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A. B. CONNER, DIRECTOR

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DIVISION OF CHEMISTRY

Commercial Fertilizers in 1938-39 and Their Uses

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS

T. O. WALTON, President

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This is the annual Fertilizer Control Bulletin. It contains statistics regarding fertilizers sold in Texas, information regarding the fertilizer law, and analyses of samples of the fertilizer sold by different manufacturers. The extent to which the various manufacturers are coming up to their guarantee is shown.

The total sales of fertilizer in Texas for 1938-39 were 93,115 tons. In 1937-38 the sales were 79,640 tons. In 1936-37 they were 84,938 tons. Cottonseed meal sold as a feed but used as a fertilizer was not included in these totals. Sales of fertilizer were a little more than last year. Practically all the sales of mixed fertilizers were confined to about 20 analyses.

Tables are given showing the extent to which the various fertilizer manufacturers met or exceeded their guarantees. The cost of fertilizer was slightly less in 1938-39 than in 1937-38.

Suggestions are given for the use of fertilizers on various crops.

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COMMERCIAL FERTILIZERS IN 1938-39 AND THEIR USES

G. S. Fraps, State Chemist; T. L. Ogier, Associate State Chemist; and S. E. Asbury, Assistant State Chemist

Fertilizer laws require fertilizer to be correctly labeled so that the purchaser can know what he is getting. The object of the fertilizer law is to protect the farmer or other users of fertilizer against misrepresentation of the composition or fertilizing value of the fertilizer as well as manufacturers and dealers against unfair competition due to such misrepresentation.

The first Texas fertilizer law was passed in 1899. It was revised and amended in 1911. The results of the fertilizer inspection have been published in bulletins of the Texas Agricultural Experiment Station regularly since 1906. This is the thirty-seventh Fertilizer Control Bulletin. It contains statistics, definitions of terms, a report on the analyses made in enforcing the provisions of the Fertilizer law, and information regarding the use of fertilizers.

Explanation of Terms

Nitrogen refers to the total nitrogen in the fertilizer. It is necessary in proper amounts for the development of all parts of the plant, but an excess of nitrogen delays maturity and is liable to promote growth of stalk and leaves at the expense of fruit. Nitrogen is needed by many Texas soils, especially the sandy soils in the eastern and northern parts of the State. Since nitrogen is used in comparatively large quantities by plants and is, to some extent, washed from the soil, it is usually the first element to become depleted from a fertile soil.

Available phosphoric acid is the phosphoric acid (P_2O_5) in fertilizers which can be taken up quickly by plants. Phosphoric acid promotes the fruiting of plants, though it is also necessary for the development of all parts of the plant.

Total phosphoric acid is the entire quantity of the phosphoric acid (P_2O_5) present, whether highly available or not. A guarantee of total phosphoric acid in place of available is made in bone, tankage, rock phosphate, and basic slag.

Potash guaranteed in a fertilizer is required by law to be soluble in water. Potash, like nitrogen, is needed by all parts of the plant, but especially by stalk and leaves. An excess of potash delays maturity and is liable to promote growth of the stalk and leaves at the expense of the fruit. When potash is abundantly supplied, plants may take up more than they need. Potash is present in soils more abundantly than phosphoric acid.

Valuation per ton represents the approximate average cost of the plant food in the unmixed fertilizer, at retail. It is usually smaller than the price at which the mixed fertilizer is sold, but since it is an average, it may be greater than the prices of some of the unmixed fertilizer materials. The selling price includes cost of mixing, bags, transportation, the profit of the manufacturer if any and that of the dealer. The valuations are decided on about September 1, and the prices often change before the chief active fertilizer season, which is February to April in Texas. The valuation sums the value of the three plant foods shown in the analysis into a single figure, and is convenient for this purpose. The fertilizer law permits a deficiency of less than ten per cent in one plant food to be compensated by an excess of another, but if the valuation is four per cent less than the guaranteed valuation, a rebate must be paid to the purchaser. The valuation found compared with the valuation guaranteed shows whether or not the fertilizer as a whole is better or poorer than the guarantee as a whole. The following valuations were used in 1938-39:

	Cents per pound
Nitrogen	12.0
Available phosphoric acid	6.5
Total phosphoric acid in Thomas phosphate, tankage, and bone meal	4.0
Total phosphoric acid in rock phosphate	1.5
Potash	6.0

Names of fertilizers. Fertilizers are frequently named by numbers, such as a 4-8-4 fertilizer, a 6-12-6 fertilizer and so on. In such names, the first figure stands for the percentage of nitrogen, the second for the percentage of available phosphoric acid, and the third for the percentage of water-soluble potash. This is a short and accurate method of naming fertilizers.

Information on the Fertilizer Bag and Tag

A fertilizer tax tag is required to be placed on every bag of fertilizer before it is offered for sale or sold. The guaranteed analysis of the fertilizer is required by law to be printed on the bag or on the tag attached to the bag, so that the purchaser can see what he is buying. Total phosphoric acid may be guaranteed for bone or tankage instead of available phosphoric acid. A guarantee of total phosphoric acid is required in Thomas phosphate or rock phosphate. The information required on the package is as follows:

Net weight
Name of fertilizer in full
Name and address of manufacturer
Guaranteed analysis:
    Nitrogen, per cent
    Available phosphoric acid, per cent
    Potash, per cent

How to Calculate the Valuation

The valuation of a fertilizer is calculated by multiplying the composition by the valuation of each unit of plant food and adding the products. A unit is one per cent of a ton, or 20 pounds; so if the valuation of nitrogen is

12 cents a pound, the valuation of a unit is 12 x 20 = $2.40. The valuation of a unit of available phosphoric acid at 6.5 cents a pound would be 6.5 x 20 = $1.30; the valuation for a unit of potash at 6.0 cents per pound would be $1.20. The following is an example of a calculation at the prices given above:

Valuation of 4-8-4 fertilizer

Nitrogen	4 x $2.40 =	$ 9.60
Available phosphoric acid	8 x $1.30 =	$10.40
Potash	4 x $1.20 =	$ 4.80
Total valuation per ton		$24.80

Fertilizer Analyses to be sold in 1939-40

The grades of fertilizer sold in Texas are limited in number. This standardization aids the farmers to become familiar with the different kinds of fertilizer, enables him to decide more readily on the proper kind to be used, enables the agricultural worker to make definite recommendations, and reduces the cost of manufacture and handling, thereby also reducing the cost to the consumer. At a conference with fertilizer manufacturers doing business in Texas, Louisiana, Oklahoma, and Arkansas in July, 1939, grades of mixed fertilizer were adopted for these states. This was the fifteenth such conference for Texas manufacturers, and the seventh joint conference. Changes are made at practically every meeting. Grades which have little sales may be dropped, and new or experimental grades may be added.

The grades adopted for Texas are as follows:

GRADES

0-12-4	4-12-4	6-12-6
3-10-0	5-15-0	10-0-10
3-10-3	5-15-5	10-10-0
4-8-4	6-8-4	10-20-0
4-8-6	6-8-8	10-20-10
4-8-10	6-9-3	11-48-0
4-10-0	6-10-7	15-30-15
		16-20-0

MATERIALS

Activated sludge	Manure salts, 30%
Bat guano	Muriate of potash, 50%
Basic slag	Nitrate of soda, 16%
Bone meal	Nitrate of soda and potash 15-0-14
Calcium nitrate	Sheep manure
Cal-Nitro, 16%	Sulphate of ammonia, 20%
Cal-Nitro, 20%	Sulphate of potash, 48%
Cottonseed meal	Superphosphate, 18%
Cyanamid, 21%	Superphosphate, 20%
Cyanamid, 22%	Superphosphate, 32%
Ground phosphate rock	Superphosphate, 45%
Kainit, 20%	Soft phosphate with colloidal clay
Lawn and Garden	Tankage

Quantity Sold

The quantities of commercial fertilizer sold in Texas for several seasons, from September 1 to August 31, are given in Table 1. These are the actual sales as reported by the manufacturers, and not the tag sales. The tag sales are always a little larger than the actual sales. The sales in 1938-39 were a little higher than last season. The largest sales so far made in Texas were 187,215 tons during the season 1928-29. Fertilizer statistics for a number of years to August 31, 1926, have been published in Bulletin 350, and from 1926 to 1938 in Bulletin 572.

