitamin supplements, feed ingredients and medicated feeds. Other information of interest to the manufacturers, distributors, and users of feed is also included.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.



INSPECTION OF COMMERCIAL FEEDSTUFFS

By Feed Control Service Staff:

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Associate Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Edward S. Berestka, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

FOREWORD

This bulletin reports the work done by the Feed Control Service on samples officially taken by the State feed inspector.

In addition to the work covered by the data presented here, the Control Service does a great deal of analytical work on unofficial samples. These include feed samples submitted by citizens of the Commonwealth who suspect that the feed in question either lacks some nutritive factor or contains a toxic ingredient.

About 1,500 samples are received each year from State institutions. These samples represent lots delivered to the institutions by manufacturers who mix the feeds according to specifications furnished by the State Purchasing Agent. The feeds are examined microscopically, and chemical analysis are made if necessary. Acceptance or rejection of the feeds is dependent upon the recommendation of the Control Service.

The department participates in check sample programs to be sure that the results of this laboratory are in line with those of other similar laboratories. Collaborative work is carried on in investigations for new and improved methods for the determination of those minerals, vitamins, drugs, and other nutritive factors that are claimed to be present in mixed feeds or feed ingredients.

It has been evident for some time that the time-honored determinations for moisture, protein, fat, fiber, and ash furnish only a small part of the data needed for the evaluation of feed quality. Indeed, with the continued lowering of the fat content of feed ingredients, the determination of fat in mixed feeds may be of questionable value until the critical fat level is reached. Certainly there seems to be little value in either fat guarantees or fat determinations on such materials as alfalfa products, dried skim milk, bone meal, and solvent-extracted vegetable protein meals. Moisture determinations may also be omitted in many cases.

It is time well spent for those in feed control to scrutinize carefully the determinations that are being made. The elimination of tests that have little value provides the time for making other tests that have much greater significance for judging the relative merits of feed ingredients and mixed feeds.

Brands Substantially Complying with Guarantees

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Ackerman-Beardsley-Bennett, Inc.		Beacon Calf Grain.....	1
"Hi-Pro" Corn Distillers Dried Grains	1	Beacon Calf Starter.....	1
Alaska Fish Oil Extractors, Inc.		Beacon Complete Starter.....	1
Afco Blend.....	1	Beacon Dairy Fitting Ration.....	1
Albers Milling Co.		Beacon "22" Egg Mash.....	1
Calf Manna.....	1	Beacon Flething Pellets.....	1
Allied Mills, Inc.		Beacon Goat Ration.....	1
June Pasture.....	1	Beacon "18" Growing Mash.....	1
Sugarine 16% Dairy Feed.....	1	Beacon Market Egg All-Mash.....	1
Wayne All Mash Egg.....	1	Beacon "18" Test Cow Ration.....	1
Wayne All Mash Grower.....	1	Beacon "14" Test Cow Ration.....	1
Wayne Broiler Feed.....	1	Beacon Turkey & Game Bird Breeder	1
Wayne Calf Starter.....	1	Beacon Turkey & Game Bird Fitting	1
Wayne Chick Feed.....	1	Beacon Turkey & Game Bird Grower	1
Wayne Dairy Mixer.....	1	Be-Co-Lass.....	1
Wayne 20% Dairy Ration.....	1	Blatchford Calf Meal Co.	
Wayne 16% Dairy Ration.....	1	Blatchford Calf Meal.....	1
Wayne Egg Mash.....	1	Blatchford Complete Calf Ration....	1
Wayne Fitting Ration.....	1	Borden Grain Co.	
Wayne Growing Mash.....	1	Borden's Sweet 16 Dairy.....	1
Wayne Horse Feed.....	1	Borden's 14 Fitting.....	1
Wayne 26% Mash Supplement.....	1	Borden's Growing Feed.....	1
Wayne 18% Milk Producer.....	1	*Borden's Laying Mash.....	1
Wayne Pork Maker.....	1	Borden's Super Starter and Broiler	1
Wayne Poultry Pasture Pellets.....	1	Feed.....	1
Wayne Rabbit Ration.....	1	George B. Brown Corp.	
Wayne Tail Curler.....	1	Brown's Dairy Feed.....	1
Wayne Turkey and Game Bird		Brown's Egg Mash.....	1
Growing Mash.....	1	Brown's Growing Mash.....	1
American Crystal Sugar Co.		Brown's Pig Feed.....	1
Dried Beet Pulp.....	1	Clinton Foods, Inc.	
American Maize-Products Co.		Clinton Corn Gluten Feed.....	1
Cream of Corn Gluten Feed.....	1	Canada Starch Co., Ltd.	
Arcady Farms Milling Co.		Corn Gluten Feed.....	1
Arcady Sweet Mixing Feed.....	1	Central Soya Co., Inc.	
Arcady Wonderfat Station Feed with		Central Star Brand 44% Solvent	
Rolled Oats.....	1	Extracted Soybean Oil Meal.....	1
Archer-Daniels-Midland Co.		S. J. Cherry & Sons, Ltd.	
Archer Quality 36% Protein Linseed		Wheat Bran.....	1
Oil Meal Solvent Extracted....	1	Wheat Shorts.....	1
Archer Quality 44% Protein Solvent		Clyde Milling Corp.	
Extracted Soybean Oil Meal.....	1	Clyde Complete Calf Starter.....	1
Ashcraft-Wilkinson Co.		Clyde Fitting Ration.....	1
Cow-Eta Brand 41% Protein Cotton-		Clyde Growing Mash.....	2
seed Meal.....	1	Clyde H-E Broiler Ration.....	1
E. W. Bailey & Co.		Clyde Market Egg Mash.....	1
Pennant Brand Growing Mash.....	1	Clyde Milky Las 16.....	1
Pennant Brand Laying Mash.....	1	Clyde Silolas.....	1
Pennant Brand Turkey Fattener.....	1	Clyde Special 16 Dairy Ration.....	1
Barber & Bennett, Inc.		Coatsworth & Cooper, Ltd.	
Ace Dairy Ration.....	1	C & C Wheat Bran.....	1
Fort Orange Dairy Ration.....	2	Commander-Larabee Milling Co.	
Fort Orange 12% Fitting and Calf		Sunfed Wheat Bran with Ground	
Grain Ration.....	2	Screenings not exceeding mill run	1
Fort Orange Golden Test Ration.....	2	Community Service, Inc.	
Fort Orange Horse Feed.....	1	Community Complete Pig Feed.....	1
Fort Orange 15% Test Ration.....	1	Community 18% Dairy Ration.....	1
Beacon Milling Co., Inc.		Community 16% Dairy Ration.....	1
Beacon "20".....	1	Community Fitting Ration.....	1
Beacon Breeders Mash.....	1	Community Growing Mash.....	1
Beacon Broiler Feed.....	1	Community Laying Mash.....	1
Beacon Broiler Finisher Pellets.....	1	Community Starter & Grower Mash .	1

* See also table of "Brands Not Conforming to Guarantees."

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Consolidated Products Co.		Derwood Mills, Inc.	
Kafi-A.....	1	Derwood Horse Crunch.....	1
Consolidated Rendering Co.		Frank Diauto	
Corenco Bone Meal.....	2	Diauto's Broiler Ration.....	1
Corenco Feeding Bone Meal.....	1	Diauto's Growing Mash.....	1
Corenco Fish Meal.....	1	Diauto's Special Egg Mash.....	1
Corenco 50% Meat & Bone Scrap.....	1	F. Diehl & Son, Inc.	
Corenco 45% Meat & Bone Scrap.....	1	Breeder.....	1
Copeland Flour Mills, Ltd.		Fitting.....	1
Dandy Wheat Bran.....	1	Grower.....	1
Dandy Wheat Shorts.....	1	Layer.....	1
Corn Products Refining Co.		Starter.....	1
Buffalo Brand Corn Gluten Feed.....	1	Diétrich & Gambrill, Inc.	
Buffalo Corn Gluten Feed (Sweetened)	1	D & G Breeder Mash.....	1
Diamond Brand Corn Gluten Meal ..	1	D & G Broiler Mash.....	1
Courcy & Sons Grain Co.		D & G Fleshing Pellets.....	1
Courcy's Laying Mash.....	1	D & G Growing & Fitting Ration....	1
Cover Grain & Feed Co.		D & G Poultry Fitting Ration.....	1
C & P Grade A Laying Mash.....	1	D & G Special Broiler Mash.....	1
C & P Growing Mash.....	1	D & G Turkey Growing Mash.....	1
C & P Pig & Hog Feed.....	1	Frederick Laying Mash.....	1
C & P Starter & Broiler Ration.....	1	Gambrill's Laying Mash.....	1
Chas M. Cox Co.		Pen-Mar 20% Dairy.....	1
Wirthmore Calving Ration.....	1	J. L. Dunnell & Son	
Wirthmore Challenger 20 Dairy Ration	1	Excel 18% Dairy Ration.....	1
Wirthmore Complete Breeder Ration..	1	Excel Fitting Ration.....	1
Wirthmore Complete Egg Ration.....	1	Excel Laying Mash.....	1
Wirthmore Complete Growing Ration	1	Starter and Grower—Horner's.....	1
Wirthmore 20 Dairy Ration.....	1	East Longmeadow Grain Store	
Wirthmore 14% Fitting Ration.....	1	Blue Ribbon All Mash Grower.....	1
Wirthmore Growing Mash.....	1	Blue Ribbon All Mash Layer.....	1
Wirthmore Hog Grower.....	1	Blue Ribbon Pig & Hog Feed.....	1
Wirthmore Horse Feed.....	1	Blue Ribbon Starter & Broiler.....	1
Wirthmore Laying Mash.....	1	Eastern States Farmers' Exchange, Inc.	
Wirthmore Pig & Hog Feed.....	1	Eastern States All-Mash Developer ..	1
Wirthmore Poultry Fitting.....	1	Eastern States All-Mash Producer...	1
Wirthmore Producer 16 Dairy.....	1	Eastern States Breeder Mash.....	1
Wirthmore Rabbit Pellets.....	1	Eastern States Calf Starter.....	1
Wirthmore 18 Record Ration.....	1	Eastern States Calving Ration.....	1
Wirthmore 16 Record Ration.....	1	Eastern States Champion.....	1
Wirthmore Starter and Broiler	1	Eastern States Developer.....	1
Ration.....	1	Eastern States Fitting Ration.....	1
Wirthmore Turkey Growing Ration..	1	Eastern States Fulpail.....	1
Wirthmore Twin-Mix Calf Ration....	1	Eastern States Hog Supplement.....	1
Crawford Brothers, Inc.		Eastern States Horse Feed.....	1
Crawford Complete Egg Mash.....	1	Eastern States Milkmore.....	1
Crawford Complete Growing Mash...	1	Eastern States Pig Primer.....	1
Crawford Growing Mash.....	1	Eastern States Pork Builder.....	1
Crawford Special Test 16%.....	1	Eastern States Producer.....	1
Crawford Starter & Broiler Mash....	1	Eastern States 32% Supplement.....	1
Dailey Mills, Inc.		Eastern States Sweepstakes.....	1
Double Diamond Complete Egg	1	Eastern States Turkey Grower.....	1
Producer.....	1	Elmore Milling Co., Inc.	
Double Diamond Fitting Ration 14% ^c	1	Elmore Breeder Mash.....	1
with Pellets.....	1	Elmore Bull Feed.....	1
Double Diamond Horse Feed.....	1	Elmore Clixsaver.....	1
Double Diamond 16% Milk Producer	1	Elmore Complete Broiler Ration....	1
Double Diamond Range Grower.....	1	Elmore Complete Layer and Breeder.	1
Double Diamond Hical Starter.....	1	Elmore Complete Market Egg Mash	1
Double Diamond Hical 16% ^c Test	1	Elmore Complete Rabbit Ration....	1
Ration.....	1	Elmore Dry & Freshening Ration	1
Dawnwood Farms		Pellets.....	1
Dawnwood Farms Caf-Star.....	1	Elmore Fitting Ration.....	1
		Elmore Flaked Pelleted Calf Starter	1
		Elmore Grand Champion Ration....	1
		Elmore Growing Mash.....	1

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Elmore Horse Feed.....	1	General Mills, Inc.	
Elmore Improved Calf Starter.....	1	Washburn's Gold Medal Hard Wheat	
Elmore Milk Grains "Sixteen".....	1	Adrian Red Dog.....	1
Elmore Pacemaker 18% Dairy Ration	1	Washburn's Gold Medal Hard Wheat	
Elmore Pacemaker 16% Dairy Ration	1	Bran and ground wheat screenings not exceeding mill run.....	1
Elmore Stock Feed.....	1		
Elmore Test Ration.....	1	General Mills, Inc., Farm Service Division	
John W. Eshelman & Sons		Farm Service 20% Breeder Mash.....	1
Conestoga 20 Dairy Feed.....	1	Farm Service 20% Broiler Mash.....	1
Pennsy 16 Dairy Feed.....	1	Farm Service Complete Breeder Mash	1
Red Rose Breeder Mash.....	1	Farm Service Complete Layer Mash . .	1
Red Rose Broiler Ration.....	1	Farm Service 20% Dairy Feed.....	1
Red Rose 18 Dairy Feed.....	1	Farm Service 14% Fitting Ration.....	1
Red Rose 16 Dairy Feed.....	1	Farm Service 18% Grower Mash.....	1
Red Rose Fitting Ration.....	1	Farm Service 20% Layer Mash.....	1
Red Rose Growing Mash.....	1	Vigor 20% Dairy Feed.....	1
Red Rose Horse Feed.....	2	General Mills, Inc., Larrowe Division	
Red Rose Laying Mash.....	1	Dried Beet Pulp.....	2
Red Rose Turkey Grower.....	1	Larro 20% Dairy Feed.....	1
Essex County Co-operative Farming Assn.		Larro 16% Dairy Feed.....	1
S-X All-Mash Breeder.....	1	Larro Egg Mash.....	1
S-X All-Mash Egg.....	1	Larro Station Fattener Pellets.....	1
S-X Breeder.....	1		
S-X 18% Dairy Ration.....	1	Glidden Co., Feed Mill Division	
S-X Egg Mash.....	1	Glidden Breeder Mash.....	1
S-X 14% Fitting Ration.....	1	Glidden Finisher Pellets.....	2
S-X Growing Mash.....	1	Glidden Laying Mash.....	1
		Glidden Super Broiler Ration.....	1
Excelsior Milling Co.		Glidden Co., Soya Products Division	
Camel Wheat Mixed Feed.....	1	Diamond G Brand 30% Protein	
		Solvent Extracted Soybean Feed	1
Farm Bureau Assn.		Gloucester By-Products, Inc.	
Farm Bureau 22% Breeder Mash.....	1	Globpro Brand Fish Meal.....	1
Farm Bureau Chick Starter Mash....	1		
Farm Bureau Complete Developer		Grain Processing Corp.	
Mash.....	1	Port City Corn Distillers Dried Grains	
Farm Bureau Complete Market Egg		Solubles.....	1
Mash.....	1		
Farm Bureau Conditioner Mash.....	1	D. H. Grandin Milling Co.	
Farm Bureau Dairy 20%.....	1	Grandin's All-Mash Layer.....	1
Farm Bureau Dairy 18%.....	1	Grandin's Calf Starter.....	1
Farm Bureau Dairy 16%.....	1	Grandin's 14 Fitting Ration.....	1
Farm Bureau Developer Mash.....	1	Grandin's Horse Feed.....	1
Farm Bureau Fitting Ration.....	1	Grandin's 20 Milk Maker.....	1
Farm Bureau High Energy Broiler		Grandin's Start-to-Finish Mash.....	1
and Starter Mash.....	1	Grandin's Stock Feed.....	1
Farm Bureau Market Egg Mash.....	1	Grandin's Super Starter & Broiler	
Farm Bureau Rabbit Food Pellets....	1	Ration.....	1
Farm Bureau Turkey Grower.....	1	Grandin's 16 Test Ration.....	1
Florida Citrus Canners Cooperative		Great Atlantic & Pacific Tea Co.	
Lake Wales Brand Citrus Pulp with		Daily-Egg Laying Mash.....	1
Molasses.....	1	Daily-Growth Growing Mash.....	1
Flory Milling Co., Inc.		Hales & Hunter Co.	
Flory 22% Breeder Mash.....	1	Pioneer Dairy Bull.....	1
Flory 16% Grower Mash.....	1		
Flory Golden Egg Layer Mash.....	1	Pioneer Pelleted Flaked 15 Dairy....	1
Flory 18% Grower Mash.....	1	Red Comb Broiler Mash.....	1
Flory Layer Mash.....	1	Red Comb Egg Mash.....	1
Flory N-er-G Mash.....	1	Red Comb Growing Mash.....	1
Flory Starter Mash.....	1	Red Comb Turkey Finisher Pellets....	1
Fred A. Fountain		Red Comb Turkey Grower.....	1
Fountain's Breeder Mash.....	1	D. Harbeck & Sons	
Fountain's Growing Mash.....	1	Welcome Dairy Feed.....	1
Fountain's Laying Mash.....	1	Welcome Egg Mash.....	1
Fountain's Starting & Broiler Mash..	1	Welcome Growing Mash.....	1
		Welcome Starter and Broiler Mash....	1

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Harper Feed Mills, Inc.		Money's Worth Growing Mash.....	1
Harco Complete Growing Ration.....	1	Money's Worth Laying Mash.....	1
Harco Complete Laying Ration.....	1	Money's Worth Rabbit Pellets.....	1
Harco 20% Dairy Ration.....	1	Money's Worth Starter.....	1
Harco Horse Feed.....	1		
Harco Laying Mash.....	1	Maritime Milling Co., Inc.	
Harco Pig and Hog Meal.....	1	B-B Broiler Ration.....	1
Harco Rabbit Feed (Pelleted).....	1	B-B Complete Laying Ration.....	1
Harco Station Feed.....	1	B-B Conditioning Mash.....	2
Harco Test Cow Ration.....	1	Sweetened Bull Brand 18% Special Dairy Ration.....	1
		Bull Brand Dry and Fresh Cow Fitting Ration.....	1
Holland Pioneer Mills, Inc.		B-B Farmers Mixing Feed 32% Protein	1
Lucky Strike Special Feed.....	1	B-B Horse Feed.....	1
		B-B Ma-Co Breeder Mash.....	2
Humphreys-Godwin Co.		B-B Ma-Co Broiler Ration.....	1
Dixie Brand 41% Cottonseed Meal ..	1	B-B Ma-Co High Energy Complete Breeder Ration.....	1
		Dollar Maker Egg Mash.....	1
Inter-Continental Grain Co., Ltd.		Hi-Test Dairy Feed 20% Pro.....	1
Ranger Brand Pure Wheat Bran.....	1	Marmico 16% Protein Dairy Feed with Molasses.....	1
International Milling Co.		Methuen Grain Co.	
Blackhawk Wheat Bran with ground screenings not exceeding mill run	2	Umpire All-Mash Grower.....	2
Target Wheat Red Dog.....	1	Umpire All-Mash Layer & Breeder...	1
Jaquith & Co.		Minute Maid Corp.	
Jaquith Growing Mash.....	1	Golden Isle Citrus Pulp.....	2
Jaquith Laying Mash.....	1		
Jaquith Starting Mash.....	1	Geo. C. Moon & Co., Inc.	
		Moon Breeder Mash.....	1
Kasco Mills, Inc.		Moon Complete Growing Mash.....	1
Kasco All Mash Grower Ration.....	1	Moon Complete Laying Mash.....	1
Kasco All Mash Layer Ration.....	1	Moon 24% Dairy Ration.....	1
Kasco Beatsall Milk Grains 16%.....	2	Moon Dairy Fitting Ration.....	1
Kasco Body Builder.....	1	Moon Fitting Ration.....	2
Kasco Egg Producer.....	2	Moon Growing Mash.....	1
Kasco Growing Mash.....	1	Moon Hog Feed.....	1
Kasco Pork Producer.....	2	Moon Horse Feed.....	1
Kasco Sweet 16% Dairy Feed.....	1	Moon Laying Mash.....	1
Kasco Turkey Grower.....	1	Moon N. E. Complete Laying Mash ..	1
Kasco Turkey Starter.....	1	Moon Poultry Fitting Ration.....	1
		Moon Rabbit Pellets.....	1
Kellogg Co.		Moon Special A 20% Dairy Ration..	1
Kellogg's Hominy Feed.....	1	Moon Special A 16% Dairy Ration ..	1
		Moon Stock Feed.....	1
Spencer Kellogg & Sons, Inc.		Moon's 32% Supplement Ration.....	1
Spencer Kellogg's 34% Protein Old Process Linseed Oil Meal.....	1	Moon's 18% Test Ration.....	1
Spencer Kellogg's 44% Protein Toasted Soybean Oil Meal Solvent Extracted.....	1	Moon Turkey Fattener Mash.....	1
Kronick's Coal & Grain Co.		Jas. F. Morse & Co.	
Kronick's Dairy Ration 16%.....	1	Morse's 45% Meat & Bone Scraps... ..	1
Kronick's Egg Mash.....	1		
Kronick's Starter-Grower Mash.....	1	National Distillers Products Corp.	
		Nadrisol Brand Corn Distillers Dried Solubles.....	1
Kuder Pulp Sales Co.		Produlac Brand Dried Corn Distillers Grains with Solubles.....	2
Kuder Dried Citrus Pulp High Sugar Late Production.....	1		
		Neumond Co.	
Lauhoff Grain Co.		Neumond's Distillers Dried Grains... ..	1
Vermilion Hominy Feed.....	1		
		Ogden Grain Co.	
L. B. Lovitt & Co.		Ogden Complete Pellets.....	1
Lovitt Brand 41% Protein Cottonseed Meal.....	1	Ogden Complete Starter-Grower-Layer-Breeder.....	1
		Ogden 16% Dairy Feed.....	1
Mackenzie & Winslow, Inc.		Ogden Fitting Ration.....	1
Money's Worth Complete Growing ..	1	Ogden Growing Mash.....	1
Money's Worth Complete Mash.....	1	Ogden Hi-Energy Starter & Broiler ..	1
Money's Worth Dairy Feed 16%.....	1	Ogden Horse Feed.....	1
Money's Worth Fitting Ration.....	1	Ogden Layer & Breeder.....	1
		Ogden Super Pig Ration.....	1

Brands Substantially Complying with Guarantees—Continued

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
Ogilvie Flour Mills Co., Ltd.		Ful-O-Pep Growing Mash.....	1
Ground Flax Screenings.....	1	Ful-O-Pep Laying Mash.....	1
Ogilvie Wheat Bran.....	1	Ful-O-Pep Milking Feed.....	1
Ogilvie Wheat Shorts.....	1	Ful-O-Pep Super Greens.....	1
Oswego Soy Products Corp.		Ful-O-Pep Turkey Grower.....	1
Soy Bean Oil Meal Toasted.....	2	Quaker Pig-N-Hog Feed.....	1
Palm Grain Co.		Quaker Sugared Schumacher Feed... 1	1
Palm's Complete Mash.....	1	Yellow Hominy Feed.....	1
Park & Pollard Co., Inc.		Ralston Purina Co.	
Lay or Bust All Mash Grower.....	1	41% Protein Cottonseed Meal.....	1
Lay or Bust All Mash Layer.....	1	Northeastern Special Dairy 18%.....	1
Lay or Bust Breeder Mash.....	1	Purina B & M Cow Chow.....	1
Lay or Bust Broiler Mash.....	1	Purina Breeder Lay Chow (for heavy	2
Lay or Bust Duck Fattener.....	1	breeds).....	
Lay or Bust Egg Mash.....	1	Purina Breeder Layena (for heavy	1
Lay or Bust Fleshing Pellets.....	1	breeds).....	
Lay or Bust Growing Feed.....	1	Purina Broiler Chow.....	1
Lay or Bust Hi-Power Broiler Ration	1	Purina Broiler Chow Finisher.....	1
Lay or Bust Hi-Valu Scratch Pellets .	1	Purina Calf Chow.....	1
Lay or Bust Laying Pellets.....	1	Purina Chick Growena.....	1
Lay or Bust Poultry Fitting Ration..	1	Purina Chick Growing Chow.....	1
Lay or Bust Turkey Grower.....	1	Purina Commercial Layena.....	1
Lay or Bust Turkey Starter.....	1	Purina Cow Chow 18%.....	1
Milk-Maid Bulky Sweet Dairy.....	1	Purina Cow Chow 16%.....	1
Milk-Maid Calf Meal.....	1	Purina D & F Chow.....	1
Milk-Maid Calf Starter Mix.....	1	Purina Flock Chow.....	1
Milk-Maid Calf Starter Pellets.....	1	Purina Hog Fatena.....	1
Milk-Maid 20% Dairy Ration.....	1	Purina Milk Chow 18%.....	1
Milk-Maid 16% Dairy Ration.....	1	Purina Milk Chow 16%.....	1
Special Milk-Maid 16% Dairy.....	1	Purina Omolene.....	1
Milk-Maid Fitting Ration.....	1	Purina Poultry Booster Checkers... 1	1
Milk-Maid Test Cow Ration 18%.....	1	Purina Rabbit Chow Checkers (Com-	1
Milk-Maid 14% Test Ration.....	1	plete Ration).....	
Park & Pollard Go-Tu-It Pig & Hog	1	Purina Roaster Chow.....	1
Ration.....	1	Purina Turkey Fatena.....	2
Park & Pollard Rabbit Pellets.....	1	Purina Turkey Growena.....	1
Park & Pollard Stock Feed.....	1	44% Protein Solvent Extracted Soy-	1
George H. Parker Grain Co.		bean Oil Meal.....	
Parker's High A 16% Dairy Feed....	1	John Reardon & Sons Division of	
Parker's High A 14% Fitting Ration.	1	Wilson & Co., Inc.	
Parker's Layer-Breeder Mash.....	1	Register Brand Fish Meal.....	1
Parrish & Heimbecker, Ltd.		Register Brand 45% Protein Meat	1
Parrheim Pure Wheat Bran.....	1	and Bone Scrap.....	
Parrheim Pure Wheat Shorts.....	1	D. F. Riley	
Pasco Packing Co.		Riley's 16% Dairy Ration.....	1
Sugar-Sweet Citrus Meal.....	2	Riley's 18% Laying Mash.....	1
Sugar-Sweet Citrus Pulp.....	1	Russell-Miller Milling Co.	
Perkins Oil Co.		Hard Wheat Occident Standard Midd-	1
Golden Rod Brand 41% Protein Cot-	1	lings, Ground Wheat Screenings	
ton Seed Meal.....		not exceeding mill run.....	
Pilgrim Feed Co.		Hard Wheat Occident Mixed Feed.	1
Pilgrim Egg & Breeder Mash.....	1	Ground Wheat Screenings not	
Pillsbury Mills, Inc.		exceeding mill run.....	
Pillsbury's XX Daisy Wheat Red Dog	2	Ryther & Warren Co.	
R. C. Pratt & Co., Ltd.		Blue Tag Dairy Ration.....	3
Ruler Brand Pure Wheat Bran.....	1	Minot Egg Mash.....	2
Quaker Oats Co.		Minot Growing Mash.....	1
Barley Feed.....	1	Joseph E. Seagram & Sons, Inc.	
Ful-O-Pep 22% Protein Broiler Mash	1	Seagram's Corn Distillers Dried Grains	1
Ful-O-Pep Chick Starter.....	1	J. H. Smith Grain Co.	
Ful-O-Pep Dairy Feed.....	1	Smith's All Mash Growing and Laying	1
Ful-O-Pep Fitting Feed.....	1	Southern Cotton Oil Co.	
		Sco-Co Brand 41% Protein Cotton-	1
		seed Meal.....	