Table 1. Fertilizers sold in Texas, (not including cottonseed meal sold as feed but used as fertilizer).

	Tons
1905-06	13,500
1910-11	52,985
1913-14	77,400
1914-15	17,500
1919-20	56,700
1920-21	14,850
1921-22	33,000
1922-23	73,300
1923-24	126,179
1924-25	97,719
1925-26	121,747
1926-27	79,863
1927-28	139,126
1928-29	187,215
1930-31	64,424
1932-33	30,843
1933-34	47,204
1934-35	59,480
1935-36	60,016
1936-37	84,936
1937-38	79,640
1938-39	93,115

Quantity of Sales by Grades

Table 2 contains the sales of fertilizer by grades for four seasons arranged in order according to sales in the season 1938-39. Sales of 4-8-4 fertilizer are highest of all. The 4-12-4 comes second, the 4-8-6 comes third and the 6-8-4 comes fourth. These are approximately in the same order as they were last year.

Table 2. Fertilizer sales by grades in order of tonnage for 1938-39

	1938-39 In tons	1937-38 In tons	1936-37 In tons	1935-36 In tons
4-8-4	24,171	18,743	23,702	12,118
4-12-4	11,675	10,345	12,433	8,698
4-8-6	9,402	8,107	8,758	6,995
6-8-4	5,661	4,597	2,920	0
6-10-7	4,708	4,901	4,671	5,109
6-12-6	3,846	3,643	3,664	4,029
4-10-0	3,827	2,137	2,132	2,040
Superphosphate, 20%	3,537	3,377	2,642	2,517
3-10-3	3,345	2,961	4,150	3,500
Superphosphate, 18%	2,986	3,516	2,743	3,408
Sulphate of ammonia	2,283	2,548	1,610	1,588
11-48-0	1,905	1,585	1,361	773
3-10-0	1,834	826	1,220	696
Bone meal	1,604	1,342	1,095	1,283
6-9-3	1,373	1,055	1,221	751
16-20-0	1,338	1,606	1,637	692
Nitrate of soda, 15% and 16%	1,098	1,048	1,314	1,080
Lawn and garden fertilizer	1,020	957	157	131
Cyanamid	917	919	1,475	569
Superphosphate, 32%	898	678	538	328
6-8-8	882	0	0	0
4-8-10	862	678	589	297
5-15-5	794	1,525	1,133	923
4-10-7	608	591	814	649
Calcium nitrate	320	0	0	30
10-20-10	275	311	246	245
Superphosphate, 45%	265	150	65	93
Tankage, bat guano, and activated sludge	214	134	295	305
10-10-0	213	110	91	57
5-15-0	204	216	236	67
Cottonseed meal	179	158	25	100
Muriate of potash, 50%	165	207	142	151
Kainit, 20%	156	179	195	222
10-0-10	144	106	108	108
Soft phosphate with colloidal clay	119	40	138	27
0-12-4	114	247	94	115
Urea meal, 20% N	82	0	0	0
Sulphate of potash, 48%	29	44	169	14
Manganese sulphate	21	0	0	0
Sheep manure	15	16	0	0
10-20-0	8	14	0	0
Manure salts, 30%	7	5	9	9
Magnesium sulphate	3	5	0	0
Urea, 40% N	4	0	0	0
Nitrate of soda and potash 14-0-15	3	0	0	0
6-30-0	1	3	0	0
Basic slag	0	10	0	10
0-15-6	0	0	54	54
9-18-18	0	0	952	41
9-27-9	0	0	118	49
Miscellaneous unmixed fertilizer	0	0	17	0
8-24-8	0	0	0	77
6-18-6	0	0	0	44
Total	93,115	79,640	84,938	60,016

Quantity of Cottonseed Meal Used as a Fertilizer

The tonnage of cottonseed meal reported in Table 2 includes only that tagged with fertilizer tax tags and sold as a fertilizer.

Composition and Selling Prices of Different Grades of Fertilizer

Table 3 contains the average composition, the guaranteed valuation, the valuation found by analysis, and the average retail selling prices per ton, of various grades of fertilizers. The average retail selling price is the average of the cash retail prices furnished to the fertilizer inspector by the dealers. The prices of the same fertilizer may be different in different towns on account of differences in cost of transportation or for other causes. The retail price includes handling costs, carrying charges, and the dealer's profits, as well as the cost of the plant food used in the materials from which the fertilizer is made.

The average valuations found (Table 3) exceeds the guaranteed valuations in almost every case. The exceptions are 5-15-0, 5-15-5, 6-8-8, 10-20-0, 10-20-10, and 16-20-0. In all of these, however, the valuations found are only slightly below the valuations guaranteed.

Table 3. Average composition, valuation and selling prices of grades of fertilizer. 1938-39

Grades	Number averaged	Nitrogen per cent	Available Phos. Acid per cent	Potash per cent	Guaranteed Valuation per ton	Valuation found per ton	Selling price per ton
0-12-4	4	.....	11.98	4.19	$20.40	$20.57	$24.40
3-10-0	6	3.09	10.43	.....	20.20	20.97	25.64
3-10-3	64	3.25	10.06	3.37	23.80	24.91	28.04
4-8-4	262	4.08	8.22	4.16	24.80	25.49	29.10
4-8-6	167	4.11	8.12	6.05	27.20	27.69	31.13
4-8-10	20	4.11	8.14	9.78	32.00	32.17	33.64
4-10-0	26	4.11	10.39	.....	22.60	23.37	27.58
4-10-7	10	4.00	10.15	7.43	31.00	31.70	33.54
4-12-4	188	4.20	11.88	4.18	30.00	30.55	32.21
5-15-0	2	4.99	13.88	.....	31.50	30.02	.....
5-15-5	21	5.03	14.73	5.08	37.50	37.25	38.44
6-8-4	64	5.97	8.10	4.13	29.60	29.86	33.32
6-8-8	15	5.96	8.01	7.76	34.40	34.02	35.98
6-9-3	22	6.07	9.03	3.26	29.70	30.22	33.00
6-10-7	129	6.13	10.03	6.90	35.80	36.03	37.07
6-12-6	89	6.09	11.89	6.19	37.20	37.51	37.04
10-0-10	2	10.85	.....	10.38	36.00	38.48	39.00
10-10-0	4	9.96	10.54	.....	37.00	37.60	38.90
10-20-0	1	9.90	18.65	.....	50.00	48.01	.....
10-20-10	9	9.47	18.59	9.46	62.00	58.22	58.48
11-48-0	5	11.49	47.56	.....	88.80	89.40	63.00
16-20-0	13	15.62	20.00	.....	64.40	63.48	53.42
15% Calcium Nitrate	2	15.82	.....	.....	36.00	37.96	42.60
20% Kainit	2	.....	.....	20.57	24.00	24.68	27.30
Muriate of Potash—50%	1	.....	.....	50.58	60.00	60.70	37.00
Nitrate of Soda—16%	2	16.54	.....	.....	38.40	39.70	.....
20% Sulphate of Ammonia	4	20.62	.....	.....	48.00	49.48	43.60
18% Superphosphate	21	.....	18.23	.....	23.40	23.70	23.65
20% Superphosphate	26	.....	20.26	.....	26.00	26.34	25.14
32% Superphosphate	5	.....	32.09	.....	41.60	41.72	41.70
21% Cyanamid, granular	4	21.15	.....	.....	50.40	50.76	41.00
Soft Phosphate with Colloidal Clay	1	.....	21.59*	.....	6.60	6.48	18.00
Raw Bone Meal	1	4.80	22.30*	.....	26.48	29.36	25.00
Pulverized Sheep Manure	1	1.84	2.01	3.43	8.50	11.15	55.00

*Total Phosphoric Acid.

Cost of Plant Food

Table 4 contains the calculated retail cost of a pound of nitrogen, of available phosphoric acid, and of potash, in cents per pound, as calculated from the cash selling prices per ton given in Table 3 and the guaranteed composition. For the purpose of these calculations it was assumed that the prices were in the same ratio as the valuations. As the prices of the same fertilizer in different places vary, these figures are not correct for any particular locality, but represent averages only, and are for purposes of comparison. The prices were collected by the inspectors from retail merchants handling fertilizer. Grades used extensively near the factories would average a lower price than those used at a distance on account of lower transportation costs. The fertilizers with the lowest prices of plant food are given first in the table.

Fertilizers for lawns, gardens and flowers can be secured at a reasonable price but a few of the fertilizers in small packages are sold at a price of hundreds or even thousands of dollars per ton. The cost can be easily estimated from the price and the weight of fertilizer in the package.

Table 4. Approximate average cost of plant food in cents per pounds, arranged in order of increasing cost 1938-39.

Grade	Nitrogen	Available Phosphoric Acid	Potash
Muriate of Potash 50%	.....	.....	3.70
11-48-0	8.51	4.61	.....
Cyanamid 21%	9.76	.....	.....
16-20-0	9.96	5.40	.....
Sulphate of Ammonia 20%	10.90	.....	.....
10-20-10	11.32	6.13	5.66
Raw Bone Meal	11.33	3.78*	.....
20% Superphosphate	.....	6.29	.....
6-12-6	11.95	6.47	5.98
32% Superphosphate	.....	6.51	.....
18% Superphosphate	.....	6.58	.....
5-15-5	12.30	6.66	6.15
6-10-7	12.42	6.73	6.21
6-8-8	12.55	6.80	6.28
4-8-10	12.61	6.83	6.31
10-10-0	12.61	6.83	.....
4-12-4	12.89	6.98	6.44
4-10-7	12.98	7.03	6.49
10-0-10	13.00	.....	6.50
6-9-3	13.33	7.22	6.67
6-8-4	13.51	7.32	6.76
Kainit 20%	.....	.....	6.83
4-8-6	13.73	7.44	6.86
4-8-4	14.08	7.63	7.04
3-10-3	14.14	7.66	7.07
Calcium Nitrate 15%	14.20	.....	.....
0-12-4	.....	7.77	7.18
4-10-0	14.64	7.93	.....
3-10-0	15.23	8.25	.....
Sheep Manure	77.65	42.06	38.83

*Total Phosphoric Acid.

Cost of nitrogen. The 11-48-0 was the cheapest source of nitrogen, cyanamid was next, 16-20-0 third, sulphate of ammonia came fourth and 10-20-10 fifth. Pulverized sheep manure was the most expensive source of nitrogen, 3-10-0 next, followed by 4-10-0 and calcium nitrate fertilizer. Nitrogen cost more in most of the mixed fertilizers than in sulphate of ammonia or cyanamid because it costs to mix the fertilizers. The lowest-priced nitrogen in the mixed fertilizer was in the 11-48-0, followed in order by the 16-20-0, 10-20-10, 6-12-6, and 5-15-5. The 4-8-4, the most popular fertilizer, was also high in price. Nitrogen was lower in price than last season in some fertilizers and higher in others. The difference averaged .20 cents a pound less for nitrogen in sulphate of ammonia, 1.23 cents less for that in 3-10-3, 1.40 cents less for that in 4-12-4, and 1.02 cents per pound less this year in 4-8-4.

Cost of phosphoric acid. The cheapest source of phosphoric acid was 11-48-0, then 16-20-0, followed by 10-20-10 and then 20% superphosphate. The cost of available phosphoric acid was about 0.29 cents less per pound in 20 per cent superphosphate than in 18 per cent. Omitting the household fertilizers, phosphoric acid was most expensive in pulverized sheep manure, then in 3-10-0, and then 4-10-0, and 0-12-4. Available phosphoric acid was 0.08 cents a pound higher in 4-8-4 than it was last season, and 0.17 cents a pound lower in 4-12-4 than last year.

Cost of potash. Muriate of potash was the cheapest form of potash, followed by 10-20-10 and then 6-12-6. Pulverized sheep manure the most expensive in mixed fertilizers, followed by 0-12-4 and then 3-10-3. Potash cost 1.30 cents a pound less in muriate of potash, than it did last season, but 0.12 cents a pound more in 4-8-4, and .11 cents a pound less in 4-12-4.

Relation of Cost to Concentration of Fertilizers

Certain fertilizers are sold which contain the plant food in the same ratio so that, so far as nitrogen, phosphoric acid and potash are concerned, they are the same fertilizer except in concentration, or strength.

The ratio of plant food in the 4-12-4 and 5-15-5 fertilizers is exactly the same, as the proportions are three parts phosphoric acid to one of nitrogen and one of potash. The 3-10-3 fertilizer has practically the ratio 1-3-1. Table 5 shows the approximate cost of nearly equal quantities of plant food in these fertilizers at the average prices given in Table 3. One ton of 6-12-6 costs $6.61 less than an equal quantity of plant food in 1½ tons of 4-8-4. The plant food in 1.25 tons of 4-12-4 costs $1.79 more than an equal quantity in 5-15-5. The 1.67 tons of 3-10-3 cost $3.30 more than the 1.0 tons of 5-15-5, but when an allowance of $2.27 is made of the 33 pounds more phosphoric acid it contains, the plant food in 3-10-3 costs $1.03 more. Similar differences are to be seen with the other grades. The most concentrated mixed fertilizer was the cheapest per pound of plant food, or to put it another way, the highest-priced fertilizer per ton may be the lowest

Table 5. Relative cost of approximately the same amount of plant food in different grades of fertilizer.

Grade	Nitrogen pounds	Available phosphoric acid pounds	Potash pounds	Total Cost
Group 1				
1.0 tons 6-12-6	120	240	120	$37.04
1.5 tons 4-8-4	120	240	120	43.65
Group 2				
1.0 tons 5-15-5	100	300	100	38.44
1.25 tons 4-12-4	100	300	100	40.23
1.67 tons 3-10-3	100	333	100	42.74

priced per pound of plant food. This difference is caused partly by freight charges, partly by the cost of bagging, etc. The higher cost of manufacture of the more concentrated fertilizers is frequently more than offset by the cost of freight, bags, etc. As shown in Table 4, the cost of phosphoric acid averaged slightly less in 20 per cent superphosphate than in 18 per cent.