Brands Substantially Complying with Guarantees—Concluded

Manufacturer and Brand	Number of Samples Analyzed	Manufacturer and Brand	Number of Samples Analyzed
A. E. Staley Manufacturing Co.		C. P. Washburn Co.	
Staley's Corn Gluten Feed.....	1	Made Right Breeder.....	1
44% Protein Solvent Extracted Soybean Oil Meal.....	1	Made Right 20% Dairy.....	1
41% Protein Expeller Soybean Oil Meal.....	1	Made Right 16% Dairy.....	1
Stratton & Co.		Made Right Fitting.....	1
Wheat Bran, mill run of ground screenings.....	1	Made Right Growing Feed.....	1
Wheat Standard Middlings, ground screenings not exceeding mill run.....	1	Made Right High Energy Broiler.....	1
Wheat White Middlings.....	1	Made Right Laying Mash.....	1
Wheat Mixed Feed, Wheat screenings not exceeding mill run.....	1	Made Right Pig Feed.....	1
Taft Bros.		Made Right Starting Feed.....	1
Taft Dairy Feed.....	1	Made Right Stock Feed.....	1
Taft Laying Mash.....	1	H. K. Webster Co.	
Taunton Grain Co.		Blue Seal All-Mash Breeder's Ration.....	1
Balanced Ration.....	1	Blue Seal All-Mash Egg Ration.....	1
Fitting Ration.....	1	Blue Seal All-Mash Growing Ration.....	1
Growing Mash.....	1	Blue Seal Breeder's Mash.....	1
Laying Mash.....	1	Blue Seal Calf Grower.....	1
Turkey Starter.....	1	Blue Seal "20" Dairy Ration Coarse.....	1
Winneconnet Turkey Growing.....	1	Blue Seal "16" Dairy Ration Coarse.....	1
United Cooperative Farmers, Inc.		Blue Seal Fattening Pellets.....	1
UCF All Mash Grower & Layer.....	1	Blue Seal Fitting Ration.....	1
UCF Breeder.....	1	Blue Seal Goat Feed.....	1
UCF Fitting Ration.....	1	Blue Seal Growing Mash.....	1
UCF Layer.....	1	Blue Seal Horse Feed.....	1
UCF Millmaker.....	1	Blue Seal Rabbit Pellets.....	1
UCF Stock Feed.....	1	Blue Seal Succulent Feed and Calving Ration.....	1
Unity Feeds, Inc.		Blue Seal Super Mash.....	1
Unity Complete Growing Mash.....	1	Blue Seal Super Starter and Broiler.....	2
Unity Complete Rabbit Pellets.....	1	Blue Seal Test Ration.....	1
Unity 16% Dairy Feed.....	1	West-Nesbitt, Inc.	
Unity Fleshing Pellets.....	1	Pure Feed Dairy Ration 20%.....	1
Unity Growing Mash.....	1	Pure Feed 16% Dairy Ration.....	1
Unity Horse Feed.....	1	Wirthmore Grain Co.	
Unity Laying Mash.....	1	Preferred Complete Growing Mash.....	1
Unity Super Ration.....	1	Preferred Complete Laying Ration.....	1
Unity Tri-Way Mash.....	1	Preferred Growing Mash.....	1
Unity Turkey Finishing Pellets.....	1	Preferred Laying Mash.....	1
Unity Turkey & Game Bird Growing Mash.....	1	Preferred Turkey Starter & Grower.....	1
Ventura Grain Co.		Wood's 16% Dairy Feed.....	1
Every-Day Complete Grower & Layer Mash.....	1	Wood's Stock Feed.....	1
Every-Day Dairy 22%.....	1	Worcester Grain & Coal Co.	
Every-Day 20% Dairy.....	1	F-Ish-N-C Hog Grow.....	3
Every-Day 16% Dairy.....	2	*Just Right 16% Dairy Feed.....	2
Every-Day 14% Dairy & Fitting.....	1	*Just Right Laying Mash 20%.....	1
Every-Day Grower Mash.....	1	Just Right Laying Mash 16%.....	1
Every-Day High Energy Broiler Mash.....	1	Yantic Grain & Products Co.	
Every-Day Layer-Breeder Mash.....	1	20% Dairy Ration.....	1
Every-Day Starter Mash.....	1	20% Laying Mash.....	1
Every-Day Starter & Broiler Mash.....	1	Yieldmor Feeds, Inc.	
O. B. Vunck & Son		Central Sweet 20% Dairy Feed.....	1
Cortland Developer Mash.....	1	Central Sweet 16% Dairy Feed.....	1
Cortland Laying Mash.....	1	Central 20% Egg Mash.....	1
Cortland Rabbit Pellets.....	1	Central Growing Mash.....	1
Cortland Starter-Broiler Mash.....	1	Regular Broiler Feed.....	1
Cortland Supreme Ration.....	1	Yieldmor Calf Pellets.....	1
		Yieldmor 16% Sweet Dairy.....	1
		Yieldmor Rabbit Pellets.....	1
		Yieldmor Turkey Grower.....	1

* See also table of "Brands Not Conforming to Guarantees."

Brands Not Conforming to Guarantees

This table includes brands that are one percent or more under guarantee in protein or fat or are one-and-one-half percent or more over guarantee in fiber.

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Beacon Milling Co., Inc. *Nitrosal Mix Beacon Turkey Starter . . .	24.3	28.0	3.9	3.5	4.3	4.75	7.8
Borden Grain Co. + Borden's Laying Mash	18.0	20.0	5.9	4.0	6.1	8.0	11.0
Crawford Brothers, Inc. Crawford Hi-Energy Starter & Broiler Mash	22.3	21.0	4.4	4.0	5.9	3.0	8.0
Crawford Rabbit Pellets	18.9	16.0	4.1	3.0	12.7	9.0	5.3
F. Diehl & Son, Inc. Dairy	16.8	18.0	4.1	3.5	8.4	12.0	7.3
Essex County Co-operative Farming Assn. S-X All-Mash Growing	13.8	15.0	4.7	3.75	4.4	6.0	6.6
S-X Starter and Broiler Connecticut Formula	18.8	20.0	4.8	4.0	4.2	4.5	6.8
Jaquith & Co. Jaquith 20% Dairy Ration	18.2	20.0	3.1	3.5	7.5	10.0	8.7
John Jervis Grain Co., Ltd. Jervis Pure Wheat Shorts	14.6	16.0	5.3	5.0	7.2	8.0	4.3
Mackenzie & Winslow, Inc. Money's Worth Dairy Feed 20%	18.4	20.0	3.6	4.0	6.9	9.5	6.3
Money's Worth Turkey Fattener	11.2	12.0	3.8	3.0	7.6	6.0	5.1
Maritime Milling Co., Inc. B-B Complete Rabbit Feed (Pellets)	17.9	17.5	3.2	3	15.0	12.0	7.6
George H. Parker Grain Co. Bill McHugh's Thorobred Horse Feed . . .	13.0	14.0	4.0	3.5	6.9	10.0	5.1
Parker's Special Starter & Broiler Mash	19.0	21.0	4.5	4.5	2.9	3.0	7.3
Sea Board Supply Co. Crab Meal	28.5	31.0	1.8	1.0	14.5	11.0	49.8
Suni-Citrus Products Co. Sweet Suni-Citrus Pulp	7.3	6.0	2.0	5.0	13.4	15.0	5.8
H. K. Webster Co. Blue Seal Calf Starter	17.6	19.0	3.8	3.5	8.0	7.5	5.5
Blue Seal Egg Mash	16.1	20.0	5.1	3.5	6.0	7.0	8.1
Wirthmore Grain Co. Bliss Dairy Ration	17.7	20.0	4.0	4.0	6.8	10.0	7.2
Worcester Grain & Coal Co. + Just-Right 16% Dairy Feed	14.3	16.0	5.5	3.5	8.9	10.0	5.6
Just-Right 16% Dairy Feed	15.0	16.0	4.6	3.0	9.3	8.0	5.2
Just-Right Growing Mash	15.6	18.0	3.8	3.5	8.6	9.0	8.1
Just-Right Growing Mash	16.8	18.0	3.9	3.5	10.1	9.0	8.7
+ Just-Right Laying Mash 20%	17.5	20.0	4.5	3.5	8.4	7.5	8.1
Just-Right Laying Mash 18%	15.6	18.0	4.4	3.5	7.8	9.0	8.3
Just-Right Laying Mash 18%	16.8	18.0	3.9	3.5	10.0	9.0	8.5

* Active Nitrosal found 0.052%, guaranteed 0.039%.

+ See also table of "Brands Substantially Complying with Guarantees"

Brands Containing Drugs

These brands substantially complied with guarantees of protein, fat and fiber, except as noted.

Manufacturer and Brand	Sulfaquinoxaline	
	Found	Guaranteed
Allied Mills, Inc. Sulfaquinoxaline incorporated in Wayne Broiler Feed.....	0.0135	0.0125
E. W. Bailey & Co. Sulfaquinoxaline mixed in Bailey's Pennant Brand Broiler Ration.....	0.0103	0.0125
Sulfaquinoxaline mixed in Bailey's Pennant Brand Chick Starter.....	0.0100	0.0125
Beacon Milling Co., Inc. Sulfaquinoxaline mixed with Beacon Broiler Feed.....	0.0113	0.0125
Sulfaquinoxaline mixed with Beacon Complete Starter.....	0.0112	0.0125
Chas. M. Cox Co. Sulfaquinoxaline mixed with Wirthmore Complete Growing Ration.....	0.0131	0.0125
Sulfaquinoxaline mixed with Wirthmore Starter and Broiler Ration.....	0.0130	0.0125
Eastern States Farmers' Exchange, Inc. Sulfaquinoxaline incorporated in Minuteman.....	0.0525	0.05
John W. Eshelman & Sons Sulfaquinoxaline incorporated in Red Rose Chick Starter.....	0.0081	0.0125
Sulfaquinoxaline incorporated in Red Rose Hi-Lo Broiler Ration.....	0.0079	0.0125
Essex County Co-operative Farming Assn. Sulfaquinoxaline incorporated in S-X Starter and Broiler Ration.....	0.0033	0.0125
Farm Bureau Assn. Sulfaquinoxaline mixed with Farm Bureau Chick Starter Mash.....	0.0113	0.0125
Sulfaquinoxaline mixed with Farm Bureau Chick Starter Mash.....	0.0140	0.0125
Sulfaquinoxaline mixed with Farm Bureau High Energy Broiler & Starter Mash.....	0.0158	0.0125
Sulfaquinoxaline mixed with Farm Bureau High Energy Broiler & Starter Mash.....	0.0128	0.0125
Sulfaquinoxaline mixed with Farm Bureau High Energy Broiler & Starter Mash.....	0.0115	0.0125
General Mills, Inc., Larroe Division Sulfaquinoxaline incorporated in Larro Turkey Builder.....	0.0155	0.0175
Maritime Milling Co., Inc. Sulfaquinoxaline incorporated in B-B Ma-Co Broiler Ration.....	0.0845	0.1
Geo. Q. Moon & Co., Inc. Sulfaquinoxaline incorporated in Moon Starter Mash.....	0.0110	0.0125
Park & Pollard Co., Inc. Sulfaquinoxaline incorporated in Hi-Power Broiler Ration.....	0.0113	0.0125
Sulfaquinoxaline incorporated in Lay or Bust Starter & Broiler Pellets.....	0.0115	0.0125
Ralston Purina Co. Sulfaquinoxaline in Purina Broiler Checkers.....	0.0088	0.0125
Sulfaquinoxaline in Purina Broiler Chow Starter.....	0.0100	0.0125
Sulfaquinoxaline in Purina Chick Grownea.....	0.0105	0.0125
Sulfaquinoxaline in Purina Chick Startena.....	0.0108	0.0125
Sulfaquinoxaline in Purina Turkey Startena.....	0.0182	0.0175
United Cooperative Farmers, Inc. Sulfaquinoxaline mixed with UCF Starter.....	0.0097	0.0125
Sulfaquinoxaline mixed with UCF Starter.....	0.0120	0.0125
Sulfaquinoxaline mixed with UCF Super Starter.....	0.0098	0.0125
Sulfaquinoxaline mixed with UCF Super Starter.....	0.0130	0.0125
C. P. Washburn Co. Sulfaquinoxaline mixed with Made Right High Energy Broiler.....	0.0113	0.0125
Sulfaquinoxaline mixed with Made Right Starting Feed.....	0.0116	0.0125
H. K. Webster Co. Sulfaquinoxaline Mixture Blue Seal All Mash Growing Ration.....	0.0128	0.0125
Sulfaquinoxaline Mixture Blue Seal Super Starter and Broiler.....	0.0119	0.0125

(Continued)

Brands Containing Drugs—(Concluded)

Manufacturer and Brand	Nitrophenide	
	Found	Guaranteed
Eastern States Farmers' Exchange, Inc. Nitrophenide incorporated in Pacemaker.....	0.0140	0.0125
Fred A. Fountain Megasul Fountain's Starting & Broiler Mash.....	0.0060	0.0125
Glidden Co., Feed Mill Division Nitrophenide (Megasul) incorporated with Glidden Chick Starter.....	0.0230	0.02
Hales & Hunter Co. Nitrophenide (Megasul) incorporated with Red Comb Chick Starter.....	0.0163	0.0125
Lederle Laboratories Division, American Cyanamid Co. Megasul 25% Nitrophenide.....	25.4000	25.0
Maritime Milling Co., Inc. Nitrophenide incorporated in B-B Ma-Co Broiler Ration..... Nitrophenide incorporated in B-B Ma-Co Broiler Ration..... Nitrophenide incorporated in B-B Ma-Co Broiler Ration.....	0.0284 0.0348 0.0270	0.025 0.025 0.025
Swift & Co. Nitrophenide mixed with Swift's 21% Special Broiler Ration.....	0.0200	0.025
Unity Feeds, Inc. Nitrophenide (Megasul) in Unity Advance Ration..... Nitrophenide (Megasul) in Unity Super Ration..... Nitrophenide (Megasul) in Unity Super-Gro Ration.....	0.0160 0.0175 0.0175	0.01875 0.01875 0.01875
Wirthmore Grain Co. Nitrophenide in Preferred Starter & Broiler Ration.....	0.0080	0.0125
	Enheptin	
	Found	Guaranteed
Allied Mills, Inc. Enheptin incorporated in Wayne Turkey Growing Mash.....	0.071	0.10
Eastern States Farmers' Exchange, Inc. Enheptin incorporated in Eastern States Turkey Grower.....	0.054	0.05
Lederle Laboratories Division, American Cyanamid Co. Enheptin 20% Premix.....	23.600	20.0
Ralston Purina Co. Enheptin in Purina Turkey Growena.....	0.044	0.05
	Active Nitrosal	
	Found	Guaranteed
Beacon Milling Co., Inc. Nitrosal Mix Beacon Broiler Feed..... Nitrosal Mix Beacon Complete Starter..... *Nitrosal Mix Beacon Turkey Starter.....	0.036 0.035 0.052	0.039 0.039 0.039
General Mills, Inc., Farm Service Division Nitrosal Mix Farm Service 20% Broiler Mash..... Nitrosal Mix Farm Service 20% Chick Starter.....	0.034 0.047	0.039 0.039

* See also table of "Brands Not Conforming to Guarantees."

Dry Dog Foods

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Ajax Dog Food Co. Ajax Kibbled Biscuits.....	20.9	20	1.9	1.5	1.4	3	4.5
Allied Mills, Inc. Wayne Dog Food Krums.....	27.0	25	6.1	7	3.7	5	11.7
Animal Foundation, Inc. Hunt Club Full Diet Dog Meal.....	26.3	25	5.1	5	2.8	4	9.4
Bannock Food Co., Inc. Bannock Body Builder.....	27.7	24	6.3	3.5	4.4	4.5	14.5
Barber & Bennett, Inc. Fort Orange Dog Food.....	29.5	25	5.3	5	5.5	5	9.7
Beacon Milling Co., Inc. Beacon Dog Pellets.....	28.8	26	5.6	4	4.1	5	10.6
Best Dog Food Co. Vita Best Kibblan Meal.....	25.9	20.84	5.2	1.9	2.9	4.05	11.9
Vita Best Kibblan Meal.....	24.7	24	5.4	4	2.6	4	12.1
Borden Co., Special Products Division Borden's Dog Food.....	25.0	25	6.4	5.5	4.6	5	8.7
Cal-Cod Process Co. Cal-Cod Dog Food.....	24.2	25	4.1	4	3.2	4	16.4
Champion Animal Food Co. Champion Dog Snax.....	29.0	25	6.0	3.5	1.8	3	14.6
Chas. M. Cox Co. Wirthmore Dog Food.....	20.0	25	8.1	7	4.1	5	12.7
John C. Dow Co. Dow's Dog Biscuits.....	25.0	21	3.5	3	1.5	2	7.0
Dow's New Improved Crunchy.....	24.6	21	4.7	2.5	1.7	2	7.1
Drackett Products Co. Charge—Treat for Dogs.....	14.0	9	13.5	9	1.3	2	4.0
East Longmeadow Grain Store P & D Dog Meal.....	25.9	24.5	6.8	4	3.7	5.5	8.1
Eastern States Farmers' Exchange, Inc. Eastern States Dog Feed.....	24.1	24	6.2	5.5	3.8	4	8.2
Elmore Milling Co., Inc. Elmore Completely Balanced Dog Food ..	23.7	22	4.8	3	2.8	3	10.4
John W. Eshelman & Sons Red Rose Dog & Puppy Food.....	27.9	23	4.0	4.75	4.0	4.5	11.5
General Foods Corp., Gaines Division Gaines Krunchon.....	26.3	25	5.7	6	3.8	5	9.4
Gaines Meal.....	25.1	25	6.6	6	4.0	5	8.2
Great Atlantic & Pacific Tea Co. Daily Dog Meal.....	25.6	23	3.5	3.5	3.1	4.5	8.9
Hales & Hunter Co. Lucky Dog Food.....	28.5	25	4.0	3	2.8	6	8.3
Hartz Mountain Products, Inc. Dog Yummies.....	31.9	25.5	3.2	2.4	3.4	5.9	10.0
Hi-Life Packing Co. Daily Dog Food Biscuit.....	21.4	22	3.6	3	2.5	3.5	7.9
Daily Dog Food Kibbled Biscuit.....	24.0	22	4.0	3	2.5	3.5	4.2
	23.5	22	3.0	3	2.3	3.5	3.4
Kasco Mills, Inc. Kasco Complete Dog Ration.....	27.7	25	8.7	7	3.4	4	11.5
Kasco Complete Dog Ration Pellets.....	28.9	25	4.0	4	3.7	4	10.1

(Continued)

Dry Dog Foods—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed	
Kellogg Co.							
Kellogg's Gro-Pup Dog Food.....	26.6	25	5.4	5	4.4	4	6.8
	25.7	25	4.5	5	4.0	4	6.6
Kennel Food Supply Co., Inc.							
Cero-Meato Dog Food.....	21.0	21	2.0	2	2.2	3	11.3
K.F.S. Biscuits.....	22.4	21	4.2	2	1.8	3	7.4
K.F.S. Fairfield Dog Meal.....	25.2	20.5	3.6	2.63	2.5	3.62	14.0
Libner Grain Co.							
Libner's Dog Food.....	*25.6	28	5.5	4	2.7	3	12.9
	31.4	28	7.7	4	3.4	3	20.4
Mansfield Milling Co.							
Full Cry Dog Meal.....	22.4	23	6.9	5	2.9	5	16.2
Geo. Q. Moon & Co., Inc.							
Moon's Dog Food.....	24.0	24	6.1	4	3.7	4	10.4
National Biscuit Co.							
Milk-Bone Dog Biscuit.....	23.7	21	2.4	1.5	2.0	2.5	5.8
Pal Dog Biscuit.....	21.2	18.5	2.3	1	2.0	2.5	5.3
Old Mother Hubbard Dog Food Co., Inc.							
Old Mother Hubbard Three Formula Kibbled Dog Biscuits.....	23.4	20	5.4	2	1.5	3	6.8
Old Trusty Dog Food Co., Inc.							
Old Trusty Kibbled Dog Food.....	24.9	23	4.7	2.5	2.2	2	6.7
Park & Pollard Co., Inc.							
Munchy Dog Food.....	29.0	26	6.9	6	3.2	4.5	10.1
Quaker Oats Co.							
Ken-L-Biskit.....	21.7	20	5.2	3.5	1.8	3	5.9
	20.6	20	5.5	3.5	2.1	3	6.8
Ken-L-Meal.....	21.2	21	3.8	4	3.0	4.5	5.6
Ralston Purina Co.							
Purina Dog Chow Kibbled Meal.....	25.7	24	5.6	5	5.3	5	11.6
	24.1	24	5.7	5	3.9	5	8.5
Spratt's Patent (America) Ltd.							
Spratt's Assorted Biscuits.....	20.5	20	2.5	2	1.8	7.5	3.0
Spratt's Bonio.....	21.2	20	2.0	2	1.3	1.5	4.0
Spratt's Fibo.....	22.6	22	2.4	2	1.2	1.5	3.0
Spratt's Ovals.....	22.3	20	2.0	2	1.1	1.5	3.1
Sturdy Dog Food Co.							
Sturdy Kibbled Ration.....	20.7	21	2.4	3	2.1	2	9.7
	21.8	21	4.3	3	2.2	2	10.1
Sunshine Biscuits, Inc.							
Austin's Dog Food.....	22.1	22	2.6	2.5	4.2	4.5	7.1
	24.4	22	3.2	2.5	3.4	4.5	6.9
Swift & Co.							
Swift's Pard Meal.....	27.7	26	8.2	7.5	4.0	6.0	9.3
Vitality Mills, Inc.							
Vitality Brand Body Builder Dog Food...	26.7	26	5.9	5	1.2	5.5	8.1
Vitality Brand Breeders' Dog Food.....	29.2	26	6.1	5	4.6	5	7.5
Vitality Brand Dog Vittles.....	24.9	24	4.6	3	4.7	5.5	6.8
Vitality Brand Kibbled Biscuits.....	21.1	20	2.2	1.75	1.5	3	7.1
O. B. Vunck & Son							
Grow-Rite Dog Food.....	25.8	25	7.9	7	3.1	4	5.6
	*23.9	25	7.8	7	3.2	4	7.3

* Deficient in protein.