Comparing Cost of Fertilizer

The relative money value of two or more kinds of fertilizer may be roughly compared by dividing the price at which the fertilizer is sold per ton by the valuation per ton of the fertilizer. Guaranteed valuations for many grades for the season of 1938-39 may be somewhat different, these calculations may be used for comparative purposes. For example, if a 4-8-4 fertilizer sells for $29.00 a ton and a 6-12-6 fertilizer for $37.20, which is cheaper? Using the valuations from Table 3, for 4-8-4, the selling price $29.00 divided by the valuation $24.80 gives $1.17; for 6-12-6, the selling price $37.00 divided by the valuation $37.20 gives $1.00. Thus one dollar of valuation costs $1.17 in 4-8-4, and $1.00 in 6-12-6. Therefore, the 6-12-6 is cheaper. Similar calculations may be made for other grades and for other prices.

Of course the suitability of the fertilizer to the soil and crop must be considered in addition to the relative cost of the plant food.

Free Analyses

Purchasers of commercial fertilizers for their own use (but not for sale), can secure a free analysis of a sample provided they take a legal sample. Those who desire the free analysis of a sample of commercial fertilizer should write for a blank, "Application for Free Fertilizer Analysis," to the State Chemist, College Station, Texas, before taking a sample. The proper sampling of a fertilizer requires care and the law requires it to be taken in a certain way so that a fair sample is taken. If the sample is not properly taken, it does not represent the fertilizer sampled, and the analysis may be

better or poorer than the goods actually are. This privilege of a free analysis applies only to fertilizers tagged, and sold under the fertilizer law and to samples properly taken so that they represent the goods sampled.

Analysis of fertilizers, 1938-39

Samples of fertilizers were collected from the grades being sold in many towns and cities. The chief places of sales were visited several times. The number of samples registered for analysis was 1,208.

Table 8, near the end of this Bulletin, contains a list of the samples of fertilizer subjected to analysis in the season ending September 1, 1939. Analyses below guarantee are brought out in heavy type. Practically all samples of fertilizer were collected by our inspectors. Analyses and inspection were made by S. E. Asbury, T. L. Ogier, Waldo Walker, J. L. Kelch, Geo. Smith, Sam Greenberg, and Leon Miller.

Relation of Valuation Guaranteed to Valuation Delivered

Table 6 contains the average guaranteed valuation, and the average valuation found by our analyses, for all manufacturers doing business in Texas. In the preparation of this table, all analyses made were averaged, even though several were made of each brand and fertilizer materials are included as well as mixed fertilizers.

Averages Below Guarantee

Whenever any lot of fertilizer is 4 per cent or more below guarantee, the law requires all persons who have sold this lot of fertilizer to make good the deficiency to all purchasers. This rebate is paid by the manufacturer to the dealer and by the dealer to the customer. The number of lots on which rebates were paid by each manufacturer is shown in Table 6.

Non-Acid Forming Fertilizers

Ordinary fertilizers are acid forming, and when used for a number of years on soils with a low buffer capacity may make a soil acid, or more acid, if it was already acid to start with. Non-acid forming fertilizers are made by the use of proper amounts of ground dolomite, which is calcium and magnesium carbonate, or by the selection of suitable fertilizing ingredients. Limestone is not suitable because it reverts the available phosphoric acid and causes it to become insoluble. In the eastern part of the United States, where fertilizers have been used for a long time and where the soils are already acid, ordinary fertilizers may not give as good results in crop yields as non-acid forming fertilizers. Non-acid forming fertilizers are recommended for use on acid soils which are likely to become still more acid with ordinary fertilizers. Since Texas soils are generally only slightly

Table 6. Average valuation of all fertilizers guaranteed and found in dollars per ton 1938-39

	Number Averaged	No. of samples more than 4% below guarantee	Valuations	
			Guarantee	Found
American Cyanamid Company	14	0	$55.74	$56.40
Arkansas Fertilizer Company	3	0	26.40	27.06
Armour Fertilizer Works	127	3	31.63	32.06
The Barrett Company	1	0	38.40	39.43
Bryan Cotton Oil & Fertilizer Company	17	0	28.25	31.51
Campbell Fertilizer Company	29	1	29.48	30.85
Chilean Nitrate Sales Corporation	1	0	38.40	39.96
Consolidated Chemical Industries, Inc.	1	0	26.48	29.36
Crockett Fertilizer Works	14	2	29.33	28.96
The Davison Chemical Corporation	2	0	27.40	27.62
Dixie Chemical Company	2	0	26.00	27.76
East Texas Cotton Oil Co.	68	2	28.93	29.36
Farmers Cotton Oil Company	10	0	28.14	29.56
Federal Chemical Company, Inc.	52	0	27.55	28.38
Fidelity Chemical Corp.	89	5	32.52	32.73
Ford Motor Company	3	0	49.92	50.13
Gate City Fertilizer Co.	1	0	24.80	24.11
Gilmer Cotton Oil & Fertz. Co.	18	0	29.91	30.39
Houston Packing Company	4	0	24.59	28.57
International Agricultural Corporation	48	3	28.81	28.60
Jacksonville Fertilizer Co.	13	0	30.82	32.33
Kelly, Weber & Company, Inc.	12	2	27.30	26.94
Longview Cotton Oil Co.	13	1	29.12	29.39
Marshall Cotton Oil Co.	22	1	29.14	28.95
Mixson Brothers	12	0	31.52	32.40
Nicholson's Seed Store	2	0	33.30	34.32
Oil Mill & Fertilizer Works	9	1	27.53	27.63
Pate Bros. Fertilizer Works	18	0	26.91	28.24
Pittsburg Cotton Oil Co.	15	2	28.20	27.90
Port Fertilizer Co.	13	1	57.90	58.13
The Pulverized Manure Co.	1	0	8.50	11.15
San Benito Feed Co.	1	0	27.20	32.77
Shreveport Fertilizer Works	77	0	29.54	30.62
Soil Builders, Inc.	1	0	6.60	6.48
Swift & Co. Fertz. Works	193	9	30.25	30.22
Synthetic Nitrogen Products Corporation	1	0	36.00	36.48
Temple Cotton Oil Company	14	1	27.26	26.66
Tennessee Corporation	1	0	29.80	30.27
Texas Farm Products Company	101	0	29.19	29.25
Tri-State Fertilizer & Lumber Co., Inc.	9	0	29.53	30.69
Tyler Fertilizer Co.	18	2	29.42	28.92
United Chemical Company	71	2	28.86	29.43
Virginia-Carolina Chemical Corporation	83	0	28.21	29.10
Charles F. Ward	2	0	28.70	39.51

acid, or even alkaline, the use of non-acid forming fertilizers is not at present necessary, except under exceptional conditions. Where the soils are neutral or slightly alkaline, as is the case in large areas of limestone soils, ordinary fertilizers are preferable to non-acid forming fertilizers. Some plants require slightly acid soils for best results. An acid-forming fertilizer may be better on an alkaline soil than a non-acid forming fertilizer. For further information see Progress Report No. 594.

Only two brands of fertilizer sold in Texas this season were claimed to be non-acid forming. Examination was made of 24 samples, with the results given in Table 7.