Alfalfa Meals

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligrams per Pound
	Found	Guar- anteed	Found	Guar- Found	Found	Guar- anteed		
Barton Mills, Inc. 17% Alfalfa Meal.....	17.1	17	2.7	1.5	27.7	27	11.5	9.4
	17.6	17	*	1.5	26.8	27	10.6	6.2
Bremco Mills, Inc. Med-O-Green Alfalfa Meal 17%.....	16.8	17	2.7	1.5	26.6	27	7.5	28.8
	15.4	15	2.1	1.5	29.7	30	7.8	18.5
Med-O-Green Alfalfa Meal 15%.....	15.7	15	*	1.5	29.0	30	8.5	19.9
	18.0	17	3.0	2	24.0	27	10.6	63.5
A. B. Caple Co. 17% Capex Dehydrated Alfalfa Meal.....	17.0	17	2.7	2	26.1	27	9.0	55.0
	18.8	17	3.9	2	21.0	27	10.0	51.9
Caro-Green, Inc. Caro-Green Dehydrated Alfalfa Meal 17%.....	17.4	17	3.3	2	24.0	27	8.8	39.9
	17.6	17	*	1.5	27.6	27	10.9	49.3
Caro-Green, Inc. Caro-Green Dehydrated Alfalfa Meal 17%.....	19.6	17	2.9	1.5	21.6	27	11.4	13.8
	17.7	17	2.5	1.5	26.9	27	9.1	19.5
Keystone Dehydrators Keystone Super-Green Dehydrated Alfalfa Meal.....	18.0	17	2.7	2	25.4	27	10.1	31.2
	18.1	17	*	2	20.8	27	8.9	25.0
Miller Alfalfa Co. Dehydrated Alfalfa Meal.....	17.9	17	2.8	2	28.5 _a	27	9.4	33.4
	17.3	17	*	2	25.0	27	9.9	37.4
Morrison & Quirk 17% Dehydrated Alfalfa Meal.....	17.8	17	2.5	1.5	21.9	27	13.2	40.4
	18.6	17	*	1.5	29.0 _a	27	10.6	10.5

a Excessive fiber

b Protein deficient

* Not determined

(Continued)

Alfalfa Meals—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Carotene Milligrams per Pound
	Found	Guar- anteed	Found	Guar- Found	Found	Guar- anteed		
National Alfalfa Dehydrating & Milling Co. 17% Dehydrated Alfalfa Meal.....	17.7	17	*	1.5	24.8	27	10.2	55.6
Nebraska Feed Products Co. Dehydrated Alfalfa Meal 17%.....	18.2	17	*	1.75	26.9	27	9.9	56.1
Portage Valley Milling Co. Blended 17 Valley Green Dehydrated Alfalfa Meal.....	15.7b 16.4	17 17	2.6 2.6	1.5 1.5	22.4 25.5	27 27	8.1 8.7	43.1 34.4
Robinson Farms Alfalfa Meal.....	17.5	15	1.2	1.5	24.5	30	9.1	3.0
Saunders Mills, Inc. Dehydrated Alfalfa Meal 17.....	17.7	17	2.5	1.5	22.8	30	9.3	29.8
Schoeneck Farms, Inc. Schoeneck's Super-Green Dehydrated Alfalfa Meal.....	17.0 17.1	17 17	* *	2 2	29.3a 22.8	27 27	10.7 10.2	24.3 30.6
W. J. Small Co., Inc. Small's 17% Dehydrated Alfalfa Meal.....	18.2 18.4 17.7 19.2	17 17 17 17	3.0 * 3.3 *	1.75 1.75 1.75 1.75	24.9 23.2 26.4 23.6	27 27 27 27	10.8 10.9 10.7 10.7	26.1 70.5 39.9 45.4
Small's 15% Dehydrated Alfalfa Meal.....	17.4 17.9	17 17	* *	1.75 1.75	25.5 26.4	27 27	9.3 10.4	40.9 11.0
Small's 15% Dehydrated Alfalfa Meal.....	15.8	15	*	1.5	30.7	30	9.9	15.5

a Excessive fiber **b** Protein deficient * Not determined

Vitamin Supplements and Special Feed Ingredients

The protein, fat and fiber contents of the brands listed in this table were found to be as guaranteed, except as otherwise noted in footnote.

Manufacturer and Brand	Riboflavin Milligrams per Pound		Choline Milligrams per Pound		Vitamin D International Chick Units per Pound	
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed
Borden Co., Special Products Division						
Borden's MF-FL Blend 30D.....	24.7	22.7	1.430	1,300	Guarantee sustained	13,620
Commercial Solvents Corp.						
*B.Y.-500 Dried Corn Fermentation Solubles.....	230	227				
B.Y.-500 Dried Corn Fermentation Solubles.....	282	227				
Dawe's Manufacturing Co.						
Dawe's Broiler Base.....	62.8	No guarantee				
Dawe's Riboflavin Supplement.....	239	227				
Dawe's Sterol D.....	60.7	No guarantee			Guarantee sustained	681,000
Dawe's Swine Base.....	62.7	No guarantee				
Dawe's Vitamelk Base.....	32.5	No guarantee				
Dawe's Vitamelk Base.....	41.0	31.75	2,100	3,000	Guarantee not sustained	22,700
Dawe's Vitamelk Base.....	35.6	31.75			Guarantee sustained	22,700
Dawe's Vitamelk Base Ruminant Type.....	17.2	15.4	1,750	1,816		
Dawe's Vitamelk Base Ruminant Type.....	19.9	15.4			Guarantee sustained	18,160
Flavonne Riboo-D.....	25.8	22.7	2,215	1,816	Guarantee sustained	18,160
Flavonne Riboo-D.....	23.1	22.7				
Gorton-Pew Fisheries Co.						
Gorton's Al-Fish Blend "Junior".....	16.4	18				
Gorton's Al-Fish Blend "Junior".....	17.0	18				
Gorton's Al-Fish Blend "Senior".....	16.0	14				
Merck & Co., Inc.						
No. 54 Riboflavin Mixture.....	16,200	16,000				

* Deficient in protein. Protein guaranteed 35%; found 33.7%

(Continued)

Vitamin Supplements and Special Feed Ingredients—Concluded)

Manufacturer and Brand	Riboflavin Milligrams per Pound		Choline Milligrams per Pound		Vitamin D International Chick Units per Pound	
	Found	Guar- anteed	Found	Guar- anteed	Found	Guar- anteed
Phenix Pabst-ett Co. Kraco Dried Cheese Whey..... Kraco Dried Cheese Whey.....	11.2 11.8	No guarantee No guarantee				
Publicker Industries, Inc. Paco "500" Dried Grain Fermentation Solubles.....	246	227				
Schenley Distillers, Inc. Schenley's Soludri.....	5.5	No guarantee				
Joseph E. Seagram & Sons, Inc. Seagram's Corn Distillers Dried Solubles.....	8.4	No guarantee				
U. S. Industrial Chemicals, Inc. Riboflavin Supplement No. 4.....	4,446	4,000				
Whitmoyer Laboratories, Inc. Clo-Meal..... Clo-Meal..... Clo-Meal..... Clo-Meal..... Flav-A-Dee..... Gro-Tein..... Gro-Tein.....	66 70 70 70 62.7 29.4 26.4	70 70 70 70 40 20 20	10,526 7,990 4,440 4,472 7,560	7,000 3,500 3,500 8,000		54,480
					Guarantee sustained	

Fish Liver Oils

L. R. Parkinson, in charge of the Nutrition Laboratory, cooperated with the Feed Control Service in the chick assay of the vitamin D fish liver oils.

Manufacturer and Brand	Vitamin D International Chick Units per Gram Guaranteed	Guarantee	Vitamin A U.S.P. Units per Gram Guaranteed	Guarantee
Alaska Fish Oil Extractors, Inc.				
Alaska Brand A & D Feeding Oil...	300	Sustained	1,500	Sustained
Alaska Brand A & D Feeding Oil	300	Not determined	1,500	Sustained
Gorton-Pew Fisheries Co., Ltd.				
A & D Feeding Oil.....	975	Sustained	2,250	Sustained
Marden-Wild Corp.				
Marden Cod Liver Oil.....	300	Sustained	1,500	Not determined
Marden's Poultry Feeding Cod Liver Oil.....	300	Sustained	1,500	Not sustained
Marden's Vitamin A & D Feeding Oil	300	Sustained	1,500	Sustained
Marden's Vitamin A & D Feeding Oil	300	Sustained	1,500	Sustained
Marden's Vitamin A & D Feeding Oil	300	Sustained	750	Sustained
Marine Products Co.				
Cod Liver Oil Poultry Feed Grade..	400	Sustained	2,000	Not sustained
Silmo Chemical Corp.				
Silmo Vitamin A & D Oil.....	300	Sustained	1,500	Sustained
Whitmoyer Laboratories, Inc.				
Whitmoyer Cod Liver Oil Con- centrate.....	400	Not determined	1,500	Sustained
Whit-Cod Cod Liver Oil Concentrate	300	Sustained	2,250	Sustained
Whit-Cod Cod Liver Oil Concentrate	300	Sustained	2,250	Sustained
Whitmoyer Cod Liver Oil Whitcod.	300	Not determined	1,500	Sustained
Whitmoyer Quality A & D Feeding Oil.....	300	Sustained	1,500	Sustained
Whitmoyer Quality A & D Feeding Oil.....	300	Sustained	1,500	Sustained
Whitmoyer Quality A & D Feeding Oil.....	300	Sustained	1,500	Sustained
Whitmoyer Quality A & D Feeding Oil.....	300	Not determined	1,500	Sustained
Whitmoyer Quality Cod Liver Oil Oil Concentrate.....	300	Sustained	1,500	Sustained

Oat Products

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Results of Microscopic Examination
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed		
Best Foods, Inc. Pulverized White Oats.....	12.3	-	5.5	-	8.6	-	3.1	As represented
Coatsworth and Cooper, Ltd. Master Feeds Ground Oats.....	10.2	-	4.4	-	11.6	-	3.1	As represented
Chas. M. Cox Co. Ground Oats.....	11.3	-	4.5	-	11.1	-	3.1	As represented
Doughboy Industries, Inc. New Rich Pulverized White Oats.....	11.2 11.0	11 11	3.0 3.9	3 3	13.8 13.6	13 13	4.1 4.2	As represented As represented
Fruen Milling Co. Fruen's Crescent Brand Pulverized White Oats.....	11.9 11.6 11.0	11 11 11	3.4 3.9 3.7	4 4 4	13.9 12.2 12.6	13 13 13	5.1 5.2 4.3	As represented Appears to be ground grain screenings As represented
Mixer's Coarse Ground White Oats.....	9.7	10	3.4	2.5	14.4	15	4.0	Contains less than 80 percent oats. Appears to be a mixture of oat and barley grain screenings.
Frank B. Ham & Co., Ltd. Hamco Brand Ground Oats.....	10.3 10.0 8.8	- - -	3.2 3.9 3.5	- - -	11.8 14.5 16.6	- - -	3.1 3.1 3.4	As represented As represented Either ground very light weight oats or this is a mixture of ground oats and ground oat hulls.
D. Harbeck & Sons Ground Oats.....	11.1	-	3.7	-	8.8	-	2.6	As represented
W. L. Hogg, Ltd. Ground Oats..... Ground Mixed Feed Oats.....	11.7 10.4	- -	4.5 3.1	- -	9.3 12.4	- -	3.3 3.9	As represented Appears to be ground grain screenings.
John Jervis Grain Co., Ltd. Jervis Brand Ground Oats.....	11.5 8.5	- -	4.0 3.6	- -	15.0 16.2	- -	4.1 4.0	Appears to be ground mixed screenings. Either ground very light weight oats or a mixture of ground oats and oat hulls.

Oat Products—Concluded

Manufacturer and Brand	Protein		Fat		Fiber		Ash	Results of Microscopic Examination
	Found	Guar-anteed	Found	Guar-anteed	Found	Guar-anteed		
John Mackay Milling Ltd. Fine Ground White Oats.....	8.9*	11	3.0	3	18.1*	13	4.3	This is a mixture of ground oats and ground oat hulls. Appears to be a ground mixture of oats and oat hulls.
	8.4*	11	2.6	3	19.7*	13	4.4	
Geo. Q. Moon & Co., Inc. Ground Oats.....	11.8	—	4.4	—	10.0	—	3.1	As represented
Ottawa District Farmers Co-Operative Ground Canadian Oats.....	11.4	—	3.2	—	10.9	—	3.3	As represented
R. C. Pratt & Co., Ltd. Ruler Brand Ground Canadian Oats.....	10.2	—	4.6	—	13.1	—	3.4	As represented
Ralston Purina Co. Crimped Whole Oats.....	11.7	11.5	4.5	4	10.9	12	3 0	As represented.
	12.2	—	4.0	—	11.1	—	3.4	As represented
	11.0	—	4.8	—	10.4	—	3.0	As represented
James Richardson & Sons, Ltd. Ground Oats.....	11.5	—	3.6	—	10.5	—	3.5	As represented
	11.3	11	3.2	3.5	12.5	12.5	4.9	Appears to be ground grain screenings. Product contains less than 80 percent cultivated oats. Appears to be ground grain screenings. Sample is ground grain screenings.
10.9	11	3.6	3.5	11.8	12.5	4.9		
St. Cloud Milling Co. Pulverized White Oats.....	10.7	11	3.9	3.5	11.4	12.5	5.2	As represented.
	11.0	—	4.3	—	11.2	—	3.0	

*Deficient in protein; fiber excessive.

Directory of Manufacturers Who Registered Feedingsuffs for Sale in Massachusetts in 1952

- L. P. Adams Co., 484 Housatonic St., Dalton, Mass.
 Adams Packing Association, Inc., Auburndale, Florida
 Ajax Dog Food Co., 49 Pine St., Dedham, Mass.
 Alaska Fish Oil Extractors, Inc., 4800 South Richmond St., Chicago, Ill.
 Albers Milling Co., 6130 Avalon Blvd., Los Angeles 3, Cal.
 E. T. Allen Co., P. O. Box 951, Atlanta 1, Ga.
 Allied Mills, Inc., Chicago, Ill.
 American Crystal Sugar Co., 600 Boston Bldg., Denver, Col.
 American Maize-Products Co., 100 East 42nd St., New York 17, N. Y.
 Animal Foundation, Inc., Sherburne, N. Y.
 Arcady Farms Milling Co., 500 West 138th St., Chicago 27, Ill.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2, Minn.
 Ashcraft-Wilkinson Co., 601 Trust Co. of Georgia Bldg., Atlanta 3, Ga.
- E. W. Bailey & Co., Montpelier, Vt.
 Bannock Food Co., Inc., E. Biddle St., West Chester, Penn.
 Barber & Bennett, Inc., Albany, N. Y.
 Battle Creek Dog Food Co., 60 E. State St., Battle Creek, Mich.
 Beacon Milling Co., Inc., Cayuga, N. Y.
 Best Dog Food Co., 447 Timpson Place, Bronx 55, N. Y.
 Best Foods, Inc., 1442 Marine Trust Bldg., Buffalo 3, N. Y.
 Blatchford Calf Meal Co., 2 Madison St., Waukegan, Ill.
 Borden Co., Special Products Division, 350 Madison Ave., New York 17, N. Y.
 Borden Grain Co., 700 West Water St., Taunton, Mass.
 Borden's Soy Processing Co., Division of the Borden Co., Kankakee, Ill.
 Bremco Alfalfa Mills, Inc., New Bremen, Ohio
 George B. Brown Corp., Ipswich, Mass.
 Brown Oil & Chemical Corp., 2581 Richmond Ter., Staten Island, 2 N. Y.
 Buckeye Cotton Oil Co., Cincinnati 1, Ohio
- Cal Cod Process Co., New Hamburg, N. Y.
 Canada Starch Co., Ltd., Sun Life Bldg., Montreal, Que., Canada
 Canadian Vegetable Oil Processing, Ltd., Hamilton, Ont., Canada
 A. B. Cagle Co., Toledo 5, Ohio
 Cargill, Inc., 116 Corn Exchange, Minneapolis 15, Minn.
 Caro-Green, Inc., 328 Board of Trade Bldg., Kansas City, Mo.
 Central Mills, Inc., Dunbridge, Ohio
 Central Soya Co., Inc., 300 Fort Wayne Bank Bldg., Fort Wayne 2, Ind.
 Cerophyl Laboratories, Inc., 2348 Broadway, Kansas City 10, Mo.
 H. E. Clark Co., 419 Main St., Winfield, Kan.
 Clinton Foods, Inc., Clinton, Iowa
 Clyde Milling Corp., Clyde, N. Y.
 Coatsworth and Cooper, Ltd., 67 Yonge St., Toronto, Ont., Canada
 Commander-Larabee Milling Co., 600 Baker Arcade, Minneapolis, Minn.
 Commercial Solvents Corp., 105 S. 7th St., Terre Haute, Ind.
 Community Service, Inc., Canaan, Conn.
 Consolidated Chemical Industries, Inc., 630 Fifth Ave., New York, N. Y.
 Consolidated Products Co., 119 N. Washington Ave., Danville, Ill.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
- Copeland Flour Mills, Ltd., Midland, Ont., Canada
 Corn Products Refining Co., 17 Battery Place, New York 4, N. Y.
 Courcy & Sons Grain Co., Taunton, Mass.
 Cover Grain & Feed Co., 150 Middle St., Lowell, Mass.
 Chas. M. Cox Co., 177 Milk St., Boston 9, Mass.
 Crawford Brothers, Inc., Walton, N. Y.
- Dailey Mills, Inc., Olean, N. Y.
 Dairymen's League Co-operative Association, Inc., 100 Park Ave., New York 17, N. Y.
 Dawe's Manufacturing Co., 4800 S. Richmond Ave., Chicago 32, Ill.

- Dawnwood Farms, Smithfield Road, Amenia, N. Y.
 Decatur Milling Co., Inc., 717 North Union St., Decatur, Ill
 Delaware Mills, Inc., Deposit, N. Y.
 Delphos Grain & Soya Products Co., 201 S. Jefferson St., Delphos, Ohio
 Derwood Mills, Inc., Derwood, Md.
 Dewart Milling Co., Ltd., 93 Simcoe St., Peterborough, Ont., Canada
 Frank Diauto, 87 Warren St., Randolph, Mass.
 F. Diehl & Son, Inc., 180 Linden St., Wellesley 81, Mass.
 Dietrich & Gambrill, Inc., South Carroll St., Frederick, Md.
 Distillers Corp., Ltd., Lafleur Ave., Ville LaSalle, Que., Canada
 John C. Dow Co., 40 Prospect St., Gloucester, Mass.
 Drackett Products Co., 5020 Spring Grove Ave., Cincinnati 32, Ohio
 J. L. Dunnell & Son, Bernardston, Mass.
 E. I. du Pont de Nemours & Co., Wilmington, Del.
- Eagle Roller Mill Co., New Ulm, Minn.
 Eastern States Farmers' Exchange, Inc., 26 Central St., West Springfield, Mass.
 B. A. Eckhart Milling Co., 1300 Carroll Ave., Chicago 7, Ill.
 Edwards Milk Products Co., 166 West Jackson Blvd., Chicago 4, Ill.
 Elk Valley Alfalfa Mills, a Division of Midland Industries, Inc., Independence, Kan.
 Elmore Milling Co., Inc., Oneonta, N. Y.
 Erie Alfalfa Mills, Inc., Erie, Mich.
 John W. Eshelman & Sons, 244 North Queen St., Lancaster, Penn.
 Essex Count Co-operative Farming Association, Topsfield, Mass.
 Excelsior Milling Co., 712 Flour Exchange, Minneapolis, Minn.
- Falk & Co., 104 Grain Exchange, Minneapolis, Minn.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Farmers Feed Co., 532 East 76th St., New York 21, N. Y.
 Feed Products, Inc., Groveland, Florida
 Ferneau Grain Co., Gibson Bldg., Blanchester, Ohio
 First National Stores, Inc., 5 Middlesex Ave., Somerville, Mass.
 Florida Citrus Cannery Cooperative, Lake Wales, Florida
 Flory Milling Co., Bangor, Penn.
 Fred A. Fountain, 55 Tremont St., Taunton, Mass.
- Nicholas Gangone, Plympton St., R. D. No. 2, Middleboro, Mass.
 General Foods Corp., Birds Eye Division, 209 New Boston St., Woburn, Mass.
 General Foods Corp., Corn Mill Division, Kankakee, Ill.
 General Foods Corp., Gaines Division, 180 S. Dearborn Ave., Kankakee, Ill.
 General Mills, Inc., 400 Second Ave., South, Minneapolis, Minn.
 General Mills, Inc., Farm Service Division, 530 McKnight Bldg., Minneapolis 1, Minn.
 General Mills, Inc., Larrowe Division, Detroit 2, Mich.
 Glidden Co., Feed Mill Division, 1160 West 18th St., Indianapolis, Ind.
 Glidden Co., Soya Products Division, 1825 N. Laramie Ave., Chicago 39, Ill.
 Gloucester By-Products, Inc., Gloucester, Mass.
 Gorton-Pew Fisheries Co., Ltd., 327 Main St., Gloucester, Mass.
 D. H. Grandin Milling Co., Jamestown, N. Y.
 Great Atlantic & Pacific Tea Co., 817 Andrus Bldg., Minneapolis, Minn.
- Hales & Hunter Co., 141 West Jackson Blvd., Chicago 4, Ill.
 D. Harbeck & Sons, 405 Earle St., New Bedford, Mass.
 Harper Feed Mills, Inc., 271 West Wheeling St., Washington, Penn.
 Hartz Mountain Products, 36 Cooper Square, New York 3, N. Y.
 Hercules Powder Co., Dairy Products Division, 821 Marquette Ave., Minneapolis 2, Minn.
 Dr. Hess & Clark, Inc., 7th & Orange Streets, Ashland, Ohio
 Hi Life Packing Co., 431 South Dearborn St., Chicago 5, Ill.
 Holland Pioneer Mills, Inc., Ohio City, Ohio
 H. P. Hood & Sons, Inc., 500 Rutherford Ave., Boston 29, Mass.
 Hubinger Co., 601 Main St., Keokuk, Iowa
 Humphreys-Godwin Co., 2246 Park Ave., Memphis, Tenn.
- Illinois Cereal Mills, Inc., 613 South Jefferson Ave., Paris, Ill.
 Illinois Yeast Co., Princeton, Ill.

Independent Tallow Co., 39 Cedar St., Woburn, Mass.
 Inter-Continental Grain Co., Ltd., 2 King Street East, Toronto, Ont. Canada
 International Milling Co., 800 McKnight Bldg., Minneapolis, Minn.

Jaquith & Co., Inc., 305 Main St., Woburn, Mass.
 John Jervis Grain Co., Ltd., Toronto, Ont., Canada
 Juice Industries Division, Clinton Foods, Inc., Dunedin, Florida

Kansas Flour Mills Co. (Trade Name of) Flour Mills of America, Inc., Kansas City 13, Mo.
 Kasco Mills, Inc., 435 Fulton St., Waverly, N. Y.
 Kellogg Co., Battle Creek, Mich.
 Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.
 Kennel Food Supply Co., Inc., 63 Mill Hill Ter., Fairfield, Conn.
 Keystone Dehydrators, Nazareth, Penn.
 H. C. Knoke & Co., 5728 West Roosevelt Road, Chicago 50, Ill.
 Chas. A. Krause Milling Co., P. O. Box 1156, Milwaukee 1, Wis.
 Kronick's Coal & Grain Co., 43 Pleasant St., Adams, Mass.
 Kuder Pulp Sales Co., Lake Alfred, Florida

Land O'Lakes Creameries, Inc., 2215 Kennedy St. N. E., Minneapolis 13, Minn.
 Lauhoff Grain Co., 320 E. North St., Danville, Ill.
 Lederle Laboratories Division, American Cyanamid Co., Pearl River, N. Y.
 Libby, McNeill & Libby, 4134 S. Packers St., Chicago 9, Ill.
 Libner Grain Co., Inc., 25 Commerce St., Norwalk, Conn.
 Limestone Products Corporation of America, 122 Main St., Newton, N. J.
 L. B. Lovitt & Co., 314 Cotton Exchange Bldg., Memphis, Tenn.

McCabe Grain Co., Ltd., 409 Grain Exchange, Winnipeg, Man., Canada
 Mackenzie & Winslow, Inc., Fall River, Mass.
 Mansfield Milling Co., Mansfield, Mass.
 Maple Leaf Milling Co., Ltd., Toronto, Ont., Canada
 Marianna Sales Co., 510 Cotton Exchange Bldg., Memphis, Tenn.
 Maritime Milling Co., Inc., 1009 Chamber of Commerce, Buffalo 2, N. Y.
 Merchants Creamery Co., 536 Livingston St., Cincinnati 14, Ohio
 Merrimack Farmers' Exchange, Inc., 10 Pleasant St. Ext., Concord, N. H.
 Methuen Grain Co., Inc., Osgood St., Methuen, Mass.
 Miller Alfalfa Co., Defiance, Ohio
 Miner-Hillard Milling Co., 826 Second National Bank Bldg., Wilkes-Barre, Penn.
 Minute Maid Corp., Leesburg, Florida
 Geo. Q. Moon & Co., Inc., 201 Chenango St., Binghamton, N. Y.
 Jas. F. Morse & Co., 11 Horace St., Somerville, Mass.
 Morton Salt Co., 120 South LaSalle St., Chicago 3, Ill.
 Mount Vernon Milling Co., Mount Vernon, Ind.
 Myzon, Inc., 1142 West Roscoe St., Chicago 13, Ill.

National Alfalfa Dehydrating & Milling Co., 101 South 4th St., Lamar, Col.
 National Biscuit Co., 449 West 14th St., New York 14, N. Y.
 National Biscuit Co., Toledo Mill, 2221 Front St., Toledo, Ohio
 National Distillers Products Corp., 120 Broadway, New York 5, N. Y.
 National Vitamin Products Co., 3401 Hiawatha Ave., Minneapolis 6, Minn.
 Near's Food Co., Inc., 115 Montgomery St., Binghamton, N. Y.
 Neumond Co., 300 Merchants Exchange Bldg., St. Louis 2, Mo.

Ogden Grain Co., Utica, N. Y.
 Ogilvie Flour Mills Co., Ltd., Montreal, Que., Canada
 Old Mother Hubbard Dog Food Co., Inc., 40 Prospect St., Gloucester, Mass.
 Old Trusty Dog Food Co., 278 West St., Needham Heights 94, Mass.

Oswego Soy Products Corp., Oswego, N. Y.

Palm Grain Co., Lowell, Mass.
 Park & Pollard Co., Inc., 356 Hertel Ave., Buffalo 7, N. Y.
 George H. Parker Grain Co., 56 Water St., Danvers, Mass.
 Pasco Packing Co., Dade City, Florida
 Patent Cereals Co., Geneva, N. Y.