Table 7. Analyses of fertilizers claimed to be non-acid forming

Laboratory Number	Name of Brand	Acid-Base Balance. Pounds of calcium carbonate per ton.	Character
53490	Swift's PH7 6-8-4	36B	Passed
53584	Swift's PH7 6-8-4	0A	Passed
53585	Swift's K.O. Non-acid forming 6-8-8	15B	Passed
53623	Swift's K.O. Non-acid forming 6-8-8	11B	Passed
53631	Swift's PH7 6-8-4	12A	Passed
53651	Swift's PH7 6-8-4	30A	Passed
53658	Swift's PH7 6-8-4	12B	Passed
53722	Swift's PH7 6-8-4	6B	Passed
53727	Swift's K.O. Non-acid forming 6-8-8	4A	Passed
53735	Swift's PH7 6-8-4	17B	Passed
53771	Swift's PH7 6-8-4	6A	Passed
53809	Swift's PH7 6-8-4	40A	Passed
53836	Swift's PH7 6-8-4	49A	Passed
53915	Swift's PH7 6-8-4	31A	Passed
53939	Swift's PH7 6-8-4	83A	Sl. acid forming
53954	Swift's PH7 6-8-4	25A	Passed
54025	Swift's K.O. Non-acid forming 6-8-8	8A	Passed
54035	Swift's K.O. Non-acid forming 6-8-8	13A	Passed
54044	Swift's K.O. Non-acid forming 6-8-8	20A	Passed
54052	Swift's PH7 6-8-4	41A	Passed
54061	Swift's PH7 6-8-4	47A	Passed
54102	Swift's PH7 6-8-4	44A	Passed
54236	Swift's PH7 6-8-4	60A	Sl. acid forming
54251	Swift's PH7 6-8-4	21A	Passed

Investigations Under the Fertilizer Law

The State Chemist is required by the fertilizer law to investigate the composition, properties, and agricultural values of fertilizers or fertilizer materials, or ingredients of fertilizer sold or offered for sale within the State of Texas, and to publish his results as he may find.

Relation to Experiment Station Work

The work of the State Chemist is closely related to the chemical work of the Experiment Station. In his capacity as Chief of the Division of Chemistry of the Experiment Station, the State Chemist is carrying out extensive investigations into the fundamental properties of soils, especially with respect to their content of plant food. This work is related closely to the use of fertilizers and is connected with investigations as to the agricultural values of fertilizers required by the Fertilizer Control, for fertilizers vary in effect upon the different soils.

Soft Phosphate With Colloidal Clay

Soft phosphate with colloidal clay is a natural phosphate of lime containing 20 per cent of total phosphoric acid or more. The phosphate of lime is so finely divided that some of it is termed colloidal. The availability to plants of the phosphoric acid of soft phosphate with colloidal clay is on an average about 40 per cent of that of the available phosphoric acid in 20 per cent superphosphate. Additional information is given in Bulletin 509.

Sulphur, Gypsum, Manganese, and Other Secondary Fertilizing Elements

Our present evidence indicates that manganese, magnesia, sulphur, calcium, boron, iodine, zinc or other secondary fertilizing elements do not need special attention as additions to Texas soils. Sulphur, and calcium are present in large quantities in practically all mixed fertilizers, and small quantities of the other elements are also present.

We are unable to recommend the use of sulphur or gypsum alone as a fertilizer in Texas because Texas soils need nitrogen, phosphoric acid or potash much more than they need sulphur, and the sulphur or gypsum does not supply any of these plant foods. The experiments which have been carried out do not give results which justify the use of such materials as fertilizers alone (see Bulletins 408 and 414). This also applies to the natural mixture of sulphur, gypsum, sulphuric acid and other substances, which various parties and concerns have attempted to sell or exploit as a fertilizer or soil amendment. It is not recommended for use as a fertilizer and does not give results on soils which need fertilizer, as shown in Bulletins 408 and 414.

For plants which do best on an acid soil sulphur is sometimes used to acidify soils that are alkaline or neutral. The organisms in the soil oxidize the sulphur to sulphuric acid and thus in turn acidifies the soil. The oxidation requires two or three months. The quantity to be used depends upon the buffer capacity of the soil for acid, and may range from a few hundred pounds to several thousand pounds per acre. In the latter case, acidification of spots is best. The value of a sulphur for acidifying the soil depends on the quantity of sulphur present: a material containing 85 per cent of sulphur is 4¼ times as strong as one containing only 20 per cent of sulphur. Plants suffer from a yellowing of the leaves, known as chlorosis, usually due to deficiency of iron on some limestone soils in Texas. The presence of carbonate of lime prevents the plant from taking up (or utilizing) sufficient iron. Most of these soils contain such large quantities of carbonate of lime that broadcast applications of sulphur are soon neutralized. A sufficient number of acidified spots may prevent the chlorosis. The acidified spots may be made by digging post holes to depths of 2 to 3 feet, mixing the dirt with sulphur and returning the mixture to the holes. Holes may also be made with a pointed iron rod and filled with the sulphur.

Investigations on the use of manganese sulphate for Texas soils are given in Bulletin 432. The results of the experimental work do not justify recommendation of the use of manganese sulphate on Texas soils.

Greensand

A report of investigations regarding the value of greensand as a fertilizer was published in Bulletin 428. The availability of the potash and phosphoric acid in greensand was found to be low. Greensand has little fer-

tilizing value but can be used in quantities of 5 to 40 tons to an acre on land near to the deposits where it can be mined and applied at a cost closely related to its value. It does not contain sufficient fertilizer value to justify attempting to market it.

Polyhalite and Sewage Sludge

Polyhalite, a mineral found in deep deposits in western Texas and in New Mexico, contains about 12 per cent potash, which is only partly soluble in water, but which is readily available to plants. Additional information is given in Bulletin 449.

Digested sewage sludge is low in plant food, and the nitrogen has a low availability. Dried activated sludge contains about 5 per cent nitrogen and 2 per cent available phosphoric acid and the nitrogen has a good availability to plants. Additional information is given in Bulletin 445.

GENERAL CONSIDERATIONS ON THE USE OF FERTILIZERS

Fertilizers supply the three forms of plant food most necessary for growing crops, namely, nitrogen, phosphoric acid, and potash. For best results with fertilizers, other conditions should be favorable, such as a well-drained soil in good physical condition, a well prepared seed bed, good seed, good cultivation, sufficient rainfall or irrigation, and suitable rotation. Nitrogen is the most expensive plant food, and for this reason the amount of fertilizer used generally does not supply all the nitrogen required by the crop. A cropping system which includes the regular growing of suitable legumes, such as clover, cowpeas, soy beans, velvet beans, peanuts, or alfalfa, should be followed for the purpose of securing nitrogen from the air, provided the legume crops can be grown to advantage. A suitable rotation also adds organic matter to the soil, utilizes time and labor to better advantages, aids in controlling insect pests and plant diseases, and has other favorable effects.

The proper fertilizers to use depends upon the kind of soil, the climate, the crop, how long the soil has been in cultivation, whether or not legumes have been turned under or grazed off, what the soil will produce without fertilizer, what the rainfall, temperature and other conditions permit it to produce with fertilizer, and other conditions.

Soils which have been in cultivation a long time, or very sandy soils are usually more deficient in nitrogen than new soils or clay soils. Soils having a rotation which includes legumes need less nitrogen than those cropped constantly to non-legumes.

Clay soils and soils with clay or loam subsoils in cultivation less than 15 years need little potash in Texas for ordinary farm crops, but light sandy soils with sandy subsoils may need potash. Larger amounts of fertilizer

may be profitably used on crops with a high acre value, such as fruit or truck crops, than on ordinary farm crops, such as corn or cotton. The fertilizer on cotton may profitably be twice as much as that used on corn.

Best results are secured by a well-balanced supply of plant food in the soil. An excess of nitrogen or an excess of potash is shown by the production of a heavy stalk or vine, with a deficiency of fruit or delayed maturity. If such land has not been fertilized, probably the best fertilizer to use is 200 to 300 pounds of superphosphate to the acre. This will frequently (but not always) promote fruiting. If a fertilizer has been used, the remedy is to decrease the percentage of nitrogen and to increase the percentage of phosphoric acid in subsequent applications. The percentage of potash may also be decreased.