- Perkins Oil Co., 727 Beale Ave., Memphis 1, Tenn.
Phenix Pabst-ett Co., 460 East Illinois St., Chicago, Ill.
Pillsbury Mills, Inc., Minneapolis 2, Minn.
Pillsbury Mills, Inc., Feed and Soy Division, Clinton, Iowa
Pittsford Flour Mills, Inc., Schoen Place, Pittsford, N. Y.
Plymouth Citrus Products Cooperative, Plymouth, Florida
Portage Valley Milling Co., Bradner, Ohio
Post Cereals Division, General Foods Corp., 275 Cliff St., Battle Creek, Mich.
R. C. Pratt & Co., Ltd., 18 Toronto St., Toronto, Ont., Canada
- Quaker Oats Co., Merchandise Mart Plaza, Chicago 54, Ill.
- Ralston Purina Co., 835 South Eighth St., St. Louis 2, Mo.
John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
D. F. Riley, North Hatfield, Mass.
Riverside Elevator Co., 1366 Penobscot Bldg., Detroit, Mich.
Rodney Milling Co., 1550 West 29th St., Kansas City 8, Mo.
Rudhard Products, Inc., 248 Michigan Ave., Buffalo 3, N. Y.
Russell-Miller Milling Co., 900 Midland Bank Bldg., Minneapolis 1, Minn.
Ryther & Warren Co., Belchertown, Mass.
- Schenley Distillers, Inc., 350 Fifth Ave., New York 1, N. Y.
Schoeneck Farms, Inc., R. D. No. 3, Nazareth, Penn.
Sea Board Supply Co., 35th & Grays Ferry Ave., Philadelphia 46, Penn.
Joseph E. Seagram & Sons, Inc., Seventh St. Road, Louisville 1, Ky.
Sherwin-Williams Co., 101 Prospect Ave., Cleveland, Ohio
W. J. Small Co., Division of Archer-Daniels-Midland Co., 1200 Oat St., Kansas City 6, Mo.
Allen V. Smith, Inc., Marcellus Falls, N. Y.
J. H. Smith Grain, Inc., 102 Hale St., Haverhill, Mass.
Southern Cotton Oil Co., Columbia, S. C.
Southern Fruit Distributors, Inc., Orlando, Florida
Sperti Products, Inc., 816 Clinton St., Hoboken, N. J.
Spratt's Patent (America), Ltd., 18 Congress St., Newark 5, N. J.
A. E. Staley Manufacturing Co., 22nd & Eldorado Streets, Decatur, Ill.
Standard Milling Co., 309 West Jackson Blvd., Chicago 6, Ill.
Stock-Gro, Inc., 228 North LaSalle St., Chicago 1, Ill.
Stratton & Co., 57 Commercial St., Penacook, N. H.
Sturdy Dog Food Co., 2103 West Genesee St., Syracuse 4, N. Y.
Sunshine Biscuits, Inc., Milling Division, Mechanic St., Grafton, Ohio
Swift & Co., Union Stock Yards, Chicago 9, Ill.
Swift & Co., Eastern Feed Sales Division, 1215 Harrison Ave., Harrison, N. J.
Swift & Co., Soybean Mill, Fostoria, Ohio
- Taft Bros., Uxbridge, Mass.
Taunton Grain Co., Taunton, Mass.
Tioga Mills, Inc., Waverly, N. Y.
Tri Associates, Inc., 8500 Pillsbury Ave., S., Minneapolis 20, Minn.
- Union Starch & Refining Co., 301 Washington St., Columbus, Ind.
United Cooperative Farmers, Inc., 339 Broad St., Fitchburg, Mass.
Unity Feeds, Inc., 177 Milk St., Boston 9, Mass.
- Valier & Spies Milling Co., (Trade Name of) Flour Mills of America Inc., Kansas City 13, Mo.
Van Iderstine Co., 37-30 Review Ave., Long Island City 1, N. Y.
Ventura Grain Co., 7 Purchase St., Taunton, Mass.
Vitality Mills, Inc., 141 West Jackson Blvd., Chicago 4, Ill.
- Hiram Walker & Sons, Inc., Peoria, Ill.
C. P. Washburn Co., Middleboro, Mass.
H. K. Webster Co., 24 West St., Lawrence, Mass.
West-Nesbitt, Inc., 26-34 Market St., Oneonta, N. Y.
Western Condensing Co., Appleton, Wis.
Whitmoyer Laboratories, Inc., Myerstown, Penn.
Wilson's Corn Products, Inc., East 4th St., Rochester, Ind.

Wirthmore Grain Co., Taunton

Worcester Grain & Coal Co., 294 Franklin St., Worcester 8, Mass.

Yieldmor Feeds, Inc., 101 South Downing St., Piqua, Ohio

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MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 154

AUGUST 1952

**Inspection of Commercial
Fertilizers
and
Agricultural Lime Products**

BY FERTILIZER CONTROL SERVICE STAFF

This is the seventy-ninth report of the Massachusetts Fertilizer Control made in accordance with Chapter 94, Sections 250 to 261, inclusive, of Massachusetts General Laws 1920, as amended by Chapter 67, Acts of 1933.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

INSPECTION OF COMMERCIAL FERTILIZERS AND AGRICULTURAL LIME PRODUCTS FOR THE SEASON OF 1952

BY FERTILIZER CONTROL SERVICE STAFF

John W. Kuzmeski, *Research Professor, Official Chemist*
Albert F. Spelman, *Associate Research Professor*
C. Tyson Smith, *Associate Research Professor, Microscopist*
Robert T. Wetherbee, *Assistant Research Professor*
Joseph Bart, *Research Instructor*
Edward S. Berestka, *Research Instructor*
Joseph A. Martell, *Technical Assistant*
Joseph Conklin, *Inspector*
Cora B. Grover, *Principal Clerk*

PERTINENT FACTS RELATING TO MASSACHUSETTS FERTILIZER LAW

Commercial Fertilizers

Registration is required annually on January 1.

Registration fee is \$8 for each element: nitrogen, phosphoric acid, potash, magnesia.

Label must show:

Net weight of fertilizer

Name, brand or trade mark, and grade

Name and address of manufacturer

Guaranteed analysis: nitrogen, available phosphoric acid, water soluble potash. A guarantee of total phosphoric acid may be used instead of available phosphoric acid for bone, untreated phosphate rock, tankage, dried and pulverized manures, ground seeds, and wood ashes.

Tonnage reports are required semi-annually, on January 1 and July 1

Tonnage fee: 6 cents per ton of 2,000 pounds

Lime Products

Registration is required annually on January 1.

Registration fee: \$12 for each brand.

Label must show:

Net weight of product

Name, brand or trade mark, and form of lime

Name and address of manufacturer

Guaranteed analysis: calcium oxide, magnesium oxide, carbonates of calcium and magnesium, or calcium sulphate (in gypsum or land plaster)

Make checks payable to Massachusetts Agricultural Experiment Station and send correspondence to

JOHN W. KUZMESKI
Massachusetts Agricultural Experiment Station
Amherst, Mass.

FERTILIZER TONNAGE

Tonnage of Fertilizer Sold in Massachusetts

	1950		1951	
	Jan. 1 to July 1	July 1 to Dec. 31	Jan. 1 to July 1	July 1 to Dec. 31
Mixed fertilizers.....	58,401	8,792	58,414	8,797
Fertilizer chemicals and materials unmixed.....	8,577	4,384	9,126	3,562
Pulverized animal manures.....	1,411	570	1,565	737
TOTALS.....	68,389	13,746	69,105	13,096

Tonnage of Mixed Fertilizers, January 1 to December 31, 1951

Grade*	Tonnage		Brands	Grade *	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31			Jan. 1 to July 1	July 1 to Dec. 31	
5-10-10	13,767	1,608	29	6-10-4	310	119	6
5-8-7	9,259	836	20	4-12-16	307	94	—
6-3-6	7,754	229	13	3-12-6	285	4	—
0-14-14	5,477	236	10	8-12-12	272	186	—
7-7-7	5,330	1,039	16	5-10-3	210	157	—
5-10-5	4,900	946	28	8-8-8	202	59	—
8-16-16	2,333	487	11	6-8-8	134	—	—
4-12-4	1,332	69	8	10-6-4	110	22	—
10-10-10	1,188	335	—	4-16-20	80	41	—
8-6-2	592	157	8	0-12-8	74	210	—
3-12-12	479	348	—	5-5-15	69	—	—
8-6-4	422	282	5	0-12-24	62	217	—
0-20-20	366	305	7	Miscellaneous	2,778	808	—
4-12-8	322	7	6	TOTALS	58,414	8,801	249

*The grade represents the plant food guarantee and is expressed in the order of nitrogen, available phosphoric acid, potash.

Tonnage of Unmixed Materials, January 1 to December 31, 1951

Material	Tonnage		Brands
	Jan. 1 to July 1	July 1 to Dec. 31	
Superphosphate.....	2,212	1,253	11
Process tankage and activated sewage.....	1,926	968	—
Pulverized animal manures.....	1,565	737	32
Nitrate of soda.....	1,343	322	—
Bone meal.....	912	229	15
Cottonseed meal.....	812	335	—
Muriate of potash.....	506	102	7
Castor pomace.....	246	62	—
Sulfate of ammonia.....	222	39	9
Rock phosphate.....	178	46	—
Linseed meal.....	—	30	—
Miscellaneous.....	769	176	—
TOTALS.....	10,691	4,299	103

MIXED FERTILIZERS

Deficiency Statistics for Mixed Fertilizers

Manufacturer	Number of Samples		Number of Tests				
	Analyzed	With No Deficiencies	Totals	Less than $\frac{1}{4}$ Per Cent Below Guarantee	Between $\frac{1}{4}$ and $\frac{1}{2}$ Per Cent Below Guarantee	Between $\frac{1}{2}$ and $\frac{3}{4}$ Per Cent Below Guarantee	More than $\frac{3}{4}$ Per Cent Below Guarantee
American Agricultural Chemical Co.	68	67	133	1	0	0	0
Apothecaries Hall Co.	22	22	68	0	0	0	0
Armour Fertilizer Works.	17	7	50	4	2	0	4
F. A. Bartlett Tree Expert Co.	1	1	3	0	0	0	0
Joseph Breck & Sons Corp.	3	2	10	1	0	0	0
Carbola Chemical Co., Inc.	1	3	3	0	0	0	0
Central Chemical Corp.	1	0	3	0	0	0	1
Consolidated Rendering Co.	30	21	74	5	3	1	0
Davison Chemical Corp.	9	5	27	6	0	0	0
Eastern States Farmers' Exchange, Inc.	19	13	67	1	5	0	0
Essex County Cooperative Farming Association.	4	4	13	0	0	0	0
Faesy & Besthoff, Inc.	2	1	6	0	0	1	0
Farm Bureau Assn.	6	4	20	1	1	0	0
Fox Point Chemical Co.	5	4	19	1	0	0	0
Frank's Market Garden.	1	1	3	0	0	0	0
Frost & Higgins Co.	1	0	3	1	0	0	0
Goulard & Olena, Inc.	3	3	9	0	0	0	0
C. L. Halvorson Tree Service.	1	1	3	0	0	0	0
A. H. Hoffmzn, Inc.	1	1	3	0	0	0	0
Hydroponic Chemical Co., Inc.	1	1	3	0	0	0	0
Hy-Trous Corp.	1	1	3	0	0	0	0
International Minerals & Chemical Corp.	35	31	82	2	3	0	0
Lexington Gardens, Inc.	1	1	3	0	0	0	0
Old Deerfield Fertilizer Co., Inc.	28	25	84	3	1	0	0
Olds & Whipple, Inc.	10	9	32	0	0	0	1
F. G. Phillips Co.	1	0	3	0	2	0	0
Plantabbs Corp.	1	1	3	0	0	0	0
Ra-Pid-Gro Corp.	1	0	3	0	0	0	1
Rogers & Hubbard Co.	16	16	47	0	0	0	0
Rose Manufacturing Co.	1	0	3	0	0	0	1
O. M. Scott & Sons Co.	2	2	6	0	0	0	0
Sears, Roebuck & Co.	6	4	18	1	0	1	0
M. L. Shoemaker Div. of Wilson & Co., Inc.	1	1	2	0	0	0	0
Smith Agricultural Chemical Co.	2	2	6	0	0	0	0
Stimulant Laboratories Co.	1	1	3	0	0	0	0
Swift & Co., Plant Food Division.	8	5	23	2	1	0	1
Universal Chemical Co.	1	1	3	0	0	0	0
C. J. Washburn Co.	3	1	9	2	0	0	0
Woodruff Fertilizer Works, Inc.	1	0	3	0	1	0	0
TOTALS.....	316	260	856	31	19	3	9

Mixtures Showing a Commercial Shortage of \$1 or More per Ton

Manufacturer and Brand	Nitrogen Found		Available Phosphoric Acid Found	Water Soluble Potash (K ₂ O) Found	Approximate Commercial Shortage Per Ton
	Water Insoluble Organic	Total			
Armour Fertilizer Works Armour's Big Crop 0-20-20	—	—	18.40	20.20	\$2.88
Central Chemical Corp. Farmrite Rose Food 7-8-5.	.70	5.39	10.03	5.73	*
Faesy & Besthoff, Inc. Rose Food 8-10-4.	3.27	7.40	10.00	5.25	*
F. G. Phillips Co. Ferti-Flora 3-3-3.	—	2.53	2.66	3.50	*
Swift & Co. Plant Food Div. Vigoro C. G. 8-8-8.	—	7.84	8.07	7.21	1.20

* Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient brands.

EXPLANATION OF TABLE OF ANALYSES

Guarantee. The plant food guarantee or the grade of each fertilizer is made a part of the trade name under the heading "Name of Manufacturer and Brand" and is expressed as nitrogen, available phosphoric acid, and water soluble potash in that order.

Mixtures Substantially Complying with the Guarantee. In addition to those fertilizers that meet their guarantees in every respect, this table includes also a list of those mixtures that have one or more elements below the guaranteed percentage but have a shortage of less than \$1 per ton.

This table, in addition to the data mentioned in the next paragraph, contains only results of analytical tests pertaining to the average amount of water insoluble nitrogen present in each brand, since this information is of value to tobacco growers and other users of fertilizers containing a high percentage of this form of nitrogen.

Potash Forms. Tests for chlorine are made only on tobacco mixtures and on those fertilizers that carry a guarantee of potash in forms other than muriate. When the amount of chlorine present in any brand exceeds the tolerance allowed for that brand, this fact is indicated by a footnote.

Mixtures Substantially Complying with Guarantees

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
American Agricultural Chemical Co.		
AA Quality Fertilizer 0-10-20.....	1	-
AA Quality Fertilizer 3-12-12.....	2	-
AA Quality Fertilizer 4-12-4.....	1	-
AA Quality Fertilizer 5-8-7.....	2	-
AA Quality Fertilizer 5-8-10, 2% magnesium oxide.....	6	-
AA Quality Fertilizer 5-10-10.....	1	-
AA Quality Fertilizer 6-8-8, 2% magnesium oxide.....	13	-
AA Quality Fertilizer 7-7-7.....	1	-
AA Quality Fertilizer 8-8-8, 2% magnesium oxide.....	9	-
Agrico Phosphate & Potash 0-10-20.....	1	-
Agrico Phosphate & Potash 0-14-14.....	2	-
Agrico for Grain 3-12-6.....	2	-
Agrico for Seeding Down 3-12-12.....	2	-
Agrico for Corn 4-12-4.....	1	-
Agrico for New England 5-8-7.....	2	-
Agrico Rose Food 5-9-6.....	1	1.83
Agrico for Gardens 5-10-5.....	1	-
Agrico for Onions 5-10-5.....	2	-
Agrico for Truck 5-10-5.....	1	-
Agrico for Potatoes 5-10-10, 2% magnesium oxide.....	4	-
Agrico for Tobacco 6-3-6.....	4 ^a	2.66
Agrico for Turf 6-8-2.....	1	2.46
Agrico for Broadleaf Evergreens 6-10-4.....	1	.75
Agrico Country Club 6-10-4.....	1	1.52
Agrico for Lawns, Trees & Shrubs 6-10-4.....	1	.72
Agrico for Top Dressing 7-7-7.....	4	-
Agrico Country Club 8-6-2.....	1	1.63
Apothecaries Hall Co.		
Green Gro Rose Food 5-7-6.....	1	.86
Green Gro Home Garden 5-8-7.....	1	-
Green Gro Fertilizer Mixture 6-7-4.....	1	-
Green Gro 3-Way-3 Lawn Dressing 6-10-4.....	1	-
Liberty Fertilizer 0-10-20.....	1	-
Liberty Fertilizer 4-12-4.....	1	-
Liberty Fertilizer 5-8-7.....	3	-
Liberty High Grade Market Garden 5-8-7, 2% magnesium oxide..	1	-
Liberty Fertilizer 5-10-5.....	2	-
Liberty 5-10-10.....	2	-
Liberty 5-10-10, 2% magnesium oxide.....	2	-
Liberty Tobacco Mixture 6-3-6.....	3 ^a	2.93
Liberty Special for Fruit and Grass 7-7-7.....	3	-
Armour Fertilizer Works		
Armour's Big Crop 0-14-14.....	1	-
Armour's Big Crop 5-8-7.....	2	-
Armour's Big Crop 5-10-5.....	1	-
Armour's Big Crop 5-10-10.....	2	-
Armour's Big Crop 5-10-10, 2% magnesium oxide.....	1	-
Armour's Big Crop Tobacco Special 6-3-6.....	2 ^a	2.41
Armour's Big Crop 7-7-7.....	1	-
Armour's Big Crop 8-16-16.....	1	-
Armour Vertagreen Plant Food 5-10-5.....	1	-
Armour Vertagreen Plant Food 6-12-6 for Commercial Crops.....	1	-
Armour Vertagreen Plant Food 6-12-12 for Commercial Crops.....	2	-
Armour Vertagreen Plant Food 10-6-4 for Professional Use.....	1	1.12
F. A. Bartlett Tree Expert Co.		
Bartlett Green Tree Food 6-8-6.....	1	-
Joseph Breck & Sons Corp.		
Breck's Quick-Life 14-30-16.....	1	-
Brexone Garden-Gro 5-10-10, 2% magnesium oxide.....	1	-
Brexone Turf-Gro 8-6-2.....	1	.56
Carbola Chemical Co., Inc.		
CCC Triple-20 Plant Food 20-20-20.....	1	-
Consolidated Rendering Co.		
Corenco 0-10-20 Hay & Pasture Special.....	2	-
Corenco 0-14-14 Top Dresser.....	1	-
Corenco 4-12-4 Complete Manure.....	1	-
Corenco 4-12-16 Ladino Special.....	1	-
Corenco 5-5-15 Tobacco Starter.....	1	-
Corenco 5-8-7 Potato & General Crop.....	2	-
Corenco 5-8-10, 2% magnesium oxide.....	1	-

^a Potash in forms other than muriate

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Consolidated Rendering Co., (Cont.)		
Corenco Home Garden 5-10-5	1	—
Corenco 5-10-5 Onion Special — Super Truck	1	—
Corenco 5-10-10 Peerless Potato	2	—
Corenco 5-10-10, 2% soluble magnesium oxide	1	—
Corenco 6-3-6 Premium Tobacco Grower	1 a	2.29
Corenco 6-3-6 Special Tobacco Grower	1 a	3.37
Corenco 6-8-8, 2% magnesium oxide	4	—
Corenco 7-7-7 Complete Fruit & Top Dressing	2	—
Corenco 8-6-4 Landscape	1	.74
Corenco 8-8-8, 2% magnesium oxide	5	—
Corenco 8-12-16, 1.5% magnesium oxide	1	—
Corenco 8-16-16 Two-in-One	1	—
Davison Chemical Corp.		
0-14-14 Davco Granulated Fertilizer	1	—
3-12-6 Davco Granulated Fertilizer	1	—
5-8-7 Davco Granulated Fertilizer	1	—
5-10-5 Davco Granulated Fertilizer	1	—
5-10-5 Davco Granulated Turf & Garden Food (Premium)	1	—
5-10-10 Davco Granulated Fertilizer	1	—
5-10-10 Davco Granulated Potato Food with 2% magnesium oxide (Premium)	1	—
7-7-7 Davco Granulated Fertilizer	1	—
10-10-10 Davco Granulated Fertilizer	1	—
Doggett-Pfeil Co.		
D & P Rose Food 5-8-3 (b)	1	2.59
Eastern States Farmers' Exchange, Inc.		
Eastern States 0-15-30	2	—
Eastern States 0-19-19 (b)	1	—
Eastern States 0-20-20	2	—
Eastern States 5-10-10, 1% magnesium oxide	2	—
Eastern States 5-15-15, 1% magnesium oxide	2	—
Eastern States 6-4-6 Tobacco, 2% magnesium oxide	1 a	1.79
Eastern States 8-4-8 Tobacco, 2% magnesium oxide	1 a	3.33
Eastern States 8-12-12, 2% magnesium oxide	1	—
Eastern States 8-12-12 L. C., 2% magnesium oxide	2 a	—
Eastern States 8-12-16, 2% magnesium oxide	1	—
Eastern States 8-16-8, 1% magnesium oxide	1	—
Eastern States 8-16-16, 1% magnesium oxide	2	—
Eastern States 10-10-10, 1% magnesium oxide	1	—
Eastern States Plant Starter 10-52-17	1	—
Essex County Cooperative Farming Association		
S-X Brand 5-8-7	1	—
S-X Brand 5-10-10	1	—
S-X Brand 5-10-10, 2% soluble magnesium oxide	1	—
S-X Brand 7-7-7	1	—
Faesy & Besthoff, Inc.		
F & B High Organic Pelletized All Purpose 6-12-6	1	1.63
Farm Bureau Association		
Farm Bureau 0-12-24	1	—
Farm Bureau 5-8-7, 1% magnesium oxide	1	—
Farm Bureau 5-10-10, 2% magnesium oxide	1	—
Farm Bureau 7-7-7, 1% magnesium oxide	1	—
Farm Bureau 8-6-2	1	1.03
Farm Bureau 8-16-16	1	—
Fox Point Chemical Co.		
Old Fox Brand 5-8-7, 2% magnesium oxide	1	—
Old Fox Brand 5-10-10, 2% magnesium oxide	2	—
Old Fox Brand 7-7-7, 2% magnesium oxide	1	—
Old Fox Brand 8-6-2	1	1.35
Frank's Market Garden		
For More Growth FMG .9-9-9	1	—
Frost & Higgins Co.		
Special Tree and Shrub Food 8-6-4	1	.72

a Potash in forms other than muriate

b Stock carried over from previous season

Mixtures Substantially Complying with Guarantees—Continued

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Goulard & Oleno, Inc.		
G & O Tomato Food 3-12-13.....	1	—
G & O Rhodo, Azalea, Camellia Food 3-20-3	1	—
G & O Rose Food 7-8-5.....	1	1.32
C. L. Halvorson Tree Service		
Halvorson Tree Food 8-6-2.....	1	1.71
Heeman Manufacturing Co.		
Lawn Bilder 8-8-4 (b).....	1	—
A. H. Hoffman, Inc.		
Hoffman Rose Food 5-10-5.....	1	—
Hydroponic Chemical Co., Inc.		
Hyponex 7-6-19.....	1	—
Hy-Trous Corp.		
Hy-Trous 4-8-4.....	1	—
International Minerals & Chemical Corp.		
International 0-10-20.....	1	—
International 0-12-24.....	1	—
International 0-14-14.....	1	—
International 0-15-30.....	1	—
International 4-12-16, 1% magnesium oxide.....	2	—
International 5-8-7, 1% magnesium oxide.....	3	—
International 5-8-10, 2% magnesium oxide.....	12	—
International 5-10-5, 1% magnesium oxide.....	2	—
International 5-10-10, 1% magnesium oxide.....	2	—
International 5-10-10, 2% magnesium oxide.....	2	—
International 6-12-12, 2% magnesium oxide.....	1	—
International 7-7-7, 1% magnesium oxide.....	2	—
International 8-6-2, 1% magnesium oxide.....	2	—
International 8-8-8.....	1	—
International 8-16-16.....	1	—
International 10-10-10, 1% magnesium oxide.....	1	—
Lexington Gardens, Inc.		
Luxuro Plant Food 5-10-3.....	1	—
Old Deerfield Fertilizer Co., Inc.		
Old Deerfield 0-12-24.....	1	—
Old Deerfield 0-14-14.....	1	—
Old Deerfield 0-20-20.....	1	—
Old Deerfield 4-12-8.....	1	—
Old Deerfield 5-5-15 Tobacco Starter.....	1 a	—
Old Deerfield 5-8-7 All Crop Fertilizer.....	2	—
Old Deerfield 5-8-7, 2% magnesium oxide, potash other than muriate.....	1 a	—
Old Deerfield 5-10-5 Trucker's Special.....	1	—
Old Deerfield 5-10-10 Potato Fertilizer.....	2	—
Old Deerfield 5-10-10, 2% magnesium oxide, potash other than muriate.....	2 a	—
Old Deerfield 6-3-6 Complete Tobacco Fertilizer.....	8 a	3.46
Old Deerfield 6-4-7 Complete Tobacco Fertilizer.....	1 a	3.23
Old Deerfield Lawnshrub 6-5-5.....	1	1.16
Old Deerfield 6-8-8 Special Potato Fertilizer.....	1	—
Old Deerfield 7-7-7 Grass Top Dressing.....	2	—
Old Deerfield 8-8-8.....	1	—
Old Deerfield 8-16-16.....	1	—
Olds & Whipple, Inc.		
O & W 5-3-5 Complete Tobacco, Potash from Cotton Hull Ash.....	1 a	2.71
O & W 5-8-7 Potato & General Purpose.....	1	—
O & W 5-10-5.....	1	—
O & W 5-10-5, 2% magnesium oxide.....	1	—
O & W 5-10-10 Potato.....	1	—
O & W 5-10-10 Potato, 2% magnesium oxide.....	1	—
O & W 6-3-6 Blue Label Tobacco, Potash from Cotton Hull Ash.....	2 a	3.22
O & W 6-3-6 Pomace Base, Potash from Cotton Hull Ash.....	1 a	2.79
O & W 7-7-7 Top Dressing & Grass.....	1	—

a Potash in forms other than muriate.

b Stock carried over from previous season

Mixtures Substantially Complying with Guarantees—Concluded

Name of Manufacturer and Brand	Number of Samples Analyzed	Average Percentage of Water Insoluble Nitrogen
Plantabbs Corp.		
Fulton's Plantabbs 11-15-20.	1	—
Ra-Pid-Gro Corp.		
Ra-Pid-Gro 23-21-17.	1	—
Rogers & Hubbard Co.		
Hubbard Dairy Fertilizer 0-10-20.	1	—
Hubbard Alfalfa Fertilizer 0-14-14.	1	—
Hubbard Corn Fertilizer 4-12-4.	1	—
Hubbard Potato Fertilizer 5-8-7.	1	—
Hubbard Vegetable Fertilizer 5-8-7.	2	—
Hubbard Vegetable Fertilizer 5-8-7, 2% magnesium oxide.	1	—
Hubbard General Crop Fertilizer 5-10-10.	1	—
Hubbard High Potash Fertilizer 5-10-10.	1	1.17
Hubbard Tobacco Grower 6-3-6.	1 <i>a</i>	3.31
Hubbard Valley Brand 6-3-6.	1 <i>a</i>	2.70
Hubbard 6-8-8 for Potatoes.	1	—
Hubbard Top Dressing 7-7-7.	2	—
Hubbard Top Dressing 7-7-7, 3% magnesium oxide.	1	—
Hubbard Double Strength Fertilizer 8-16-16.	1	—
Rose Manufacturing Co.		
Triogen Rose Food 5-10-5.	1	—
O. M. Scott & Sons Co.		
Scotts Weed & Feed 7-11-5.	1	3.34
Scotts Turf Builder 9-7-4.	1	2.18
Sears, Roebuck & Co.		
Cross Country Bulb Food 4-12-8.	1	1.47
Cross Country Evergreen Food 5-10-5.	1	—
Cross Country Lawn Food & Weed Killer 5-10-5.	1	—
Cross Country Plant Food 5-10-5.	1	—
Cross Country Rose Food 5-10-5.	1	—
Cross Country Liquid Plant Food 10-5-5.	1	—
M. L. Shoemaker Division of Wilson & Co., Inc.		
M. L. Shoemaker's "Swift Sure" 4-10-0.	1	—
Smith Agricultural Chemical Co.		
Sacco Plant Food 4-12-4.	1	—
Wedo, with 2, 4-D 6-10-4.	1	—
Stimulant Laboratories Co.		
Stim-U-Plant Plant Food Tablets 11-12-15.	1	—
Swift & Co. Plant Food Division		
All Organic Lawn Food 5-3-0.	1	4.48
Blenn 5-10-5.	1	—
Brimm 5-10-10.	1	—
Red Steer 0-14-14.	1	—
Red Steer 4-12-4.	1	—
Red Steer 5-8-7.	1	—
Vigoro 5-10-5.	1	—
Universal Chemical Co.		
Electra Plant Food 5-10-3.	1	—
C. P. Washburn Co.		
Washburn's 5-8-7.	1	—
Washburn's 5-10-10.	1	—
Washburn's 7-7-7.	1	—
Woodruff Fertilizer Works, Inc.		
Woodruff's 5-8-7.	1	—

a Potash in forms other than muriate.