Excess nitrogen in soil when truck crops are grown may produce rapid growth with soft tissues, which do not stand up well under shipment. Strawberries, for example, produce large fruits which are not firm enough to ship well. Lettuce, cabbage, and similar crops may not be firm enough to stand shipment. Increased quantities of potash will not prevent softness caused by excess of nitrogen.

Excess of nitrogen renders some plants more liable to attack by some diseases. Excess of nitrogen also delays maturity. Excess of potash, like excess of nitrogen, delays maturity of the crop. A well-balanced fertilizer should be selected, due consideration being given to the soil, the crop, the character of growth, and other conditions. A well-balanced fertilizer will produce a crop that is firm and ships well.

How and When to Apply Fertilizer

Fertilizer is generally applied under the seed at the time of planting or previous to planting. It should not touch the seed, but is placed in a narrow band one to three inches below the seed or preferably at the side 2 to 3 inches from the seed or plants and at the same level. A combined planter and fertilizer distributor may be used, but care should be taken to select a machine which applies the fertilizers properly, as some machines are not satisfactory.

Fertilizer may be placed in the ground at the time of planting or not more than three weeks before planting. If applied too early, there is danger of loss of plant food by fixation and leaching.

If more than 800 pounds of fertilizer to the acre are to be used, applications are best made partly in the furrows and partly broadcast. However, with some vegetables it is best to apply all the fertilizer in the furrows. If desired, high analysis fertilizer may be mixed with fine dry sand before it is applied in order to secure a more uniform distribution.

In dry sections, where the soil above the seed is liable to dry out, the fertilizer may be applied on the firm soil at the same depth as the seed but by side of the seed. Sometimes it may be advisable to put it in when the land is bedded, especially on heavy soils where there is little danger of loss by leaching. When fertilizers of high analysis are used, especial care should be taken to mix them with the soil, and not to apply them close to the seed or to the roots of growing plants. These fertilizers are quite strong, and burning or other injury may result if they are placed closely to roots of plants.

Fertilizers in solution are sometimes applied when plants are set out, to plotted plants or in home gardens. A pint of such a solution applied to tomatoes when transplanted has been found to give a considerable increase in yield and to help the plant root. About one ounce of 6-8-4 or 6-12-6 to a gallon of water is used for such solutions, but many fertilizers are not sufficiently soluble in water to be used for such purposes.

How Much to Apply

It is best for farmers not experienced in the use of fertilizer to begin with moderate amounts, such as 200 to 400 pounds to the acre for cotton or corn and 400 to 800 pounds for truck crops. Larger amounts may then be tried on a small scale and then these larger amounts used if these trials appear to justify it .The approximate amounts to use are indicated below. A farmer should be guided by his own experience in the selection and use of fertilizers.

Side Dressings

More than one application of fertilizer is not usually recommended for cotton or corn. Under exceptional conditions, however, more than one application may be made for cotton or corn. These conditions would include: (1) when more than 500 pounds of fertilizer to the acre is to be used; (2) when the plants appear to be suffering from a deficiency of available plant food, particularly nitrogen; (3) if the weather in the spring has been excessively wet, so as to cause considerable leaching; (4) if the soil is a deep sandy soil, where the plant food is likely to leach out. Bulletin No. 490 contains additional information.

Side dressings of cotton with nitrate of soda, sulphate of ammonia, or other sources of nitrogen are not generally to be recommended, but may be used when the fertilizer applied at planting does not contain enough nitrogen, or on deep sandy soil, where there may be considerable loss from leaching. Under such conditions, 100 pounds per acre of nitrate of soda or sulphate of ammonia may be applied to cotton just after chopping.

Corn which was not fertilized before planting may frequently use to advantage a side dressing of nitrate of soda or sulphate of ammonia, applied when the corn is knee-high.

Side dressings are frequently applied to truck crops. In such case a complete fertilizer is applied before or at the time of planting, and one or more side dressings of sulphate of ammonia or nitrate of soda afterwards.

There is little danger of loss of phosphoric acid or potash by leaching, while soluble nitrogen may be lost by leaching.

Fertilizers for East Texas

The soils of East Texas as a general rule respond well to fertilizers, and the recommendations made here apply chiefly to this section of the State. Many of the soils of East Texas are sandy and low in phosphoric acid and nitrogen; they are usually better supplied with potash but sometimes they are low in potash. The heavier soils and the bottom lands are much better supplied with plant food than the upland soils.

Fertilizers for Black Lands

The heavy black limestone soils of Central Texas, especially the Houston clay and the Houston black clay, do not give as much response to fertilizers as the sandy soils of eastern Texas. Sometimes they respond to applications of nitrogen and phosphoric acid, although in general the use of fertilizers on these soils has not been profitable. In some cases they give satisfactory results one year and unsatisfactory the next. These soils appear to need vegetable matter first, such as is supplied by well rotted manure, by legume crops turned under or grazed off, or by winter crops. A rotation is also of advantage (see Bulletin 365). Sandy lands in this section will probably respond to fertilizer, though little has been used on them.

Fertilizers for West Texas

Some of the lighter soils of West Texas are low in phosphoric acid and potash, and fertilizers will probably be needed in this section of the State as time goes on, especially on irrigated soils. In fact, fertilizers have already been used with good results in some sections. Some of the soils of West Texas contain no more plant food than those of East Texas, but the roots of the plants penetrate deeper in dry sections and have more soil to feed upon than in humid sections so that the plant is able to secure more plant food than from the corresponding soil in the Eastern part of the State.

When fertilizers are used in Texas west of the Blackland section, it is suggested that somewhat smaller amounts be tried than is recommended for East Texas, unless the land is irrigated. Also, unless the land is irrigated, care should be taken that the fertilizer is in the firm soil in which the plants grow, not in the loose earth, which is likely to dry out.

Fertilizers for the Rio Grande Valley

The soils of the lower Rio Grande Valley are generally well supplied with plant food, especially with potash. When the soils are new, they may contain an excess of nitrogen, and tend to produce a heavy growth of stalk and leaves, with deficiency of fruit. Superphosphate is perhaps the best fertilizer to use in such soils, where there is reason to believe an abundance of nitrogen is present.

After having been under cultivation several years, these soils are likely to need nitrogen first, as the nitrogen is most readily exhausted. As it is desirable to avoid an excess of nitrogen, moderate quantities of nitrogen should be used at first. These soils are high in potash, and are less likely to need potash than the East Texas soils, which are lower in potash. However, some potash may be used, especially as the cropping is heavy, but there is no need at present for the percentage of potash to exceed the percentage of nitrogen. Crop rotation with plants immune to nemitodes and resistant to root rot is highly important in vegetative production in the Rio Grande valley.

Our suggestion at present for these virgin soils would be then to begin with superphosphate, if the vegetative growth is very heavy. In succeeding years 10-10-0, 16-20-0, 11-48-0 or combinations of these may be used or one of these may be used to begin with if vegetative growth is not excessive. In the course of time, when potash has been depleted by cropping, one would use such fertilizers as 6-12-6, 10-20-10, or 6-10-7.

Fertilizers for the Gulf Coastal Plains

There is considerable variation in the soils of the Gulf Coastal Plains. Some of the soils in the southern section are very sandy, and somewhat low in plant food. These should receive about the same fertilizer as the sandy lands of East Texas. Most of the soils are heavier and better supplied with plant food than the very sandy soils. The fertilizers suggested are the same for the corresponding soils of the Rio Grande Valley. The heavy black soils (The Lake Charles soils) at the Experiment Station at Angleton respond well to superphosphate and to applications of nitrogen and phosphoric acid on cotton and corn.

Some of the soils of the Gulf Coastal Plains are poorly drained. They should be well drained and placed in good condition before any fertilizer is used, since applications of fertilizer will not remedy poor drainage.

FERTILIZERS SUGGESTED FOR THE VARIOUS CROPS

The suggestions given below represent the best present information for the use of fertilizers in Texas, and will be modified from time to time, as more experimental data are accumulated and further practical experience

is secured. Home mixtures can of course be used in place of the factory mixed fertilizers here mentioned.

Grades With the Same Ratios

Where a fertilizer of a given ratio is suggested, a different grade with the same ratio may be used, in such a quantity as to supply an equivalent amount of plant food. Where 4-12-4 is suggested, equivalent amounts of 3-10-3, or 5-15-5, may be used, as these all have the same ratio of plant food, 1-3-1. Where 4-8-4 is suggested, equivalent amounts of 6-12-6, or 10-20-10, may be used, as they have the same ratio of plant food, 1-2-1.

Alfalfa

For soil recently put in alfalfa, use 200 to 400 pounds per acre of superphosphate. For soil in cultivation six years or longer (best to rotate), use 200 to 400 pounds of superphosphate, or 200 to 600 pounds of 0-12-4. Soils poor in lime should receive lime. (Bulletin 242.)

Asparagus

Apply 10 to 20 tons per acre of well-rotted manure and 500 to 800 pounds per acre of a 4-12-4 or 6-12-6 fertilizer when setting out the plants. Manure alone has given good results at both Balmorhea and Iowa Park. If the manure is not available, 600 to 900 pounds per acre of the fertilizer could be used. Every spring apply 400 to 600 pounds of 6-12-6 or 4-8-4. Just before the cutting season is over, or soon after, apply 200 to 400 pounds of 4-8-4 or 6-12-6. Two top dressings of nitrate of soda, 100 pounds per acre each, applied in the spring, would also be advisable in many cases.

Beans (garden) and Peas (garden or English)

An application of 300 to 500 pounds per acre of a 6-10-7 or 6-12-6 fertilizer is suggested, except in the lower Rio Grande Valley, where the use of 150 to 300 pounds per acre of 11-48-0 is suggested.

Beets, Carrots, Turnips, and Radishes

From 300 to 700 pounds per acre of 6-12-6 or 5-15-5 are suggested for East Texas and 16-20-0, 11-48-0, or 5-15-0 for the clay loam soils of the Rio Grande Valley and Gulf Coast.

Broccoli, Cabbage, Cauliflower, Mustard, and Spinach

From 300 to 700 pounds per acre of 6-12-6 or 5-15-5 may be used, supplemented by three top dressings of 50 to 100 pounds of nitrate of soda or sulphate of ammonia or other fertilizer containing only nitrogen, ten days

or two weeks apart, beginning when the plants have begun to make a good growth. Excessive application of nitrogen and too rapid growth will impair the shipping quality.

The nitrate of soda or sulphate of ammonia should be sprinkled along the row, three or four inches from the plants, or applied broadcast after the dew has dried off or applied just before cultivation. In the Rio Grande Valley, 200 to 400 pounds per acre of 16-20-0 or 10-20-0 may be used.

Corn

For loam or clay soils with clay or sandy clay subsoils, such as Susquehanna, Kirvin, Orangeburg, or similar soils, with legume rotations, use 200 to 300 pounds per acre of 4-8-4, 6-8-4, or 4-10-0.

For loam or clay soils with clay or sandy clay subsoils, without legume rotation, in cultivation eleven years or more, use 200 to 300 pounds per acre of 4-8-4, 6-8-4, or 4-10-0.

For deep sandy soil, use 200 to 300 pounds of 4-12-4. This is not a good corn soil.

For land which produces a heavy stalk, but does not fruit well, use 200 pounds of 20 per cent superphosphate.

For black waxy land (Houston black clay), or heavy limestone land of Central Texas, a systematic rotation is needed first. Fertilizers are uncertain. A trial may be made of 200 to 400 pounds per acre of 4-10-0 or 100 pounds of 16-20-0.

Side dressing: Corn may frequently use to advantage a side dressing of 100 pounds or more of nitrate of soda, sulphate of ammonia, or other soluble nitrate, applied at the side of the rows when the corn is knee high, especially when unfertilized corn follows crops that were previously well fertilized, or when a fertilizer low in nitrogen is used.

Land fertilized the previous season: Where corn follows cotton that has been well fertilized the previous season, for example with a 4-8-4, or 4-12-4 fertilizer at the rate of 300 to 400 pounds or more per acre, apply 100 pounds of nitrate of soda, sulphate of ammonia, or a synthetic nitrogen product before planting or as a side dressing when the corn is 12 to 24 inches high.

Corn

Although corn responds to applications of fertilizers on most of the soils in the eastern part of the state, according to the Division of Agronomy of this Experiment Station, usually the use of fertilizers on corn has not been profitable perhaps because corn has a low value per acre. Where, however,

corn follows a well-fertilized crop, as cotton, tomatoes, or potatoes, the use of 100 pounds per acre of nitrate of soda or sulphate of ammonia has given good results.

Cotton

The sandy soils in the eastern and northeastern parts of the state generally need a complete fertilizer for cotton, according to the results of field experiments conducted by the Division of Agronomy. On the sandy loam soils with clay or sandy clay subsoils, such as the Kirvin, Bowie, Nacogdoches and similar soils, the use of 300 to 400 pounds per acre of a 4-8-4, 6-8-4, or 6-10-7 fertilizer or a fertilizer such as 6-12-6 with similar ratios and amounts of plant food is recommended. (See Bulletin 469.)

The Lufkin soils, which have heavy, plastic clay subsoils, need a fertilizer with a high proportion of phosphate. According to the results obtained in the Division of Agronomy on the Lufkin fine sandy loam at College Station, the application of 300 to 400 pounds of a 4-12-4 fertilizer or a fertilizer supplying equivalent amounts and ratios of plant food is recommended.

The dark colored prairie soils in the humid part of the Gulf Coast Prairie, consisting largely of the Lake Charles soils, are first in need of phosphate and then in nitrogen. Field experiments on the Lake Charles clay loam at Angleton have shown that use of 300 to 600 pounds per acre of a 4-8-4 or 6-10-7 fertilizer is good fertilizer practice for cotton on this soil. Fertilizers with similar ratios such as 6-12-6 may be used. Moderate amounts of fertilizer without potash as 4-10-0 and 16-20-0 also should give good results.

Although experiments with fertilizers on cotton throughout the Blackland Prairie have shown some response to applications of nitrogen and phosphate, fertilizers in general have not been profitable on these soils. Those who wish to try fertilizers could use 200 to 300 pounds per acre of 4-10-0 or 6-8-4 or 100 to 200 pounds of 16-20-0. (Recommendations by Dr. Reynolds.)

On land which produces an excessive stalk, and does not fruit well, which is chiefly bottom land, from 200 to 400 pounds of 18 per cent or 20 per cent superphosphate may be used. Nitrate of soda, sulphate of ammonia, or other nitrogenous fertilizer applied early at the rate of 100 to 200 pounds per acre sometimes give good results on bottom lands which produce a moderately sized stalk.