NITROGEN COMPOUNDS

Manufacturer and Brand	Nitrogen	
	Found	Guaranteed
American Agricultural Chemical Co.		
Agrinite.....	8.25	8.25
Castor Pomace.....	4.88	4.25
American Cyanamid Co.		
Aero Cyanamid Granular 20%.....	{ 20.38 20.10	20.00 20.00
Aero Cyanamid Special Grade 21%.....	{ 22.05 22.29	21.00 21.00
Aeroprills Ammonium Nitrate.....	{ 33.81 33.78 34.82 34.76 34.67 34.49 34.43 34.31	33.50 33.50 33.50 33.50 33.50 33.50 33.50 33.50
Ashcraft-Wilkinson Co.		
Cow-Eta Brand 41% Protein Cottonseed Meal.....	6.45	6.56
Barrett Division, Allied Chemical & Dye Corp.		
A-N-L Fertilizer Compound.....	20.28	20.50
Arcadian the American Nitrate of Soda.....	16.00	16.00
Central Chemical Corp.		
Farmrite Sulphate of Ammonia.....	20.71	20.50
Chilean Nitrate Sales Corp.		
Chilean Nitrate of Soda—Champion Brand.....	{ 16.01 16.01	16.00 16.00
E. I. du Pont de Nemours & Co.		
Du Pont Nu Green Fertilizer Compound.....	44.00	44.00
Eastern States Farmers' Exchange, Inc.		
Sulphate of Ammonia.....	20.83	20.50
Fox Point Chemical Co.		
Old Fox Brand Sulphate of Ammonia.....	20.69	20.50
Horn & Supply Co., Inc.		
Steamed Horn & Hoof Meal.....	14.00	14.00
Humphreys-Godwin Co.		
Dixie Brand 41% Protein Cottonseed Meal.....	6.56	6.56
Old Deerfield Fertilizer Co., Inc.		
Sulphate of Ammonia.....	20.76	20.50
Sears, Roebuck & Co.		
Cross Country Sulphate of Ammonia.....	20.48	20.00
Synthetic Nitrogen Products Corp.		
Cal-Nitro Fertilizer Compound.....	20.11	20.50

Brand Showing Commercial Shortage of More Than \$1 per Ton

International Minerals & Chemical Corp.		
41% Protein Cottonseed Meal.....	6.31*	6.56

* Commercial shortage, \$3.81 per ton.

PRODUCTS SUPPLYING NITROGEN AND PHOSPHORIC ACID

Manufacturer and Brand	Nitrogen		Total Phosphoric Acid	
	Found	Guaranteed	Found	Guaranteed
Armour Fertilizer Works				
Armour's Bone Meal.....	2.64	2.30	24.58	23.00
Central Chemical Corp.				
Farmrite Bone Meal.....	2.70	2.30	27.23	20.00
Consolidated Rendering Co.				
Corenco Ground Bone (a).....	1.79	1.50	30.65	27.00
Corenco Special Ground Bone.....	3.42	3.70	22.19	20.00
Faesy & Besthoff, Inc.				
Pure Bone Meal.....	2.70	2.47	27.18	23.00
A. H. Hoffman, Inc.				
Hoffman Bone Meal (Raw).....	3.99	3.70	23.26	20.00
International Minerals & Chemical Corp.				
International Bone Meal.....	2.53	2.47	25.25	23.00
Old Deerfield Fertilizer Co., Inc.				
Old Deerfield Dry Ground Fish.....	9.61	9.00	7.63	5.00
John Reardon & Sons Division of Wilson & Co., Inc.				
Rearco Ground Bone.....	1.63	1.50	29.27	23.00
Rogers & Hubbard Co.				
Gro-Fast Bone Meal.....	3.25	2.00	27.13	23.00
Sears, Roebuck & Co.				
Cross Country Bone Meal.....	2.23	2.00	27.03	20.00
Sewerage Commission of the City of Milwaukee				
Milorganite (b).....	5.83	6.00	3.52	-
Milorganite (c).....	6.03	6.00	3.98	-

Brand Showing Commercial Shortage of More Than \$1 per Ton

Apothecaries Hall Co.				
Green-Gro Raw Bone Meal (d).....	4.53	3.70	15.35	20.00
Consolidated Rendering Co.				
Corenco Ground Bone (e).....	3.20	1.50	21.30	27.00
N. Roy & Son				
Animal Tankage (f).....	5.27	7.00	18.97	8.00

a One other sample showed a commercial shortage.

b Available phosphoric acid found, 3.06%; guaranteed, 2%.

c Available phosphoric acid found, 2.60%; guaranteed, 2%.

d Since this material is sold in small packages, a calculation of the shortage per ton is not feasible. Deficiency found is great enough for inclusion of this material with seriously deficient brands.

e Commercial shortage, \$15.39 per ton. One other sample complied with guarantee.

f Commercial shortage, \$15.57 per ton.

PHOSPHORIC ACID COMPOUNDS

Manufacturer and Brand	Total Phosphoric Acid	Available Phosphoric Acid	
		Found	Guaranteed
American Agricultural Chemical Co.			
AA Quality Phosphate Rock.....	31.82 ^a	—	—
18% Normal Superphosphate.....	{ 18.93	18.05	18.00
	{ 20.05	19.03	18.00
	{ 18.87	18.29	18.00
Armour Fertilizer Works			
Armour's Big Crop Superphosphate 20%.....	20.86	20.26	20.00
Consolidated Rendering Co.			
Coreco Superphosphate 20%.....	21.68 ^b	21.42	20.00
Davison Chemical Corp.			
Davco Granulated 20% Superphosphate.....	22.19	21.09	20.00
Eastern States Farmers' Exchange, Inc.			
Eastern States Superphosphate 20%.....	23.42	22.14	20.00
Farm Bureau Association			
Farm Bureau Superphosphate 20%.....	21.11	20.83	20.00
Fox Point Chemical Co.			
Old Fox Brand Superphosphate 20%.....	20.45	20.31	20.00
International Minerals & Chemical Corp.			
International Superphosphate 20%.....	{ 20.81	20.61	20.00
	{ 21.17	21.07	20.00
Old Deerfield Fertilizer Co., Inc.			
Old Deerfield Superphosphate 20%.....	21.42	21.14	20.00
Rogers & Hubbard Co.			
Hubbard Superphosphate 20%.....	20.91	20.79	20.00
Ruhm Phosphate & Chemical Co.			
Red Seal Brand "Ruhm's" Phosphate Rock.....	31.31 ^a	—	—

^a Guaranteed 30% total phosphoric acid.

^b Composite of 6 samples.

POTASH COMPOUNDS

Muriate of Potash

Manufacturer	Water Soluble Potash	
	Found	Guaranteed
American Agricultural Chemical Co.....	58.06	58.00
Consolidated Rendering Co.....	61.45	60.00
Davison Chemical Corp.....	50.05	50.00
Eastern States Farmers' Exchange, Inc.....	61.04	60.00
International Minerals & Chemical Corp.....	{ 60.86	60.00
	{ 60.82	60.00
Old Deerfield Fertilizer Co., Inc.....	60.50	60.00

PULVERIZED ANIMAL MANURES

Manufacturer and Brand	Total Nitrogen	Total Phosphoric Acid	Water Soluble Potash
Apothecaries Hall Co.			
Green Gro Sheep Manure (1-.25-1).....	1.44	1.33	3.35
Armour Fertilizer Works			
Armour's Pulverized Sheep Manure (1.5-1-2).....	1.50	1.10	3.18
Atkins & Durbrow, Inc.			
A&D Driconure (2-1-1).....	2.77	3.26	1.97
Central Chemical Corp.			
Farmrite Cow Manure (2-1-1).....	2.00	1.63	2.71
Farmrite Sheep Manure (2-1-1).....	2.32	1.31	1.49
Consolidated Rendering Co.			
Corenco Sputz-On (3.5-3.5-1.5).....	4.90	3.72	2.27
Corenco Sheep Manure (2-1-2).....	2.13	1.79	2.06
Davison Chemical Corp.			
Sheep Manure (2-1-2).....	1.34	1.07	2.99
A. H. Hoffman, Inc.			
Hoffman Cow Manure (2-1-1).....	2.00	2.02	2.14
Hoffman Sheep Manure (1.5-1-2).....	1.58	1.22	4.42
International Minerals & Chemical Corp.			
International Sheep Manure (\$1.25-1-2).....	2.77	3.70	2.67
Premier Peat Moss Corp.			
Premier-Nure (2-1-1).....	2.20	1.82	1.00
Rogers & Hubbard Co.			
Gro-Fast Cow Manure (2-1-1).....	2.13	1.48	1.00
Gro-Fast Sheep Manure (1.25-1-2).....	1.37	1.10	3.18
Sears, Roebuck & Co.			
Cross Country Cattle Manure (1.5-.75-2).....	1.96	1.31	2.77
Cross Country Sheep Manure (1.5-.75-2).....	1.84	1.38	1.74
Wendell S. Still			
Farmanure (2-1-1).....	3.82	3.32	2.07
	3.35	3.06	2.28
Swift & Co. Plant Food Division			
Swift's Pulverized Sheep Manure (2-1-2).....	2.00	1.43	3.32
Walker-Gordon Laboratory Co.			
Bovung (2-1-1).....	2.13	1.68	2.29

Brand Seriously Deficient

Edward J. Cole			
*Meadow Brand Sheep Manure (1.5-1.5-3).....	1.50	.40	2.50

* Seriously deficient in phosphoric acid and potash. Sample is mainly combings from wool.

AGRICULTURAL LIME PRODUCTS

Explanation of Table of Analyses

"Neutralizing value expressed in terms of calcium oxide" represents the acid neutralizing value of both the magnesium and the calcium. The figures in the "percent" column are obtained by a direct titration with standard acid. The "pounds in one ton" are secured by multiplying the figures in the "percent" column by 20.

"Insoluble matter" represents material that is insoluble in dilute hydrochloric acid to which a few drops of nitric acid have been added, and is mainly sand.

Under "Mechanical Analysis" the figures represent the percentage of product that would pass or be retained by the meshed sieves mentioned.

Agricultural Lime Products

Manufacturer and Brand	Calcium Oxide (CaO)		Magnesium Oxide (MgO)		Neutralizing Value Expressed in Terms of Calcium Oxide		Insoluble Matter		Mechanical Analysis (Per Cent)	
	Found	Guaranteed	Found	Guaranteed	Per Cent	Pounds in One Ton	Finer than 100-mesh	Coarser than 20-mesh		
Central Chemical Corp.										
Farmrite Hydrated Lime.....	65.7	72	.9	.75	66.9	1338	1.0	—	—	—
Conklin Limestone Co., Inc., Canaan, Conn.										
High Magnesium Agricultural Ground Limestone.....	31.8	30	13.5	18.0	48.7	974	17.0	63.9	1.2	1.2
Hoosac Valley Lime Co., Inc.										
Hoosac Agricultural Limestone.....	52.1	54	1.1	.5	53.4	1068	1.9	96.1	none	none
Lee Lime Corp.										
Lee Double Strength Agricultural Hydrated Lime.....	{49.6	45	31.1	30.0	89.4	1788	1.3	—	—	—
	{45.2	45	33.0	30.0	89.2	1784	1.5	—	—	—
	{29.3	30	22.2	20.0	57.6	1152	3.1	54.8	1.2	1.2
Lee Pulverized Limestone.....	{39.4	35	28.2	25.0	76.0	1520	1.4	—	—	—
Tobey Agra Hydrate.....	{39.0	35	28.4	25.0	76.7	1534	1.1	—	—	—
New England Lime Co.										
Nelco Agricultural Hydrated Lime (Adams).....	69.8	70	1.3	.5	72.9	1458	1.1	—	—	—
Nelco Agricultural Hydrated Lime (Canaan, Conn.).....	45.7	47	32.6	31.0	87.0	1758	1.9	—	—	—
Nelco Agricultural Limestone (Adams).....	51.7	53.5	1.1	.4	53.0	1060	3.6	74.5	2.0	2.0
Nelco Agricultural Ground Limestone (Canaan, Conn.).....	29.8	30	22.1	21.0	58.0	1160	4.4	83.9	none	none
Nelco Land Lime (Canaan, Conn.).....	39.9	35	27.7	25.0	76.6	1532	2.4	—	—	—
United States Gypsum Co.										
Rec Top Hydrated Agricultural Lime.....	68.4	70	3.3	trace	72.9	1458	1.9	—	—	—
USG Agricultural Limestone.....	50.1	50.5	1.5	.25	52.0	1040	7.9	77.3	—	—

DIRECTORY OF MANUFACTURERS WHO REGISTERED FERTILIZERS FOR SALE IN MASSACHUSETTS IN 1952

American Agricultural Chemical Co., 285 River St., North Weymouth 91, Mass.
 American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
 American Liquid Fertilizer Co., Inc., 2nd St., at St. Clair, Marietta, Ohio
 Apothecaries Hall Co., 28 Benedict St., Waterbury 20, Conn.
 Archer-Daniels-Midland Co., 600 Roanoke Bldg., Minneapolis 2, Minn.
 Armour Fertilizer Works, 120 Broadway, New York 5, N. Y.
 Ashcraft-Wilkinson Co., Atlanta 3, Ga.
 Atkins & Durbrow, Inc., 165 John St., New York 38, N. Y.

Barrett Division, Allied Chemical & Dye Corporation, 40 Rector St., New York 6, N. Y.
 F. A. Bartlett Tree Expert Co., 60 Canal St., Stamford, Conn.
 Joseph Breck & Sons Corporation, 401 Summer St., Boston 10, Mass.
 Buell Fertilizer Co., Exeter, N. H.

California Spray-Chemical Corporation, Lucas and Ortho Way, Richmond, Cal.
 Carbola Chemical Co., Inc., Natural Bridge, N. Y.
 Central Chemical Corporation, Lebanon, Penn.
 Chilean Nitrate Sales Corporation, 120 Broadway, New York 5, N. Y.
 Consolidated Rendering Co., 178 Atlantic Ave., Boston 10, Mass.
 Edward J. Cote, Route 3, Tyngsboro, Mass.

Davey Tree Expert Co., 117 South Water St., Kent, Ohio
 Davison Chemical Corporation, Baltimore 3, Md.
 Doggett-Preil Co., 642 Morris Turnpike, Springfield, N. J.
 E. I. du Pont de Nemours & Co., Wilmington, Del.

Eastern States Farmers' Exchange, Inc., 26 Central St., West Springfield, Mass.
 Essex County Cooperative Farming Association, Topsfield, Mass.
 Excell Laboratories, Inc., 2732 Indiana Ave., Chicago, Ill.

Faesy & Besthoff, Inc., 325 Spring St., New York 13, N. Y.
 Farm Bureau Association, 155 Lexington St., Waltham, Mass.
 Ford Motor Co., 3000 Schaefer Rd., Dearborn, Mich.
 Fox Point Chemical Co., 49 Valley St., East Providence, R. I.
 Frank's Market Garden, 1398 Allen St., Springfield, Mass.
 Frost & Higgins Co., 200 Mill St., Arlington 74, Mass.

Garfield Williamson, Inc., 1072 Westside Ave., Jersey City, N. J.
 Goulard & Olena, Inc., Skillman, N. J.

C. L. Halvorson Tree Service, 150 North St., Pittsfield, Mass.
 A. H. Hoffman, Inc., Landisville, Penn.
 Hoover Soil Service, Gilman, Ill.
 Horn & Supply Co., Inc., 190 Central St., Leominster, Mass.
 Humphreys-Godwin Co., 2246 Park Ave., Memphis, Tenn.
 Hydroponic Chemical Co., Inc., Copley, Ohio
 Hy-Trous Corporation, 50 Cross St., Winchester, Mass.

International Minerals & Chemical Corporation, Woburn, Mass.

David H. Jehu, Park St., East, North Reading, Mass.

Spencer Kellogg & Sons, Inc., 98 Delaware Ave., Buffalo 5, N. Y.

Lexington Gardens, Inc., 93 Hancock St., Lexington, Mass.

McCormick & Co., Inc., McCormick Bldg., Baltimore 2, Md.
 Mamlon Co., 1089 Whalley Ave., New Haven 15, Conn.

Natural Plant Food Co., 210 West California St., Oklahoma City, Okla.

Old Deerfield Fertilizer Co., Inc., South Deerfield, Mass.
 Olds & Whipple, Inc., 168 State St., Hartford, Conn.

F. G. Phillips Co., 255 Cedar St., Dedham, Mass.
 Plant Magic Products, Inc., 194 Wayland Ave., Providence, R. I.
 Plantabbs Corp., 1105 Maryland Ave., Baltimore 1, Md.
 Premier Peat Moss Corp., 535 Fifth Ave., New York 17, N. Y.
 Pulverized Manure Co., 503 Exchange Bldg., Chicago 9, Ill.

Ra-Pid-Gro Corporation, 88 Ossian St., Danville, N. Y.
 John Reardon & Sons Division of Wilson & Co., Inc., 51 Waverly St., Cambridge 39, Mass.
 Rogers & Hubbard Co., Portland, Conn.
 Rose Manufacturing Co., 6 Main St., Beacon, N. Y.
 N. Roy & Son, South Attleboro, Mass.
 Ruhm Phosphate & Chemical Co., 8 South Michigan Ave., Chicago 3, Ill.

O. M. Scott & Sons Co., Marysville, Ohio

Sears, Roebuck & Co., 925 South Homan Ave., Chicago 7, Ill.
Sewerage Commission of the City of Milwaukee, Milwaukee 1, Wis.
M. L. Shoemaker Division of Wilson & Co., Inc., Delaware Ave. and Venango St., Philadelphia 34, Penn.
Smith Agricultural Chemical Co., 618 North Champion Ave., Columbus 16, Ohio
Wendell S. Still, Middle Country Rd., Selden, N. Y.
Stimulant Laboratories Co., 791 South Lazelle St., Columbus, Ohio
Stockdale Fertilizer Co., Morris, Ill.
Swift & Company Plant Food Division, 25 Faneuil Hall Sq., Boston 9, Mass.
Synthetic Nitrogen Products Corporation, 285 Madison Ave., New York 17, N. Y.

Tennessee Corporation, Lockland, Cincinnati 15, Ohio
Tennessee Corporation, 619-27 Grant Bldg., Atlanta, Ga.
Thomson Phosphate Department, International Minerals & Chemical Corporation, 407 South Dearborn St., Chicago 5, Ill.

Universal Chemical Co., 106 Ontario St., Lynn, Mass.
Walker-Gordon Laboratory Co., Plainsboro, N. J.
C. P. Washburn Co., Middleboro, Mass.
Woodruff Fertilizer Works, Inc., North Haven, Conn.
F. H. Woodruff & Sons, Inc., Milford, Conn.

DIRECTORY OF MANUFACTURERS WHO REGISTERED AGRICULTURAL LIME PRODUCTS FOR SALE IN MASSACHUSETTS IN 1952

Central Chemical Corp., Lebanon, Penn.

Conklin Limestone Co., Inc., Canaan, Conn.
Conklin Limestone Co., Inc., R.F.D., Saylesville, R. I.

A. H. Hoffman, Inc., Landisville, Penn.
Hoosac Valley Lime Co., Inc., Adams, Mass.

Kelley Island Lime & Transport Co., 1132 Leader Bldg., Cleveland 14, Ohio

Lee Lime Corp., Lee, Mass.
Limestone Products Corporation of America, 122 Main St., Newton, N. J.

New England Lime Co., Adams, Mass.

United States Gypsum Co., 300 West Adams St., Chicago 6, Ill.

Vermont Associated Lime Industries, Inc., Winooski, Vt.

MASSACHUSETTS
AGRICULTURAL EXPERIMENT STATION

CONTROL SERIES

BULLETIN NO. 155

DECEMBER 1952

Seed Inspection

BY SEED CONTROL SERVICE STAFF

This report, the twenty-fifth in seed control service, is a record of work delegated to the Massachusetts Agricultural Experiment Station during 1952 by authority of Chapter 94 as amended by Chapter 377 of the Acts of 1946.

UNIVERSITY OF MASSACHUSETTS
AMHERST, MASS.

LABORATORY REGULATIONS AND FEES FOR TESTING SEED

The following regulations and fees have been approved by the Director of the Massachusetts Agricultural Experiment Station.

FIELD CROPS:	KIND OF SEED	PURITY ONLY	GERMINATION ONLY	PURITY AND GERMINATION
Alfalfa, Rape, Ryegrasses, Soybeans, Timothy.....		\$1.00	\$0.50	\$1.25
Cereals, Buckwheat, Sudan Grass, Vetches.....		1.25	.50	1.50
Clovers, Fescues, Reed Canary Grass.....		1.00	.50	1.50
Brome Grass, Millets.....		1.50	.50	2.00
Bentgrasses, Bluegrasses, Orchard Grass, Redtop....		2.00	.50	2.25
Redtop (Unhulled).....		2.50	.50	2.75

Mixtures: Lawn, Pasture, Mowing, etc.

Purity only.....\$2.50

Germination only..... .50 for each component

Purity and Germination..... 2.50 + .50 for each component

Special Mixtures: Consisting of two kinds of cereals, two kinds of clover only, or Timothy and one kind of clover

Purity only..... \$1.25

Germination only..... .50 each

Purity and Germination..... 2.00

Vegetables: Germination tests for all kinds of vegetable seeds, 30 cents each.

Cleaning Tobacco Seed: For each lot of one pound or less, based on the weight of seed as received for cleaning, 50 cents.

Kinds of Seed Not Listed: Fees for testing and for other seed determinations not listed will be based on the time consumed in making the test or for other service requested.

Free Tests: During any one calendar year, the Seed Testing Laboratory will allow two free tests of vegetable or tobacco seed to any person residing or doing business in the Commonwealth.

The minimum weights of samples to be submitted for analysis are:

a. Two ounces of grass seed, white or alsike clover, or seeds not larger than these.

b. Five ounces of red or crimson clover, alfalfa, ryegrasses, millet, rape, or seeds of similar size.

c. One pound of cereal, vetches, or seeds of similar or larger size.

The minimum number of seeds of any kind to be submitted for a germination test is 400.

Samples should be taken so as to represent correctly the lot sampled, each placed in a strong container, the parcel of samples securely wrapped and addressed to **Seed Laboratory, Agricultural Experiment Station, Amherst, Mass.**

Checks or Money Orders must be made payable to the University of Massachusetts and sent to the Seed Laboratory.

In no case will the final report for work done be rendered until all fees are paid.

SEED INSPECTION FOR THE SEASON OF 1952

By Seed Control Service Staff:

F. A. McLaughlin, *Associate Research Professor in Charge*

Jessie L. Anderson, *Assistant Professor*
Waldo C. Lincoln, Jr., *Laboratory Assistant*
A. Warren Clapp, *State Inspector*¹

Mrs. Phyllis Russell, *Laboratory Assistant*
Hans Joa, *Laboratory Helper*
May J. Honnay, *Senior Clerk*

Massachusetts Vegetable Seed Standards for 1953

The amended seed law requires in Section 261 I that the Director of the Massachusetts Agricultural Experiment Station shall, after reasonable notice and hearing and with the approval of the Commissioner of Agriculture, adopt vegetable seed germination standards, prescribe rules and regulations, and in like manner modify or amend rules and regulations governing the methods of sampling, inspecting, analyzing, testing, and examining agricultural, vegetable and flower seeds and the tolerances to be followed in administration.

A hearing for the above stated purpose was held in Horticultural Hall, Worcester, Massachusetts, at 3 P. M., October 18, 1946. The following set of standards was so approved and adopted:

KIND OF SEED	GERMINATION STANDARD %	KIND OF SEED	GERMINATION STANDARD %
Artichoke (<i>Cynara Scolymus</i>)....	60	Kale.....	75
Asparagus.....	70*	Kohlrabi.....	75
Bean, Lima.....	70	Leek.....	60
Bean, Scarlet Runner.....	75	Lettuce.....	80
Bean, Other Varieties.....	75	Muskmelon.....	75
Beet.....	65	Mustard.....	75
Broccoli.....	75	Okra.....	*50
Brussels Sprouts.....	70	Onion.....	70
Cabbage.....	75	Parsley.....	60
Cabbage, Chinese.....	75	Parsnip.....	60
Carrot.....	55	Peas.....	80
Cauliflower.....	75	Pepper.....	55
Celeriac.....	55	Pumpkin.....	75
Celery.....	55	Radish.....	75
Chard, Swiss.....	65	Rhubarb.....	60
Chicory.....	65	Rutabaga.....	75
Citron.....	65	Salsify.....	75
Collard.....	80	Sorrel.....	60
Corn, Sweet.....	75	Soybean.....	75
Cress, Garden or Curled.....	40	Spinach, Common.....	60
Cress, Water.....	35	Spinach, New Zealand.....	40
Cucumber.....	80	Squash.....	75
Dandelion.....	45	Tomato.....	75
Egg Plant.....	60	Tomato, Husk.....	50
Endive.....	70	Turnip.....	80
Fetticus (Corn Salad).....	70	Watermelon.....	70

*Including Hard Seeds. However, the percentage of germination, exclusive of hard seeds and the percentage of hard seed, if present, must be stated.

¹Employed by the State Department of Agriculture

1952 OFFICIAL INSPECTION OF AGRICULTURAL SEEDS

From November 1, 1951, to November 1, 1952, the Seed Laboratory received 6064 samples of seed, of which 1322 were collected by the State Department of Agriculture and 4742 were sent in by seedsmen, farmers, and various State institutions.

Classification of the samples for which tests were completed, with the total number of laboratory tests involved, is shown in the following summary. It will be noted that the total number of tests required for the 6064 samples was 430 for purity and 6677 for germination.

NUMBER OF SAMPLES	NUMBER OF TESTS	
	PURITY	GERMINATION
302 Field Crops for Purity and Germination.....	302	302
480 Field Crops for Germination Only.....	.....	480
107 Lawn Mixtures and Other Types of Mixtures, for Purity; Germinations involving 438 ingredients	107	438
103 Lawn Mixtures for Germination Only; Germinations involving 406 ingredients.....	.....	406
21 Lawn Mixtures for Purity Only.....	21	.....
4559 Vegetables for Germination Only.....	.....	4559
14 Tree Seeds for Germination Only.....	.....	14
100 Tobacco Seeds for Germination Only.....	.....	100
354 Flower Seeds for Germination Only.....	.....	354
24 Weed Seeds for Germination.....	.....	24
<hr/> 6064	<hr/> 430	<hr/> 6677

Field tests to determine trueness to type consist of 301 samples of vegetable seeds and 339 samples of flower seeds, respectively. These tests were supervised by the departments of Olericulture and Floriculture,

The Seed Laboratory cleaned 67 lots of tobacco seed for Connecticut Valley farmers. The gross weight of the tobacco seeds was 63.82 pounds, and the net weight for the cleaned seed was 52.75 pounds.

Explanation of Tables

Tables 1 through 5 consist of data in conformity with requirements of the Seed Law defined by Chapter 94 as amended by Chapter 377 of the Acts of 1946:

- Table 1. Results of Inspection and Analyses of Field Seeds as defined under Sections 261 B1 and 261 C.
- Table 2. Results of Inspection and Analyses of Mixtures of Agricultural Seeds as defined under Sections 261 B1 and 261 C.
- Table 3. Results of Inspection and Germination of Vegetable Seeds as defined under Sections 261 B2 and 261 C.
- Table 4. Field Tests of Vegetable Seeds, Type and Variety Studies, as defined under Sections 261 H.
- Table 5. Studies of Flower Seeds, Laboratory and Field Tests to Determine Quality, as defined under Sections 261 H.
- Table 6. Summary, by wholesalers, of the total number of samples tested, showing how many were correctly labeled and how many were mislabeled.

All samples were taken by an inspector from the State Department of Agriculture and were tested at the Seed Laboratory according to the Rules for Seed Testing adopted by the Association of Official Seed Analysts.

Within each table the wholesalers are listed in alphabetical order, and the various kinds of seeds sold by them follow the same alphabetical arrangement. Mislabeled and other irregularities are emphasized by boldface type and explained in the final column of the table. The number preceding each analysis is for identification and reference. The line to the right of the letter "L" gives information copied from the label; that to the right of "F," what was found in the laboratory analysis.

Results of Inspection and Analyses of Field Seeds—Sections 261 B1 and 261 C.

Each lot of Agricultural Seeds except Barley, Buckwheat, Oats, Rye, and Wheat, must be labeled to show the commonly accepted name and variety. When the variety is unknown, the label shall bear the statement: "Variety Unknown." The label must also show lot number or other identification; percentage, by weight, of pure seed; percentage, by weight, of inert matter; percentage, by weight, of weed seeds; percentage, by weight, of other agricultural seeds; percentage of (a) germination, exclusive of hard seeds; (b) hard seeds, if present; month and year germination test was completed; origin of Alfalfa, Red Clover, and Field Corn (other than Hybrid)—if origin is unknown, it must be so stated; name and address of the person who labeled the seed, or who sells, offers, or exposes such seed for sale; and the names of secondary noxious weed seeds and number per ounce when present singly or collectively in excess of 1 in 5 grams and 1 in 10 grams of the smaller seeds, and per pound when present in excess of 1 in 25 grams and 1 in 100 grams of the larger seeds. Secondary noxious weeds are dodder (*Cuscuta spp.*), horse nettle (*Solanum carolinense*), wild mustards (*Brassica spp.*), wild garlic and wild onion (*Allium spp.*), perennial sow thistle (*Sonchus arvensis*), corncockle (*Agrostemma Githago*), buckhorn plantain (*Plantago lanceolata*), and wild radish (*Raphanus Raphanistrum*). Seed is prohibited from sale for having a false or misleading label; unless the test for germination has been completed within a nine-month period or if it contains primary noxious weed seeds in excess of tolerance. Primary noxious weeds are Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), and quack grass (*Agropyron repens*).

Two hundred and fifty-four samples of field crop seeds were analyzed in the laboratory. Results of analysis, however, are given only for samples that were mislabeled. In Table 1, complete analysis is recorded; but mislabeling, indicated by boldface type, is applied only to the items named above. Wholesaler's name is in boldface type.

Table 1

Lab No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number; Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
546	Timothy	Arthur R. Cone, Inc., Buffalo, N. Y. General Mills, Inc., Farm Service Div., Fall River No. 10-997—	99.70 99.85	0.16 0.05	0.08 0.05	0.06 0.05	84.00 71.00	12/1951 6/1952	Germination below that stated.
918	Millet	General Mills, Inc., Farm Service Div., Lowell Hungarian, No. 90 x 268	99.19 97.74	0.15 0.45	0.56 1.81	0.10 0.00	75.00 56.00	2/1952 6/1952	Purity below that stated. Weed Seed excessive. Inert Matter excessive. Germination below that stated.

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
1008	Oats	Haley's Grain Store, Palmer Goldwin, No. 50 x 428.	L 99.83 F 99.85	0.02 0.04	0.10 0.02	0.05 0.09	82.00 61.00	1/1952 5/1952	Germination below that stated.
S-4	Rye	Medfield State Hospital, Medfield Winter Rosen, No. 56 x 252	L 99.05 F 99.52	0.00 0.01	0.90 0.47	0.05 0.00	75.00 20.00	7/1952 9/1952	Germination below that stated.
S-5	Rye	Sunshine Feed Store, Ayer Winter Rosen, No. 56 x 252.	L 99.05 F 99.71	0.00 0.00	0.90 0.29	0.05 0.00	75.00 41.00	7/1952 10/1952	Germination below that stated.
979	Millet	United Co-op Farmers, Inc., Fitchburg Hungarian, No. 90 x 268.	L 99.19 F 99.41	0.15 0.22	0.56 0.31	0.10 0.06	75.00 54.00	2/1952 6/1952	Germination below that stated.
1057	Millet	Weld & Beck Co., Southbridge Hungarian, No. 90 x 268.	L 99.19 F 99.34	0.15 0.09	0.56 0.57	0.10 0.00	75.00 57.00	2/1952 6/1952	Germination below that stated.
S-3	Rye	Worcester State Hospital, Worcester Winter Rosen, No. 56 x 252.	L 99.05 F 99.42	0.00 0.00	0.90 0.58	0.05 0.00	75.00 19.00	7/1952 9/1952	Germination below that stated.
1147	Timothy	Craver-Dickinson Co., Buffalo, N. Y. Bisbee Bros., Williamsburg No. 66-535.	L 99.60 F 99.34	0.10 0.22	0.15 0.33	0.15 0.11	91.00 91.00	1/1952 6/1952	Noxious weeds not declared, bul 31 Buckhorn Plantain per oz. found.
1169	Brome Grass	Eastern States Farmers Exchange, West Springfield, Mass. Eastern States Farmers Exchange, Great Barrington Smooth, No. 339.	L 91.80 F 92.26	0.06 0.09	8.09 7.50	0.05 0.15	82.00 42.00	3/1952 6/1952	Germination below that stated.
1090	Corn	Charles C. Hart Seed Co., Wetherfield, Conn. Pierce Hardware Co., Taunton Westbranch Sweepstakes, Lot No. (*). Origin (*).	L 99.00 F 99.85	0.00 0.00	1.00 0.15	0.00 0.00	85.00 76.00	2/1952 5/1952	*Required information not given. Germination below that stated.
1116	Millet	D. Landreth Seed Co., Philadelphia, Pa. Smith Mills Hardware, Inc., No. Dartmouth Barnyard, Lot No. (*).	L 99.00 F 96.49	0.00 2.25	1.00 1.26	0.00 0.00	80.00 or better 81.00	1/1952 6/1952	*Required information not given. Purity below that stated. Weed Seed excessive.

Table 1. Results of Inspection and Analyses of Field Seeds (continued)

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed, Origin and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Germination %	Date of Test	Violations
The Page Seed Co., Greene, N. Y.									
1137	Brome Grass	Weld & Beck Co., Southbridge Domestic, No. J-382852.....	L 92.00 F 93.25	0.00 0.03	8.00 6.71	0.00 0.01	90.00 75.00	2/1952 6/1952	Germination below that stated.
1263	Oats	Park & Pollard Co., Inc., Buffalo, N. Y. Farmers Feed & Supply Co., Amesbury Re-cleaned, Swedish Select Type-Variety Unknown .. Lot No. (*)	L 98.00 F 99.64	0.20 0.09	0.20 0.05	1.60 0.22	85.00 92.00	3/1952 6/1952	*Required information not given. Noxious weeds not declared, but 23 <i>Brassica Kaber</i> per lb. found. Excessive.
Wm. G. Scarlett & Co., Baltimore, Md.									
S-445	Birdsfoot Trefoil	C. H. Symmes & Co., (Scarlett Warehouse) Winchester No. 1402.....	L 98.00 F 99.40	0.50 0.24	0.90 0.08	0.60 0.28	70-15 76-6	11/1951 4/1952	Noxious weeds not declared, but 27 <i>Buckhorn Plantain</i> per oz. found.
Stanford Seed Co., Buffalo, N. Y.									
902	Buckwheat	Cutler Grain Co., Framingham Silverhill, No. 5889.....	L 99.85 F 99.87	0.04 0.01	0.11 0.10	0.00 0.02	90.00 79.00	2/1952 5/1952	Germination below that stated.
799	Clover	Ladino, No. 2491.....	L 99.62 F 99.52	0.17 0.38	0.06 0.02	0.15 0.08	78-13 62-35	12/1951 6/1951	Germination below that stated.
1231	Redtop	Wirthmore Grain Co., Attleboro No. 2043.....	L 94.37 F 93.27	0.20 0.12	5.33 6.56	0.10 0.05	85.00 70.00	1/1952 6/1952	Germination below that stated.
993	Timothy	Wirthmore Grain Co., Bridgewater No. 2200.....	L 99.60 F 99.67	0.05 0.10	0.25 0.23	0.10 0.10	90.00 90.00	2/1952 5/1952	Noxious weeds not declared, but 16 <i>Buckhorn Plantain</i> per oz. found.
S. D. Woodruff & Sons, Inc., Orange, Conn.									
1127	Corn	Farmers Co-op Exchange, Framingham Westbranch Sweepstakes, No. 15-505 Origin (*)	L 99.00 F 99.97	0.00 0.00	1.00 0.03	0.00 0.00	90.00 80.00	3/1952 5/1952	*Required information not given. Germination below that stated.
1029	Corn	W. N. Potter Grain Store, Orange Woodruff's Beauty, No. 15-507..... Origin, — Pennsylvania	L 99.00 F 99.90	0.00 0.00	1.00 0.10	0.00 0.00	90.00 79.00	11/1951 5/1952	Germination below that stated.

Results of Inspection and Analyses of Mixtures of Agricultural Seeds—Sections 261 BI and 261C.

Each mixture of Agricultural Seeds shall be labeled to show the commonly accepted name and variety of each agricultural seed component in excess of five percent of the whole and the percentage, by weight, of each in the order of its predominance. The word "mixture" or the word "mixed" shall be shown conspicuously on the label. Other label requirements for Mixtures are the same as those for Field Seeds; hence, are not repeated here since they will be found under Table 1.

Fifty-two Mixtures were received, but only 17 were found to vary sufficiently from the label requirements to justify the statement of complete analysis in this table. Items which are mislabeled, also the name and address of the wholesaler, are printed in boldface type.

Table 2

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer When Other Than Wholesale Distributor and Place Collected	Components %		Germination %		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
S-1307	Belt Seed Co., Baltimore, Md.										
	Dept. Public Works, Camp Miles Standish, Taunton										
	Plot Grass Mixture, No. 1964					L 91.47	0.50	14.30	.....	5/1952	Other Crop Seed not declared, but 2.53% found.
						F	0.73	5.27	2.53	7/1952	
	Components:										
	Chewings Fescue.....	49.80	47.54	80.00	88.00						
	Redtop.....	18.40	18.20	90.00	88.00						
Kentucky Bluegrass.....	17.00	18.73	80.00	84.00							
Domestic Ryegrass.....	.....	7.00	.....	80.00							Not declared, but 7.00% found.
S-1311	Plot Grass Mixture, No. 1978					L 91.49	0.50	14.30	.....	5/1952	Other Crop Seed not declared, but 1.25% found.
						F	0.77	7.49	1.25	7/1952	
	Components:										
	Chewings Fescue.....	49.80	48.69	80.00	81.00						
	Redtop.....	18.40	19.51	90.00	90.00						
	Kentucky Bluegrass.....	17.00	18.88	80.00	84.00						
	Domestic Ryegrass.....	6.41	92.00						

Table 2. Results of Inspection and Analyses of Mixtures of Agricultural Seeds (continued)

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer When Other Than Wholesale Distributor and Place Collected	Components %		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label Found	Found							
493	Crawford Nursery & Seed Store, Providence, R. I. Franklin Hardware Co., No. Attleboro Rapid Grow Mixture No. 7				L F				12/1951 4/1952	
	Components:									
	Perennial Ryegrass.....	19.60	17.24	90.00	96.00			0.75		
	Domestic Ryegrass.....	49.00	50.81	90.00	96.00			0.25		
	Timothy.....	20.00	22.65	85.00	91.00					
	Ky Bluegrass.....	0.95	0.80	70.00	38.00					Below that stated.
	Redtop.....	2.04	2.65	70.00	81.00					
1087	Garfield Williamson & Co., Jersey City, N. J. Richards Hardware Co., Brockton Utility Wonderlawn Mixture, No. UN-3, AMS 43				L F				3/1952 5/1952	
	Components:									
	Perennial Ryegrass.....	29.40	34.63	90.00	92.00			4.50		
	Fancy Redtop.....	27.60	28.14	90.00	89.00			0.22		
	Kentucky Bluegrass.....	12.75	12.46	80.00	58.00					Germination below that stated.
	Creeping Red Fescue.....	9.80	8.06	85.00	86.00					
	Poa Trivialis.....	9.00	8.43	85.00	87.00					
925	Chas. C. Hart Seed Co., Wethersfield, Conn. Sunshine Feed Store, Ayer Elm Tree Mixture, No. A 52				L F				2/1952 5/1952	
	Components:									
	Domestic Ryegrass.....	29.70	34.44	90.00	88.00			7.83		
	Kentucky Bluegrass.....	21.25	20.06	80.00	74.00			6.90		Other Crop Seed not declared, but .13% found.
	Fancy Redtop.....	16.30		90.00						
	Perennial Ryegrass.....	9.90	9.86	90.00	88.00					Percentage below that stated.
	Red Fescue.....	9.70	19	90.00	**					**Insufficient seeds found for a Germination test.
	Highland Bent.....	4.95		80.00	82.00					Not declared, but 10.70% found.
	Agrostis spp. (Redtop & Highland Bent)		17.21							
	Meadow Fescue.....		10.70		97.00					

Table 2. Results of Inspection and Analyses of Mixtures of Agricultural Seeds (continued)

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer When Other Than Wholesale Distributor and Place Collected	Components		Germination		Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found	Label	Found						
D. Landreth Seed Co. (continued)											
957	City Grain Co., Marlboro Landreth's Never Die Lawn Mixture, No. 210.					L F	0.69 0.60	8.86 9.83	0.27 0.41	1/1952 5/1952	
	Components:										
	Redtop	37.88		90.00							
	Kentucky Bluegrass	22.23	20.83	80.00	80.00						
	Perennial Ryegrass	19.50	19.33	95.00	96.00						
	*Bentgrass	5.17		85.00							**"Bentgrass" not sufficient. High-land Bent found.
	White Dutch Clover	5.40	6.00	73-19	80.16						
	Agrostis spp. (Redtop & Highland Bent)		43.00		86.00						
Ostberg Seed Co., Chicago, Ill.											
690	Sears, Roebuck & Co., No. Cambridge Robinhood Lawn Mixture, No. E 201.					L F	0.50 0.26	5.83 7.06	0.50 0.45	3/1952 5/1952	
	Components:										
	Domestic Ryegrass	39.60	43.36	90.00	96.00						
	Kentucky Bluegrass	25.50	17.67	75.00	61.00						
	Redtop	19.32	21.55	90.00	85.00						
	Creeping Red Fescue	6.79	7.27	90.00	92.00						
	White Clover	1.96	2.38	90.00	84-12						
The Page Seed Co., Greene, N. Y.											
750	F. X. Robichaud, Methuen Special Mixture, Emerald Green, No. L 14-951.					L F	0.15 0.35	1.77 1.56	0.34 0.22	11/1951 5/1952	
	Components:										
	*Ryegrass	63.95	68.54	90.00	90.00						**"Ryegrass" not sufficient. Domestic Ryegrass found.
	Redtop	22.97	21.46	90.00	89.00						
	Timothy	10.82	7.87	85.00	90.00						

Percentage below that stated.
Germination below that stated.

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer When Other Than Wholesale Distributor and Place Collected	Components %		Germination %	Pure Seed %	Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label	Found							
749	The Page Seed Co., Greene, N. Y. (continued) F. X. Robichaud, Methuen Special Mixture, Fastgrow, No. L 14-452.				L 98.45 F	0.02 0.63	1.00 0.92	..... .....	2/1952 5/1952	Weed Seed excessive. * "Ryegrass" not sufficient. Domestic Ryegrass found.
	Components:									
	*Ryegrass.....	81.82	80.32	90.00	94.00					
	Timothy.....	8.20	8.92	85.00	86.00					
	Meadow Fescue.....	6.20	5.44	90.00	89.00					
	Kentucky Bluegrass.....	2.76	3.77	90.00	85.00					
540	Pedigreed Seed Co., New York, N. Y. Pines Hardware Co., Fall River Century Park Lawn Mixture, No. 0301.				L 90.06 F	0.90 0.77	9.32 8.72	0.80 0.45	2/1952 4/1952	
	Components:									
	Domestic Ryegrass.....	35.26	36.06	90.00	94.00					Percentage below that stated.
	Timothy.....	24.42	25.09	85.00	82.00					Percentage exceeds that stated.
	Redtop.....	9.24	6.59	80.00	81.00					Percentage below that stated.
	Perennial Ryegrass.....	9.06	11.80	90.00	94.00					Percentage below that stated.
	Kentucky Bluegrass.....	5.56	3.80	80.00	84.00					Percentage below that stated.
	Alta Fescue.....	4.44	2.09	80.00	95.00					
	White Clover.....	1.00	0.84	80.00	72-15					Not declared but 3.79% found.
	Canada Bluegrass.....	.....	3.79	.....	90.00					
539	Marvel Green Lawn Mixture, No. N. E. 305.....				L 90.75 F	0.75 0.13	5.06 7.99	..... 1.13	2/1952 4/1952	Inert Matter excessive. Other Crop Seed not declared, but 1.13% found. Noxious Weeds not declared, but 27 Buckhorn Plantain per oz. found. Percentage less than that stated.
	Components:									
	Perennial Ryegrass.....	31.85	23.21	90.00	94.00					Percentage exceeds that stated.
	Timothy.....	31.85	34.33	90.00	89.00					
	Kentucky Bluegrass.....	21.25	17.93	80.00	83.00					
	Fancy Redtop.....	9.24	15.28	90.00	84.00					

Table 2. Results of Inspection and Analyses of Mixtures of Agricultural Seeds (concluded)

Lab. No.	Wholesale Distributor, Brand Name, Lot Number and Components of Each Mixture, Dealer When Other Than Wholesale Distributor and Place Collected	Components %		Germination %	Pure Seed %		Weed Seed %	Inert Matter %	Other Crop Seed %	Date of Test	Remarks
		Label Found	Found		Label Found	Found					
547	Philadelphia Seed Co., Philadelphia, Pa. Parkers Farm Supply Co., Danvers Old English Lawn Mixture, No. 418				L 88.74	F	0.40 0.35	9.62 10.25	0.66	1-1952 4/1952	Other Crop Seed not declared, but .66% found.
	Components:										
	Kentucky Bluegrass.....	33.10	32.66	80.00		85.00					
	Redtop.....	21.65		90.00							
	Domestic Ryegrass.....	19.80	19.17	90.00		93.60					
	*Bent.....	5.60		80.00							
	Chewings Fescue.....	4.93	4.75	80.00		86.00					
	White Clover.....	4.90	5.25	73-20		70-23					
	Agrostis spp.....		26.91			89.00					
	(Redtop — Mixed Bent)										
548	Splendorlawn Mixture, No. 419				L 88.88	F	1.00 0.56	7.12 8.62	1.94	1/1952 5/1952	Other Crop Seed not declared, but 1.94% found.
	Components:										
	Domestic Ryegrass.....	35.54	35.53	90.00		96.00					
	Timothy.....	34.30	32.77	85.00		87.00					
	Redtop.....	11.84	10.80	82.00		83.00					
	Kentucky Bluegrass.....	8.20	7.22	75.00		82.00					
	White Clover.....	2.00	2.56	73-20		70-25					
446	Wm. G. Scarlett & Co., Baltimore, Md. Wm. G. Scarlett & Co., Warehouse, Winchester Park Lawn Mixture, No. 14891				L 85.10	F	0.50 0.60	13.10 13.80	0.40 0.50	2-1952 4/1952	Noxious Weeds not declared, but .69 Buckhorn Plantain per oz. found.
	Components:										
	Domestic Ryegrass.....	44.50	39.65	90.00		83.00					
	Timothy.....	14.70	17.60	80.00		92.00					
	Meadow Fescue.....	14.50	13.50	80.00		78.00					
	Kentucky Bluegrass.....	7.80	9.65	70.00		75.00					
	Redtop.....	4.50	4.70	70.00		85.00					

Results of Inspection and Germination of Vegetable Seeds Sections 261 B2 and 261 C.

Each separate container of Vegetable Seeds must be labeled to show plainly the kind of seed and variety and the name and address of the person who labeled such seed or who sells, offers, or exposes it for sale. For seeds that germinate less than the Massachusetts Standard, the label must also show the percentage of germination exclusive of hard seeds, percentage of hard seeds if present, calendar month and year the test was completed, and the words "Below Standard" in not less than 8-point type. Date of test shall not be more than nine months old, exclusive of the month in which the test was completed. Seed that has a false or misleading label may not be sold or offered for sale.

Six hundred and seventy-one samples of vegetable seeds were received and tested in the laboratory; however, Table 3 includes only those samples that were found to be mislabeled with regard to requirements of law.

The wholesaler's name, in all instances, and the germination for those samples of seed found below standard in germination are in boldface type. In samples for which the found germination is not in boldface, the germination is above standard but below germination stated.

Table 3

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	Germination				Mass. Standard %
			Given		Found		
			%	Date of Test	%	Month of Test	
172 F	Corn	Joseph Breck & Sons, Inc., Boston, Mass. Extra Early Pearl.....	85	1, 1952	69	4 1952	75
404 F	Beans	Eastern States Farmers' Exchange, West Springfield, Mass. Eastern States Farmers' Exchange, Campello Top Crop, No. T 2211.....	80	12 1951	69	4 1952	75
1170 F	Beans	Eastern States Farmers' Exchange, Gr. Barrington Top Crop, No. T 2211.....	80	12/1951	63	5/1952	75
1016 F	Beans	Eastern States Farmer's Exchange, West Springfield Commodore, No. C 3112.....	80	1 1952	69	5 1952	75
1093	Cabbage	Chas. C. Hart Seed Co., Wethersfield, Conn. Pierce Hardware Co., Taunton Mammoth Red Rock.....	75	1 1952	56	5 1952	75
5	Lettuce	New York Head No. 12, Lot B.....	80	12 1951	43	4 1952	80
107	Pepper	J. T. O'Brien Co., Philadelphia, Pa. Frank Botelho, Somerset Early Calwonder, No. 1691.....			28	4 1952	55
111	Collard	Tri-State Seed Co., Philadelphia, Pa. Frank Botelho, Somerset Georgia.....	80	12/1951	13	4 1952	80
701 F	Radish	F. H. Woodruff & Sons, Milford, Conn. Joseph Catoni, Lexington Cavalier, No. 2-2110.....	90	10 1951	69	5/1952	75
1172	Radish	Harland B. Foster, Inc., Gr. Barrington Woodruff's Beauty, No. 2-2210.....	90	10 1951	59	5/1952	75
1114	Beans	General Mills, Inc., Middleboro Fr. Horticultural, No. 0-3192.....	80	10/1951	53	6/1952	75
35	Beans	Waldron Hardware Co., Taunton Fr. Horticultural, No. 0-1392.....	80	10, 1951	57	4/1952	75
37	Beans	Golden Top Notch, No. 0310 C.....	80	10/1951	70	4 1952	75

FIELD TESTS OF VEGETABLE SEEDS

Type and Variety Studies

Conducted by the Seed Laboratory

Waldo C. Lincoln, Jr., Laboratory Assistant

W. H. Lachman, Associate Research Professor, Consultant

Department of Olericulture

This is the seventeenth year that the Experiment Station has conducted tests to determine the trueness-to-type of various kinds of vegetable seed offered for sale in this State. The State Seed Inspector purchased 301 samples of beans, beets, broccoli, cabbage, corn, carrots, radishes, rutabagas, and turnips for trial in the field test plots in order to compare plant characteristics with the labeled variety name. The 301 samples tested were taken at 22 retail establishments and represent the products of 30 seedsmen who wholesale seed in this State. All lots, except carrots and radishes, were hand-seeded in twenty-foot rows, and later thinned to the desired distances. The carrots and radishes were hand-seeded in ten-foot rows and later thinned to the desired distances. Planting was done the 23rd of May. Although growing conditions were rather dry throughout this area, theseed plots did not suffer due to the rather heavy soil and the low location.

Conformity to type was the measure of comparison in the tests, and individual plants were called off-type when they could not be classified in a group of plants ranging fairly close to the type generally accepted as typical for the particular variety under consideration.

Table 4
Field Tests of Vegetable Seeds

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Associated Seed Gowers, Inc.				
Milford, Conn.				
597 F	Radish	De Vincent Bros., Waltham Cavalier, No. 21406.....	98	2% French Breakfast Type Poor root development
S-480 F	Rutabaga	Wrentham State School, Wrentham L. I. Improved.....	92	8% Purple Top White Globe Turnip
Joseph Breck & Sons, Boston, Mass.				
182 F	Beet	Crosby Egyptian Breck's Arlington Strain.....	70	30% Detroit Dark Red Type
172 F	Corn	Extra Early Pearl.....	97	3% off-type
W. Atlee Burpee Co., Philadelphia, Pa.				
940 F	Turnip	Clinton Hardware Co., Clinton Purple Top White Globe.....	85	15% Purple Top Strap Leaf Type
515 F	Beets	Harding St., Grain Co., Worcester Detroit Dark Red, No. 7719.....	91	6% Crosby Egyptian Type 3% heart shape
523 F	Cabbage	Perfection Drumhead Savoy.....	91	9% Rutabaga
525 F	Turnip	Purple Top White Globe.....	97	3% double top
Northampton Plumbing & Hardware				
Co., Northampton				
659 F	Cabbage	Burpee's Copenhagen Market.....	68	32% Danish Ball Head Type
654 F	Radish	White Icicle.....	98	2% purple flesh

Table 4
Field Tests of Vegetable Seeds (continued)

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Arthur R. Conc. Inc., Buffalo, N. Y.				
1005 F	Beet	Haley's Grain Store, Palmer Early Blood.....	96	4% long tapered root
1002 F	Turnip	Purple Top White Globe.....	88	9% white rooted 3% purple rooted
929 F	Beet	Wallace Grain Co., Clinton Detroit Dark Red.....	97	3% Crosby Egyptian Type
930 F	Carrot	Hutchinson.....	96	4% Chantenay Type
Crosman Seed Corp., Rochester, N. Y.				
499 F	Cabbage	S. S. Kresge Co., Boston Danish Ball Head Short.....	95	5% double headed
Eastern States Farmers' Exchange, West Springfield, Mass.				
28 F	Cabbage	Eastern States Farmers' Exchange, Taunton Golden Acre, Yellows Resistant.....	82	18% double headed
Eastern States Farmers' Exchange, Waltham				
147 F	Turnip	Amber Globe, No. C-620.....	97	3% Purple Top Strap Leaf Type
Frederick W. Eberle, Albany, N. Y.				
108 F	Cabbage	Frank Botelho, Somerset Golden Acre.....	94	6% double headed
Fredonia Seed Co., Fredonia, N. Y.				
905 F	Cabbage	Scott Hardware Co., Lowell Early Jersey Wakefield.....	94	6% double headed
907 F	Radish	French Breakfast.....	98	2% purple flesh
908 F	Turnip	Purple Top White Globe.....	88	3% white rooted 3% double top 6% Purple Top Strap Leaf Type
Thomas J. Grey Co., Abington, Mass.				
627 F	Beet	Crosby's Egyptian.....	88	12% Detroit Dark Red Type
634 F	Rutabaga	American Purple Top.....	93	7% Strap-Leaf Turnip Type
633 F	Turnip	White Egg.....	94	6% Purple Top White Globe Type
Joseph Harris Co., Rochester, N. Y.				
60 F	Cabbage	Joseph Harris Co., Lexington Red Acre, No. 862.....	88	12% triple headed
602 F	Radish	Dominic Pizzi, Waltham Cavalier, No. 962.....	85	15% French Breakfast Type
Chas. C. Hart Seed Co., Wethersfield, Conn.				
167 F	Corn	W. K. Gilmore & Sons, Inc., Medfield Bancross.....	0	Found to be Golden Cross Bantam
165 F	Radish	Ea. Scarlet Globe.....	94	6% deep purple flesh
Pierce Hardware Co., Taunton				
2 F	Cabbage	All Season.....	95	5% double headed
4 F	Cabbage	Danish Ball Head Short Stem.....	94	6% off-type
3 F	Cabbage	Golden Acre.....	94	6% double headed
1 F	Cabbage	Mammoth Red Rock.....	94	6% green type

Table 4
Field Tests of Vegetable Seeds (continued)

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type %	Remarks
Budd D. Hawkins, Reading, Vt.				
1030 F		Home Supply Co., Orange, True Early Winningstadt.	80	20% round headed type
D. Landreth Seed Co., Philadelphia, Pa.				
1119 F	Beet	Smith Mills Co., No. Dartmouth Crosby Egyptian.	50	50% Detroit Dark Red Type
1118 F	Rutabaga	Macomber.	94	6% American Purple Top Type
Mandeville & King Co., Rochester, N. Y.				
947 F	Carrot	Robinson's Hardware Co., Hudson Danvers Half Long	96	4% Hutchinson Type
946 F	Radish	Scarlet Turnip White Top	90	10% oblong shape
944 F	Turnip	Purple Top White Globe.	97	3% all purple rooted
Michael Leonard Seed Co., Chicago, Ill.				
740 F	Beet	F. X. Robichaud Co., Methuen Crosby Egyptian.	60	40% Detroit Dark Red Type
736 F	Carrot	Hutchinson.	50	50% Chantenay Type
745 F	Carrot	Improved Long Orange.	98	2% bolted to flower
Norlthrup, King & Co., Minneapolis, Minn.				
192 F	Beet	F. W. Woolworth & Co., Boston Extra Early Flat Egyptian.	88	6% Globe Shape; 4% orange flesh; 2% double top
The Page Seed Co., Greene, N. Y.				
459 F	Cabbage	J. H. Fairbanks Co., Bridgewater Early Jersey Wakefield.	90	10% round headed
414 F	Radish	Early Scarlet Globe.	98	2% purple flesh
412 F	Rutabaga	Macomber.	89	11% American Purple Top
J. B. Rice, Jr., Shushan, N. Y.				
1035 F	Turnip	P. F. Elmer, Millers Falls Purple Top White Globe.	85	12% P. T. Strap Leaf 3% White Egg
Joseph Sordillo & Sons, Boston, Mass.				
665 F	Cabbage	Savoy.	93	7% Broccoli
664 F	Rutabaga	Sweet Germain.	60	40% White Flat Dutch turnip type
Tri-State Seed Co., Philadelphia, Pa.				
105 F	Cabbage	Frank Botelho, Somerset Golden Acre.	88	12% off-type
104 F	Cabbage	Green Acre.	93	7% triple headed
F. H. Woodruff & Sons, Inc., Milford, Conn.				
138 F	Cabbage	Farm Bureau Assoc. Waltham Golden Acre, No. 36765.	93	7% Ball Head Type
131 F	Radish	Cavalier, No. 2-2110.	96	4% light pink flesh
General Mills, Farm Service Div., Leominster				
972 F	Beet	Crosby Egyptian.	79	18% Detroit Dark Red Type 3% pink flesh

Table 4
Field Tests of Vegetable Seeds (concluded)

Lab. No.	Kind of Seed	Wholesale Distributor, Variety of Seed and Lot Number, Dealer When Other Than Wholesale Distributor, and Place Collected	True to Type $\frac{\sigma}{\%}$	Remarks
F. H. Woodruff & Sons, Inc.,—(continued)				
S-428 F	Cabbage	State Farm, Bridgewater Danish Ball Head.....	90	10% triple headed
43 F	Beet	Waldron Hardware Co., Taunton Detroit Dark Red.....	65	35% tapered root shape
44 F	Beet	Early Wonder.....	97	3% Globe Shape
50 F	Radish	Sparkler White Tip.....	92	8% bolted to seed
954 F	Turnip	Wood Sq. Hardware Co., Hudson White Egg.....	85	9% Purple Top White Globe 6% Purple stem
S-486 F	Beet	Wrentham State Hospital, Wrentham Crosby Egyptian.....	80	20% Detroit Dark Red Type
S. D. Woodruff & Sons, Orange, Conn.				
921 F	Carrot	Conant-Littleton Co., Littleton Hutchinson.....	94	6% Chantenay Type
S-485 F	Radish	Wrentham State Hospital, Wrentham Cherry Belle, No. 15 12017.....	98	2% long top; tapered root: white flesh

In general the seed tested this year conformed very well to type as stated. Comparing the 1951 performance with the 1952 performance it can be seen that, although the total percent off-type for 1952 was less than in 1951, the percent, 10% or more, off-type was greater in 1952. Performance of the nine kinds of vegetables grown in 1952 and the ten grown in 1951 is recorded below.

	No. Lots		No. Lots Off-Type		Total % Off-Type		10% or better Off-Type	
	1952	1951	1952	1951	1952	1951	1952	1951
Beans.....	56	48	0	0	0	0	0	0
Beets.....	33	30	13	14	39	46	24	5
Broccoli.....	15	16	0	1	0	6	0	0
Cabbage.....	39	41	17	17	43	41	17	7
Chinese Cabbage.....	0	2	0	0	0	0	0	0
Corn.....	46	59	1	2	2	3	0	1
Carrot.....	38	36	5	8	13	22	2	3
Radish.....	31	24	10	13	32	52	6	4
Rutabaga.....	19	15	4	6	21	42	5	1
Turnip.....	24	29	9	12	37	40	20	6

The 1952 average total percent off-type on the total number of lots was 19.5%.

The 1951 average total percent off-type on the total number of lots was 24.3%.

STUDIES OF FLOWER SEEDS

Conducted by the Seed Laboratory
 Waldo C. Lincoln, Jr., Laboratory Assistant
 Under the Supervision of
 Clark L. Thayer, Professor, Department of Floriculture

This is the seventeenth year in which flower seed studies have been conducted by the Seed Laboratory to determine the quality of flower seeds offered for sale in various retail outlets. Seed of 339 lots, representing 55 genera, packeted by 20 wholesalers or distributors, were obtained from 58 retail sources by the Seed Inspector. One lot of *Calonyction* (Moonflower) and 8 perennials were collected but not tested.

The lots were distributed among the various genera as follows:

Ageratum	9	Dimorphotheca	1	Nierembergia	1
Alyssum	23	Dianthus	2	Nigella	1
Anchusa	4	Didiscus	2	Papaver	2
Antirrhinum	3	Eschscholtzia	2	Petunia	39
Arctotis	2	Euphorbia	1	Phacelia	2
Brachycome	2	Gaillardia	2	Phlox	4
Calendula	15	Gypsophila	4	Portulaca	9
Calliopsis	1	Helichrysum	2	Reseda	2
Callistephus	15	Hunnemania	1	Salpiglossis	3
Celosia	5	Iberis	10	Salvia	4
Centaurea	12	Impatiens	5	Scabiosa	5
Cheiranthus	1	Kochia	1	Schizanthus	1
Chrysanthemum	1	Linaria	2	Statice	1
Clarkia	1	Lupinus	1	Tagetes	35
Cleome	1	Malcomia	1	Tithonia	2
Cosmos	20	Molucella	1	Tropaeolum	3
Cynoglossum	1	Nemesia	2	Verbena	4
Delphinium	14	Nemophila	2	Vinca	1
		Nicotiana	3	Zinnia	45

Dates of sowing were May 27 and 28. Seeds were sown in twenty-foot sections in the row with the exception of Petunias, which were sown in ten-foot sections. In most cases, the quantity of seed was sufficient to plant the desired section.

Germination tests were made in the laboratory for all samples of seed. The results of laboratory germination are shown only for samples that gave few or no plants in the field or with good germination but found otherwise unsatisfactory.

Heavy rains during the germination period and again during emergence of the seedlings tended to pack the soil and in a few instances delayed cultivation until weeds were difficult to eradicate. Abnormally dry weather later in the season, however, did not affect the trial grounds as there were no signs of dryness throughout the entire testing period.

Table 5
Flower Seed Inspection

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Laboratory Germination %	Field Tests
				Performance
Joseph Breck & Sons, Boston, Mass.				
567 F	Molucella	Bells of Ireland	12	Satisfactory
572 F	Calendula	Breck's Giant Orange	88	4% Yellow
568 F	Iberis	Breck's Choice Mixture	94	4 colors; color distribution mostly lavender
585 F	Petunia	Fire Chief	16	No field germination
594 F	Zinnia	Lilliput-Salmon Gem	92	100% off type; not a Lilliput; mixture of 8 colors
593 F	Zinnia	Midget (Breck's)	86	5 colors; 4% not Midget
Winer Hardware Co., Randolph				
270 F	Tagetes	Yellow Supreme	93	5% Orange
W. Atlee Burpee Co., Philadelphia, Pa.				
Leominster Hardware Co., Stoughton				
810 F	Iberis	Mixed	87	Only 2 colors
Crosman Seed Corp., Rochester, N. Y.				
Ben Franklin Store, Chelmsford				
381 F	Portulaca	Double Mixed	80	5 colors; 12% single
Ferry-Morse Seed Co., Detroit, Mich.				
Flynn's Hardware Co., Attleboro				
299 F	Calendula	Gold (Lemon Queen)	55	3% Orange Type
United Co-operative Society, Maynard				
316 F	Alyssum	Little Gem	72	10% Tall Type
Fredonia Seed Co., Fredonia, N. Y.				
Duggan Supply Co., Newburyport				
834 F	Portulaca	Single Mix	64	6 colors; 4% double
Thomas J. Grey Co., No. Abington, Mass.				
641 F	Anchusa	Blue Bird	11	No field germination
638 F	Arctotis	Mixed	26	Too few plants for Performance test
643 F	Impatiens	Camellia Mixed	94	4 colors; 96% not Camellia flowered
Chas. C. Hart Seed Co., Wethersfield, Conn.				
Hingham Hardware Co., Hingham				
330 F	Iberis	Mixed	0	
333 F	Impatiens	Double Mix	82	40% single; 5 colors
Lockhart Hardware Co., Natick				
220 F	Ageratum	Blue Perfection	4	Too few plants for Performance test
222 F	Alyssum	Little Gem	60	12% Tall White Type
219 F	Centaurea	Double Blue Florist Strain	21	No field germination
Lynde Hardware Co., Gardner				
820 F	Zinnia	Lilliput Pink	87	15% Orange or shades thereof
821 F	Zinnia	Lilliput Yellow	83	2% Orange
Sabourin Hardware Co., Fitchburg				
272 F	Scabiosa	Mourning Bride Mixture	17	Did not mature
273 F	Zinnia	California Giants Mixed	75	4 colors; 2% Fantasy

Table 5
Flower Seed Inspection (continued)

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Laboratory Germination %	Field Tests
				Performance
Chas. C. Hart Seed Co.—(continued)				
231 F	Petunia	Saunders Hardware Co., Middleboro Balcony Blue.....	2	Too few plants for Performance test
248 F	Gypsophila	Wentworth Hardware Co., Ayer White.....	6	No field germination
Budd D. Hawkins, Reading, Vt.				
803 F	Alyssum	I. B. Barrows & Co., Worcester Little Gem.....	60	12% Tall Type
802 F	Iberis	Fine Mixture.....	0	
399 F	Petunia	Finest Striped & Blotched.....	19	Too few plants for Performance test
801 F	Zinnia	Fantasy Mixed.....	31	Too few plants for Performance Test
Mandeville & King Co., Rochester, N. Y.				
312 F	Petunia	Allen's Hardware Co., Brockton Violaacea.....	65	2% Rosy Morn
853 F	Papaver	Central Hardware Co., Woburn Shirley-Single.....	88	6% double
265 F	Celosia	Colonial Hardware Co., Stoughton Brilliant Red.....	76	4% Orange; 4% Crested Type
850 F	Petunia	Foster Farrar Co., Northampton Howard's Star.....	44	7% off -type
323 F	Zinnia	Parker Hardware Co., Maynard Little Red Riding Hood.....	88	2% Pink
355 F	Celosia	Waite Hardware Co., Webster Feathered—All Colors.....	75	Poor Mixture; 90% Red
361 F	Statice	All Colors.....	6	No field germination
366 F	Zinnia	Wild Fire (Scarlet Fantasy).....	77	4% Pink Fantasy
201 F	Tagetes	Wyman's Garden Centre, Framingham Burpee Gold Odorless.....	54	15% not odorless
Northrup, King & Co., Minneapolis, Minn.				
281 F	Calendula	Central Hardware Co., Fitchburg Orange Shaggy.....	71	20% Yellow Shaggy
278 F	Lupinus	Blue Bonnet.....	1	Too few plants for Performance test
276 F	Zinnia	Lilliput (Canary Yellow).....	90	4% Red
249 F	Tagetes	Harney Hardware Co., Newton Harmony.....	80	4% Tall Type
250 F	Zinnia	Cardinal.....	72	Pink Flowered
257 F	Alyssum	Oliver's Hardware Co., Stoughton Little Gem or Tom Thumb.....	42	18% Tall White Type
255 F	Petunia	Hybrida Blue Bee.....	61	5% General Dodds Type
256 F	Petunia	Hybrida Red—General Dodds.....	79	2% Light Purple
The Page Seed Co., Greene, N. Y.				
1050 F	Portulaca	Weld & Beck Co., Southbridge Double Dwarf Mixed.....	80	5 colors; 25% single

Table 5
Flower Seed Inspection (continued)

Lab. No.	Kind of Seed	Wholesale Distributor, Dealer When Other Than Wholesale Distributor, Place Collected, and Variety of Seed	Laboratory Germination %	Field Tests
				Performance
Ross Seed Co., Worcester				
781 F	Calendula	Orange King.....	85	4% Yellow
786 F	Verbena	Mammoth.....	64	15% White; 5% Red
Sterling Seed Co., Minneapolis, Minn.				
H. L. Green, Taunton				
225 F	Alyssum	Little Gem or Tom Thumb.....	73	15% Tall White Type
230 F	Zinnia	Red Riding Hood.....	85	2% Rose
Tru-Bloom Seed Co., Avila, Cal.				
Centre Hardware Co., Uxbridge.				
1213 F	Portulaca	Double Mix.....	7	No field germination
Vaughan's Seed Store, New York City, New York				
C. H. Symmes & Co., Winchester				
338 F	Alyssum	Little Gem.....	51	4% Tall Type
340 F	Cosmos	Early Sensation Pink & White....	27	50% extremely late in flowering; color satisfactory
S. D. Woodruff & Sons, Orange, Conn.				
Bibeau Hardware Co., Gardner				
822 F	Impatiens	Camellia Flowered Finest Mix....	90	5 colors; 100% not Camellia Flowered
John E. Jordan, Plymouth				
234 F	Alyssum	Little Gem.....	56	Uniform height but medium Tall Type; not a true Little Gem
238 F	Alyssum	Violet Queen.....	39	15% White Alyssum
Middlesex Supply Co., Lowell				
388 F	Impatiens	Camellia Flowered Finest Mix....	56	6 colors; 100% not Camellia Flowered
390 F	Petunia	Large Single Fringed Mixed Colors	28	No field germination
Newburyport Lumber Co., Newburyport				
839 F	Petunia	Rosy Morn.....	93	4% Purple

Performance of flower seeds in the field is summarized in the following table.

Seeds Packeted by	Total No. Samples Tested	No. Samples Satisfactory	No. Samples Unsatisfactory
Joseph Breck & Sons..... Boston, Mass.	38	31	7
W. Atlee Burpee Co..... Philadelphia, Pa.	19	18	1
Crosman Seed Corp..... Rochester, N. Y.	9	8	1
Ferry-Morse Seed Co..... Detroit, Mich.	35	33	2
Fredonia Seed Co..... Fredonia, N. Y.	5	4	1
Thomas J. Grey Co..... Abington, Mass.	10	7	3
Joseph Harris Co..... Rochester, N. Y.	4	4	0
Chas. C. Hart Seed Co..... Wethersfield, Conn.	30	19	11
Budd D. Hawkins..... Reading, Vt.	8	4	4
Hygrade Seed Co..... Fredonia, N. Y.	5	5	0
Mandeville & King Co..... Rochester, N. Y.	62	53	9
Northrup, King & Co..... Minneapolis, Minn.	34	26	8
The Page Seed Co..... Greene, N. Y.	7	6	1
Pelletized Seed Co..... Wynnewood, Pa.	4	4	0
Rice Branch, Associated Seed Growers., Cambridge, N. Y.	19	19	0
Ross Bros. Co..... Worcester, Mass.	10	8	2
Sterling Seed Co..... Minneapolis, Minn.	8	6	2
Tru-Bloom Seed Co..... Avila, Cal.	3	2	1
Vaughan's Seed Store..... New York, N. Y.	5	3	2
S. D. Woodruff & Sons..... Orange, Conn.	24	18	6
	339	278	61

Summary of Inspection

Table 6 is a summary, by wholesalers, of the total number of inspection samples tested in the Seed Laboratory. Complete analysis and germination of those which are mislabeled are shown in the preceding tables.

Table 6

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Abbott & Cob Co. Frankford, Pa.	1	1	0						
Associated Seed Growers, Inc. Milford, Conn.	15	15	0						
Belt Seed Co. Baltimore, Md.				3	3	0	6	4	2
Better Turf Seed Co. Jersey City, N. J.							2	2	0
Boston Market Gardner's Assoc. Boston, Mass.	2	2	0						
Breck, Joseph, & Sons. Boston, Mass.	43	42	1	7	7	0	1	1	0
Burpee, W. Atlee, Co. Philadelphia, Pa.	32	32	0				1	1	0
The Clapper Co. West Newton, Mass.							1	1	0
Comstock, Ferre & Co. Wethersfield, Conn.	16	16	0				1	1	0
Cone, Arthur R., Inc. Buffalo, N. Y.	11	11	0	72	66	6	2	0	2
Cox, Charles M., Co. Boston, Mass.				1	1	0			
Craver Dickinson Co. Buffalo, N. Y.				1	0	1			
Crawford Nursery Providence, R. I.							2	1	1
Crosman Seed Corp. Rochester, N. Y.	24	24	0						
Dickinson, Albert, Co. Chicago, Ill.				1	1	0			
Duryea Seed Co. New York, N. Y.				4	4	0	1	1	0
Eastern States Farmers' Exchange West Springfield, Mass.	45	42	3	24	23	1	1	1	0
Eberle, Frederick W. Albany, N. Y.	11	11	0						
Edgewood Farms Ridgewood, N. J.				1	1	0			
Ferry Morse Seed Co. Detroit, Mich.	24	24	0						
Forbes, Alexander, Co. Newark, N. J.	10	10	0						
Fredonia Seed Co. Fedonia, N. Y.	12	12	0						

Table 6
Summary of Inspection—continued.

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Garfield, Williamson, Co..... Jersey City, N. J.							1	0	1
General Importing Co..... Boston, Mass.	5	5	0				1	1	0
Grey, Thomas J., Co..... Abington, Mass.	14	14	0						
Gunson, L. P., & Co..... Rochester, N. Y.	1	1	0						
Harris, Joseph, Co..... Rochester, N. Y.	29	29	0						
Hart, Charles C. Seed Co..... Wethersfield, Conn.	44	42	2	4	3	1	1	0	1
Hawkins, Budd D..... Reading, Vt.	16	16	0						
Henderson, Peter, & Co..... New York City, N. Y.	2	2	0						
Hygrade Seed Co..... Fredonia, N. Y.	6	6	0						
Johnson, J. Oliver, & Son..... Chicago, Ill.							3	1	2
Landreth, D. Seed Co..... Philadelphia, Pa.	4	4	0	3	2	1	2	0	2
Lee, Patten Co..... Jersey City, N. J.							2	2	0
Lyon, John D., Inc..... Cambridge, Mass.				4	4	0	2	2	0
Mandeville & King Co..... Rochester, N. Y.	16	16	0						
Michael Leonard Seed Co..... Chicago, Ill.	13	13	0						
Northrup, King & Co..... Minneapolis, Minn.	19	19	0						
O'Brien, J. T..... Philadelphia, Pa.	6	5	1						
O & M Seed Co..... Green Springs, Ohio				1	1	0			
Ostberg Seed Co..... Chicago, Ill.							2	1	1
The Page Seed Co..... Greene, N. Y.	15	15	0	19	18	1	2	0	2
Park & Pollard Co..... Buffalo, N. Y.				1	0	1			
Pedigreed Seed Co..... New York City, N. Y.							3	1	2
Pelletized Seed Co..... Wynnewood, Pa.	6	6	0						
Philadelphia Seed Co..... Philadelphia, Pa.							2	0	2

Table 6
Summary of Inspection—concluded

Wholesale Distributors	Vegetables			Field Crops			Mixtures		
	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled	Samples Tested	Correctly Labeled	Mislabeled
Rice Branch, Associated Seed Growers Cambridge, N. Y.	4	4	0	.....	.....	.....	.....	.....	.....
Rice, Jerome B. Seed Co..... Cambridge, N. Y.	7	7	0	.....	.....	.....	.....	.....	.....
Ross Bros. Co..... Worcester, Mass.	23	23	0	.....	.....	.....	.....	.....	.....
Rowe, Charles H..... Philadelphia, Pa.	4	4	0	.....	.....	.....	.....	.....	.....
Scarlett, Wm. G., & Co..... Baltimore, Md.	.....	.....	.....	34	33	1	5	4	1
Scott, O. M. Seed Co..... Marysville, Ohio	.....	.....	.....	.....	.....	.....	1	1	0
Sears, Roebuck & Co..... Chicago, Ill.	9	9	0	.....	.....	.....	.....	.....	.....
Sordillo, Joseph, & Son..... Boston, Mass.	6	6	0	.....	.....	.....	.....	.....	.....
Stanford Seed Co..... Buffalo, N. Y.	.....	.....	.....	31	27	4	2	2	0
Teweles, F. Seed Co..... Milwaukee, Wisc.	.....	.....	.....	.....	.....	.....	1	1	0
Tri-State Seed Co..... Philadelphia, Pa.	17	16	1	.....	.....	.....	.....	.....	.....
Vaughan's Seed Store..... New York City, N. Y.	16	16	0	.....	.....	.....	.....	.....	.....
Whitney Seed Co..... Buffalo, N. Y.	.....	.....	.....	38	38	0	2	2	0
Woodruff, F. H., & Sons..... Milford, Conn.	105	100	5	.....	.....	.....	1	1	0
Woodruff, S. D., & Sons..... Orange, Conn.	38	38	0	5	3	2	1	1	0
Totals.....	671	658	13	254	235	19	52	33	19

AGRICULTURE

BLACKSTONE, MASS.

Thirty-third Annual Report of Pullorum Disease Eradication in Massachusetts



During the 1952-53 testing season 461 chicken, turkey, and pheasant flocks were tested. A total of 1,203,874 samples was tested, of which 0.04 percent were positive. Seven flocks that were negative the previous season revealed reactors this past season. At the close of the testing year only five flocks were classified as infected. Furthermore, 99.27 percent of all the birds tested were located in nonreacting flocks. Massachusetts flock owners are to be complimented on the progress that is being made in establishing and maintaining pullorum-free flocks.

THIRTY-THIRD ANNUAL REPORT OF PULLORUM DISEASE ERADICATION IN MASSACHUSETTS 1952-53

By the Poultry Disease Control Laboratory¹

INTRODUCTION

Testing results for the 1952-53 season continue to show progress in pullorum disease eradication in Massachusetts. The volume of testing work was slightly less than that of the previous season. The average percentage of positive tests remains at a very low figure (0.04). Fewer "breaks" were detected among previously nonreacting flocks. Only five flocks were classified as positive at the close of the season. Furthermore, 98.28 percent of all birds tested were in 100 percent tested nonreacting flocks.

During the past year the testing operations were carried out with few difficulties, and the flocks, for the most part, were tested at a time requested by the flock owners. It is hoped that the close cooperation existing among the flock owners, laboratory, and other agencies may continue in order to carry out an effective program.

We also wish to express our appreciation for the assistance given by the Extension Service, Massachusetts Department of Agriculture, and other agencies in making this program a success.

SUMMARY OF SERVICE RENDERED

Flocks tested.....	461
Chicken flocks	371
Turkey flocks	66
Pheasant flocks	24
Number of tests	1,203,874
Chickens:	
Routine	1,161,410
Experimental	7,329
Fowl other than chickens:	
Routine	35,127
Experimental	8
Owners receiving necropsy service	26
Necropsies of reacting birds	37

¹Poultry Disease Control Laboratory Staff: H. Van Roekel, Research Professor in charge; G. H. Snoeyenbos, G. P. Faddoul, Jack E. Gray, Research Professors; Miriam K. Clarke, O. M. Olesiuk, Joseph E. Gray, Assistant Research Professors; G. W. Fellows, R. L. Bennett, C. G. Smyser, Jr., L. P. Beninato, Research Assistants. Appreciation is extended to Dr. K. L. Bullis, Head of the Department, for the assistance given to the testing work.

Table 1. Distribution of Tests and Reactors by Counties and by Breeds

Breeds	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Norfolk	Plymouth	Worcester	Totals	Percent Positive
Rhode Island Reds														
Total tests.....	6,957	2,337	55,447	337	19,314	16,091	11,827	6,351	43,807	55,092	25,679	75,841	319,080	0.11
Positive tests.....	0	0	5	0	0	0	0	0	345	0	0	0	350	
New Hampshires														
Total tests.....			30,497		73,469	934	668	4,402	43,548	15,219	68,443	22,288	259,468	0.003
Positive tests.....			0		0	0	0	0	9	0	0	0	9	
Barred Plymouth Rocks														
Total tests.....	1,010	4,941	41,733	5,344	10,451	13,367	557	2,898	61,886	23,923	52,287	36,241	254,638	0.002
Positive tests.....	0	0	0	0	0	3	0	0	1	0	0	0	4	
White Plymouth Rocks														
Total tests.....	78	7,964	13,002		47,287	5,500	2,206	25,793	66,221	9,653	37,293	16,565	231,562	0.05
Positive tests.....	0	0	0		3	114	0	1	0	0	1	0	119	
White Leghorns														
Total tests.....		13,970	1,046		7,982	3,751	652	1,850	167	12,124		2,439	43,981	0.00
Positive tests.....		0	0		0	0	0	0	0	0		0	0	
Miscellaneous														
Total tests.....	298	515	9,839		17,686	914	231	1,415	10,349	11,070	4,212	3,481	60,010	0.00
Positive tests.....	0	0	0		0	0	0	0	0	0	0	0	0	
Total Tests.....	8,343	29,727	151,564	5,681	176,189	40,557	16,141	42,709	225,978	127,081	187,914	156,855	1,168,739	
Positive test Number.....	0	0	5	0	3	117	0	1	355	0	1	0	482	
Percent.....	0.00	0.00	0.003	0.00	0.002	0.29	0.00	0.002	0.16	0.00	0.0005	0.00	0.04	

DISTRIBUTION OF TESTS AND REACTORS

Table 1 reveals that 1,168,739 samples were received from chicken flocks in 12 counties. The percentage of reactors was 0.04. Middlesex, Plymouth, Essex, and Worcester Counties lead in the number of samples tested. No reactors were detected in Barnstable, Berkshire, Dukes, Hampden, Norfolk, and Worcester Counties. In all except two of the remaining counties the percentage of reactors did not exceed 0.003.

The following breeds were tested: Bantam, Barred Plymouth Rock, Brahma, Columbian, Cornish, Crosses, Delaware, Eisenbar, New Hampshire, Rhode Island Red, White American, White Leghorn, White Plymouth Rock, White Wyandotte.

The Rhode Island Red, New Hampshire, Barred Plymouth Rock, and White Plymouth Rock were the predominating breeds tested. Of the total samples, 27.30 percent were taken from Rhode Island Red, 22.20 percent from New Hampshire, 21.79 percent from Barred Plymouth Rock, 19.81 percent from White Plymouth Rock, and the balance from other breeds tested. Of the 1,064,198 samples collected from females, 40,632 were from hens and 1,023,566 from pullets, with 0.20 and 0.04 percent reactors, respectively. Among the 104,541 samples collected from the males, 0.01 percent were positive.

ANNUAL TESTING OF FLOCKS

Table 2 lists the results from flocks tested (1) for the first time, (2) intermittently, (3) for two consecutive years, and (4) for three or more consecutive years.

The number of flocks, birds, and samples tested in the first three groups does not vary markedly. The higher percentage of positive tests in the first group was due to a heavy infection in one flock. Only two flocks in the first three groups were classified as positive at the close of the season. These results suggest, as has been mentioned before, that flocks tested intermittently usually reveal a higher incidence of infection than flocks tested for two or more consecutive years. The average number of birds per flock in the respective groups is as follows: first year, 1,337; intermittent, 2,023; and two consecutive years, 2,529.

Table 2. Annual Testing Versus Single and Intermittent Testing

Classification	Flocks	Birds	Total Tests	Positive Tests		Negative Flocks		Positive Flocks	
				Number	Percent	100 Percent Tested	Partially Tested	100 Percent Tested	Partially Tested
Tested for the first time	34	45,461	49,549	262	0.53	31	2	1	-
Intermittent testing	21	42,485	42,485	83	0.20	20	-	-	1
Two consecutive years	25	63,220	63,789	1	0.002	23	2	-	-
Three or more consecutive years .	291	1,004,193	1,012,916	136	0.01	283	5	3	-
TOTALS	371	1,155,359	1,168,739	482	0.04	357	9	4	1

In the group tested for three or more consecutive years there were 291 flocks, representing 1,012,916 tests, of which 0.01 percent were positive. Among the flocks tested, 288 were nonreacting and three were positive. The average number of birds per flock was 3,451.

For the four groups as a whole, 371 flocks were tested, representing 1,155,359 birds and 1,168,739 samples, of which 0.04 percent were positive. The 357 flocks, which were 100 percent tested and nonreacting, contained 1,135,436 birds or 98.28 percent of the total birds tested. Five flocks, representing 8,427 birds, were classified as positive. The average percentage of reactors among these birds was 5.65.

During the past year, 101 or 22.82 percent of the flocks tested in 1951-52 were not tested. In flocks tested one year and not the next, infection is more likely to become established among the birds than in flocks tested annually. Owners of breeding flocks should adopt a program that will be effective in maintaining a pullorum-clean flock. Annual testing of flocks is recognized as essential in the control and eradication of pullorum disease.

APPEARANCE OF INFECTION IN FLOCKS PREVIOUSLY NEGATIVE

During the past year pullorum "breaks" were observed in seven flocks. Four flocks revealed less than 0.5 percent infection. In one flock 6.19 percent reactors were detected.

The purchase of questionable stock appeared to be the source of infection in four cases, whereas, in the other cases, the origin of infection could not be determined. Four flocks were retested and classified as nonreacting at the close of the season.

In Table 3 is given the incidence of "breaks" among Massachusetts tested flocks during the past fourteen years. The percentage of "breaks" has decreased slightly in comparison with that of the previous season. The incidence of "breaks" can be reduced further, if flock owners will observe the preventive measures recommended for pullorum disease. This past year several of the "breaks" could have been avoided if the flock owners had been more cautious in the purchase of their replacement stock. Thorough checking with the official state agency regarding the status of breeding flocks is recommended. Too often flock owners consult "outdated" lists of approved flocks or they may take for granted that the source or sources from which purchases are to be made appear satisfactory. Each "break" may serve as an additional focus of infection for disseminating the disease to other flocks. This was definitely true in one case this past year in which the flock revealed 6.19 percent reactors, and hatching eggs were being accepted from this flock by an out-of-state hatchery before the flock was tested. Lax procedures of this type will prolong our efforts to control and eradicate pullorum disease from our flocks. Flock owners and hatcherymen are urged, therefore, to maintain strictest vigilance against the introduction and spread of the disease.

The following measures have been found to be effective in establishing and maintaining a pullorum-free flock:

1. All the birds on the premises should be tested each year.
2. If infection is present, the entire flock should be retested within four to six weeks until a negative report is obtained, provided the value of the birds justifies the expenditure.
3. Every reactor, regardless of its value, should be removed from the premises and sold for slaughter immediately upon receipt of the reports.

Table 3. The Incidence of "Breaks" Observed During the Past Fourteen Years

Year	Number of Flocks	Breaks		Flocks with Less Than 0.5 Percent Infection on First Test	
		Number	Percent	Number	Percent
1940	266	6	2.25	2	33.33
1941	251	5	1.99	4	80.00
1942	255	6	2.35	3	50.00
1943	286	13	4.54	8	61.54
1944	289	17	5.88	13	76.47
1945	340	21	6.18	17	80.95
1946	388	20	5.15	14	70.00
1947	430	17	3.95	9	52.94
1948	425	16	3.76	13	81.25
1949	386	6	1.55	3	50.00
1950	383	18	4.70	16	88.88
1951	381	6	1.57	6	100.00
1952	417	8	1.92	5	62.50
1953	371	7	1.89	4	57.14

4. Offal from all birds dressed for market or home consumption as well as dead birds that are not fit for consumption should be burned.

5. The poultry houses, runs, and equipment should be thoroughly cleaned and disinfected immediately after removal of reactors. An empty pen to each house should be provided to facilitate cleaning and disinfection during the winter months. Disinfectants approved by the United States Department of Agriculture should be used.

6. Birds removed from the premises to egg-laying contests, exhibitions, etc., should be held in quarantine and determined free of disease before they are readmitted into the flock.

7. Purchase of stock in the form of adults, chicks, and eggs should be from known pullorum disease-free flocks. The Massachusetts Department of Agriculture, 41 Tremont Street, Boston, should be consulted regarding additions or replacements in the flock.

8. Eggs should not be saved for hatching until after a flock has been tested and all the infected birds removed. Early pullet testing will permit early hatching.

9. Fresh and infertile eggs from unknown or infected sources should not be fed to chickens or exposed to birds or animals, such as crows, sparrows, and skunks, that may carry or spread the infection.

10. Poultrymen should not custom-hatch for untested or infected flocks (including fowl other than chickens).

11. Owners of pullorum disease-free flocks should not permit hatching where infected eggs or stock may be found.

12. Poultrymen should not buy feed in bags that have been used or exposed to infection. (Such bags if properly disinfected will be safe for further use.)

13. Poultrymen should regard fowl other than chickens as a possible source of pullorum infection unless tested and found free from pullorum disease.

14. Poultrymen should not use equipment that has been exposed to or contaminated with infective material unless it is properly cleaned and sterilized or disinfected.

TESTING FOWL OTHER THAN CHICKENS

During the past year, 35,135 samples from fowl other than chickens including 27,189 turkeys, 6,348 pheasants, 1,367 quail, 93 partridge, 90 geese, 28 guinea fowl, 10 game birds, 8 ducks, and 2 pea fowl were tested. No reactors were detected.

NONREACTING AND POSITIVE FLOCKS CLASSIFIED BY COUNTIES

Table 4 reveals that 366 nonreacting flocks, representing 1,146,932 birds, were identified in 12 counties. A total of 357 flocks, representing 1,135,436 birds, was 100 percent tested, whereas 9 flocks that contained 11,496 birds were partially tested. In Barnstable, Dukes, Essex, Hampden, and Hampshire Counties all the flocks tested were 100 percent tested nonreacting.

At the close of the season only five flocks, representing 8,427 birds, were classified as positive. These flocks were located in Bristol, Franklin, and Middlesex Counties.

It is hoped that in the near future all tested flocks will be 100 percent tested and classified in the nonreacting group. This goal can be obtained if flock owners and hatcherymen will be vigilant in their control and eradication measures.

Table 4. Nonreacting and Positive Flocks Classified by Counties

County	100 Percent Tested		Partially Tested		Totals	
	Flocks	Birds	Flocks	Birds	Flocks	Birds
Nonreacting Flocks						
Barnstable.....	4	8,343	—	—	4	8,343
Berkshire.....	6	28,937	1	790	7	29,727
Bristol.....	47	145,856	2	3,603	49	149,459
Dukes.....	1	5,681	—	—	1	5,681
Essex.....	53	173,393	—	—	53	173,393
Franklin.....	20	38,668	—	—	20	38,668
Hampden.....	11	16,141	—	—	11	16,141
Hampshire.....	18	41,259	—	—	18	41,259
Middlesex.....	59	209,943	3	4,189	62	214,132
Norfolk.....	32	126,824	1	257	33	127,081
Plymouth.....	58	184,565	1	1,855	59	186,420
Worcester.....	48	155,826	1	802	49	156,628
TOTALS...	357	1,135,436	9	11,496	366	1,146,932
Positive Flocks						
Bristol.....	1	610	—	—	1	610
Franklin.....	1	1,889	—	—	1	1,889
Middlesex.....	2	5,469	1	459	3	5,928
TOTALS...	4	7,968	1	459	5	8,427

COMPARISON OF 1951-52 AND 1952-53 TESTING

In Table 5 are listed the testing data for the past two seasons. Fewer flocks, birds, and samples were tested in 1952-53 than in the 1951-52 season. Only one county had more flocks and birds tested this past season than in 1951-52. Fewer nonreacting flocks were detected than in 1951-52.

This general decrease in tested flocks, birds, and samples can be attributed to economic conditions. The demand for hatching eggs and chicks has decreased considerably during the past year. Also, other areas in poultry production have not been very profitable. It is hoped that when adjustments have been made that increased attention can be given to the eradication of the disease. Poultrymen should not adopt the attitude that the industry has gone as far as it can go in eradicating pullorum disease. It may be difficult to eliminate that last trace of the infection, but it can be accomplished if all agencies will cooperate in this common objective.

Table 5. Comparison of 1951-52 and 1952-53 Testing

County	Flocks	Birds	Tests	Positive Tests Percent	Non- reacting Flocks
1951-52 Season					
Barnstable.....	5	34,195	34,195	0.00	5
Berkshire.....	9	35,441	35,441	0.00	9
Bristol.....	61	160,505	160,505	0.00	61
Dukes.....	1	5,204	5,204	0.00	1
Essex.....	49	157,091	157,091	0.00	49
Franklin.....	24	50,590	50,596	0.008	23
Hampden.....	18	22,807	23,647	0.62	17
Hampshire.....	21	55,488	55,488	0.00	21
Middlesex.....	69	273,511	284,116	0.002	69
Norfolk.....	38	159,843	173,614	0.002	37
Plymouth.....	59	189,130	189,130	0.00	59
Worcester.....	63	200,150	201,403	0.03	61
TOTALS.....	417	1,343,955	1,370,430	0.016	412
1952-53 Season					
Barnstable.....	4	8,343	8,343	0.00	4
Berkshire.....	7	29,727	29,727	0.00	7
Bristol.....	50	150,069	151,564	0.003	49
Dukes.....	1	5,681	5,681	0.00	1
Essex.....	53	173,393	176,189	0.002	53
Franklin.....	21	40,557	40,557	0.29	20
Hampden.....	11	16,141	16,141	0.00	11
Hampshire.....	18	41,259	42,709	0.002	18
Middlesex.....	65	220,060	225,978	0.16	62
Norfolk.....	33	127,081	127,081	0.00	33
Plymouth.....	59	186,420	187,914	0.0005	59
Worcester.....	49	156,628	156,855	0.00	49
TOTALS.....	371	1,155,359	1,168,739	0.04	366

THIRTY-THREE-YEAR TESTING SUMMARY

Table 6 is a summary of the testing results for the thirty-three years of testing. The outstanding result among the data for 1952-53 is that 99.27 percent of all birds tested are in nonreacting flocks.

Table 6. Thirty-three-Year Pullorum Disease Testing Summary

Season	Flocks	Birds	Total Tests	Positive Tests Percent	Non-reacting Flocks	Birds in Non-reacting Flocks	
						Number	Percent
1920-21	108	24,718	24,718	12.50	25	2,414	9.77
1921-22	110	29,875	29,875	12.65	27	4,032	13.50
1922-23	121	33,602	33,602	7.60	29	5,400	16.07
1923-24	139	59,635	59,635	6.53	38	11,082	18.58
1924-25	156	66,503	66,503	2.94	79	25,390	38.18
1925-26	201	67,919	67,919	2.31	124	33,615	49.49
1926-27	249	127,327	127,327	4.03	114	40,269	31.63
1927-28	321	190,658	232,091	6.52*	138	80,829	42.39
1928-29	413	254,512	304,092	4.25*	228	153,334	60.25
1929-30	460	331,314	386,098	2.17	309	203,038	66.97
1930-31	447	356,810	402,983	1.47	328	267,229	74.89
1931-32	455	377,191	420,861	0.90	355	298,534	79.15
1932-33	335	296,093	300,714	0.47	276	238,074	80.41
1933-34	262	263,241	284,848	0.53	229	212,782	80.83
1934-35	244	281,124	301,887	0.39	213	251,778	89.56
1935-36	252	329,659	344,081	0.30	230	315,215	95.95
1936-37	307	448,519	561,762	0.37	281	424,431	94.63
1937-38	308	480,227	497,769	0.17	286	457,466	95.26
1938-39	355	571,065	615,205	0.34	327	469,134	82.15
1939-40	346	573,000	673,222	0.51	332	497,356	86.80
1940-41	309	527,328	538,589	0.09	299	492,475	93.39
1941-42	366	653,080	662,715	0.27	350	591,628	90.59
1942-43	332	637,666	649,137	0.48	317	600,607	94.19
1943-44	413	762,066	791,596	0.11	386	721,229	94.64
1944-45	458	836,481	943,987	0.12	431	792,551	94.75
1945-46	538	1,125,737	1,225,594	0.12	513	1,085,726	96.45
1946-47	562	1,156,147	1,238,983	0.13	534	1,112,043	96.19
1947-48	494	1,219,957	1,272,547	0.10	476	1,185,852	97.20
1948-49	458	1,179,481	1,213,073	0.04	452	1,171,363	99.31
1949-50	475	1,360,865	1,444,364	0.06	465	1,344,860	98.82
1950-51	448	1,358,540	1,394,192	0.05	442	1,339,068	98.57
1951-52	417	1,343,955	1,370,430	0.016	412	1,324,195	98.53
1952-53	371	1,155,359	1,168,739	0.04	366	1,146,932	99.27

*Based on total birds tested: 1927-28, 190,658 birds; 1928-29, 254,512 birds.

COMMENTS AND SUGGESTIONS

Annual Testing of All Birds on the Premises: As was reported in the previous Annual Report, one of the requirements in the Massachusetts pullorum disease regulations is that all birds, five months or older in a breeding flock, must be tested without reactors in order to qualify for official recognition. It has been observed and reported that some flock owners will use eggs for hatching from untested birds, especially birds held during the summer. Others will hatch from young

pullet flocks at the start of their production and before they are tested. Both practices are not only violations of the official regulation but they constitute a very dangerous practice, which may disseminate pullorum infection to other nonreacting flocks. Too much is taken for granted that a flock with a negative testing history will continue to be negative. If flock owners would realize the dangers involved, it would seem that such practices would be eliminated.

The majority of the birds are tested in the fall and winter months, which constitute the peak months relative to volume of work in the field and in the laboratory. As soon as the flocks become five months of age, flock owners are urged to test them. This will tend to level off the peak load of work which comes in October, November, December, and January. During the late fall and winter months the field work in collecting samples becomes more difficult because of weather conditions. Furthermore, it is extremely difficult or impossible to employ personnel for just a few months. Therefore, flock owners can aid the testing program greatly by testing birds during the summer and early fall months providing the birds are five months of age.

The following summary lists the volume of tests by months:

Months	Number of Tests
April, 1952	28,576
May	36,749
June	52,164
July	85,910
August	119,535
September	131,851
October	195,831
November	159,205
December	161,927
January	144,290
February	48,883
March	35,789
April, 1953	3,164
	1,203,874

Filing Requests for Testing: All flock owners desiring pullorum testing service are sent an application. These application cards giving the necessary information requested are to be returned to the Department of Veterinary Science. During the last few years an increasing number of flock owners have not been filing their applications until late in the season when their flocks are ready to be tested, and they expect testing service on short notice. On the other hand, some flock owners will file a request for a certain testing date, only to cancel it after the laboratory has scheduled the time for the blood collector. Late cancellations of testing dates upset the routing in the laboratory, and frequently our blood collectors may lose a day's work. Also, some flock owners telephone the laboratory requesting immediate service, which usually cannot be given.

The routing of the blood collectors and the collection of the samples can be improved, if the flock owners will file their applications early and, when the time approaches to test the flock, notify the laboratory at least two to three weeks prior to the date of test so that field work can be planned and executed in an efficient and economical manner. We ask all the flock owners to cooperate in this matter.