In the Rio Grande Valley, 200 to 300 pounds of 16-20-0 or 10-20-0 may be tried. In regions where the rainfall is sufficient, cotton may use to advantage a top dressing of 100 pounds of nitrate of soda, sulphate of ammonia, applied along the rows at the time of chopping provided that the soil is well supplied with phosphoric acid and potash, either naturally or by use of a fertilizer low in nitrogen but containing phosphate and potash.

Cantaloupes, Cucumbers, Squash, or Watermelons

On sandy loam soils, 200 to 500 pounds per acre of 4-12-4 or 6-12-6 or 4-8-6 may be used. In southwest Texas, 300 to 400 pounds of 10-20-10 is suggested. An excess of nitrogen will produce a heavy growth of vine, but a deficiency of fruit. The remedy is to use more phosphoric acid or less nitrogen. Well-rotted manure should always be used with melons, if possible.

Eggplant, Okra, and Peppers

An application of 300 to 700 pounds per acre of 6-12-6 or 4-8-6 is suggested for trial. In the Rio Grande Valley, 200 to 300 pounds of 16-20-0 or 10-20-0 or 10-20-10 may be tried.

Figs

Recommendations for fertilizers for figs depend upon the nature of the soil and the size of the trees. On the heavy black prairie soils at Angleton, phosphoric acid gave a slight increase in yield, while nitrogen and potash gave no appreciable increase in yield of figs. An application of 200 pounds per acre of superphosphate is suggested for such soils. Figs seem to do best on a soil containing lime.

For small trees on heavy black soil, 200 to 300 pounds to the acre of 4-10-0 is suggested. As the trees grow larger, the quantity of fertilizer may be increased to 600 to 1,000 pounds to the acre, or a 16-20-0 fertilizer may be used in smaller amounts.

The fertilizer should be applied in the spring after danger of frost is past, and harrowed in. Weeds should be kept down, especially around young trees; otherwise, the fertilizer may help weeds to grow and thereby hold back the trees. Where a heavy crop of winter clover is turned under, the amount of nitrogen needed in commercial fertilizers is low.

Grapefruit or Orange Trees

According to Bulletin 145 of the California Agricultural Experiment Station, nitrogen is the chief plant food needed in California, and is best supplied in well-rotted manure. A 16-20-0, 10-10-0, or 11-48-0 fertilizer may be used on Lower Valley soils, which are high in potash, sulphate of ammonia, nitrate of soda, or other nitrogenous fertilizer alone may be used. On soils low in potash, a 10-20-10 may be desirable. Bearing trees ten years old may each receive 10 to 20 pounds of fertilizer per tree each year.

The soils on which citrus fruit are grown in Texas are generally higher in potash than in either phosphoric acid or nitrogen, and there appears no good reason at present to recommend fertilizers high in potash for most of these soils.

Onions

The use of 600 to 1,200 pounds per acre of 6-12-6, 6-8-4, 5-15-5, or 6-10-7 is suggested. Under irrigation, the 6-12-6 fertilizer may be used at rates varying from 600 to 900 pounds per acre except on new land, when 1,200 pounds per acre may be used. On some soils, especially in the heavier soil in the Winter Garden District, potash is not needed and 300 to 700 pounds per acre of 5-15-0 or 16-20-0 fertilizer may be used. (See Bulletin 524 and 561.) Superphosphate alone at the rate of 300 to 400 pounds per acre is used on good land.

Peach or Plum Trees

For loam soils with clay or sandy clay subsoils, such as Orangeburg, Susquehanna, or similar types, use 200 to 600 pounds per acre of 4-10-0 or 4-12-4. The fertilizer may also be applied to individual trees at the rate of 1 pound per inch of diameter of the tree at the beginning of the growing season. When the trees are bearing, use, in addition, 200 pounds or more of 10-10-0, increasing the quantity as the trees grow older. According to experiments made in other states and observations on commercial orchards in Texas, nitrogen is the only element needed for complete crops of peaches. Nitrogen can be supplied by cyanamid or other nitrogenous fertilizers.

For deep sandy soil, such as Norfolk sand, use 200 to 600 pounds of 4-12-4 or 4-8-4.

Clay soils and bottom lands: Use 200 to 600 pounds of 4-10-0.

Potatoes, Sweet

Loam or sandy loam soils with clay or sandy loam subsoils: 300 to 600 pounds per acre of 4-12-4 or 6-12-6 may be used. Deep sandy soil: Use 200 to 500 pounds of 6-12-6 or 6-10-7. Excess of nitrogen will produce excessive growth of vine and deficiency of tubers. The use of manure is desirable in growing sweet potatoes, but heavy applications of barnyard manure produce conditions favorable for disease.

Potatoes, Irish

On loam or sandy soils, 300 to 700 pounds per acre of 6-12-6 or 4-12-4 or 4-8-6 is suggested. In East Texas 500 to 800 pounds of 4-8-4 or 6-8-4 may be used. In the Rio Grande Valley, 16-20-0 or 11-48-0 may give good results when used at the rate of 200 to 300 pounds per acre. On some soils, a 10-20-10 is needed.

Rice

Experiments conducted in the Beaumont Substation from 1915 to 1928 show that 100 pounds to the acre of sulphate of ammonia made the largest increase in yield and has been the most profitable treatment used (see Bulletin 398, Fertilizers for Rice in Texas). Since 1935 experiments show that 100 pounds of sulphate of ammonia plus 100 pounds of 20% superphosphate drilled in with seed gave decided increases in yield. An application of 100 pounds to the acre on new land and up to 200 pounds on old land is recommended. On some rice soils, 200 pounds per acre of 6-12-6 may be tried.

Sorghum

An application of 200 to 300 pounds per acre of 4-8-4, 6-8-4, or 4-10-0 is suggested. In the Rio Grande Valley, sometimes an application of 200 or more pounds per acre of cyanamid is applied when sorghum residues are turned under in the fall, to hasten decomposition of the residue and to fertilize the succeeding crop.

Strawberries

An application of 400 to 600 pounds per acre of 4-8-4, 4-12-4, or 6-12-6 may be made at the same time of setting out the plants. In the spring, just before blossoming, an early application of the same fertilizer should be used in about the same quantity, put as near the row as convenient, and worked into the soil lightly. Another application in the fall is also desirable, to stimulate the growth of the plants in the cold season. Side dressings have not been found effective in the Winter Garden District of Southwestern Texas. One-half ounce of superphosphate applied on the roots at planting time has been found to be beneficial in the Rio Grande Valley and green or animal manures seem to be needed by strawberries.

Tomatoes

Loam soils with clay or sandy clay subsoils of East Texas, such as the Ruston, Kirvin, or Nacogdoches: If 400 to 600 pounds per acre is used, use 4-8-6 or 6-12-6; if 500 to 1,000 pounds, use 4-8-6, 4-8-4, 4-12-4 or 6-8-4. Less than 500 pounds of fertilizer may be supplemented by 100 to 200 pounds of nitrate of soda or sulphate of ammonia if there is no tendency to excessive growth of vine.

Deep sandy soil, such as Norfolk sand: If 200 to 500 pounds per acre is used, use 4-8-6, or 4-8-4; if 500 to 1,000 pounds is used, use 6-8-4. Less than 500 pounds of fertilizer may be supplemented by 100 to 200 pounds of nitrate of soda or sulphate of ammonia if there is no tendency to excessive growth of vine.

Winter Garden and Rio Grande Valley: Superphosphate alone at the rate of 300 to 500 pounds per acre has been found to give good results. The 16-20-0, 5-15-0, or 11-48-0 fertilizer at the rate of 200 to 400 pounds per acre or 11-48-0 at the rate of 150 to 250 pounds per acre is used by many valley growers.

Land which produces an excessive vine: Use 200 to 400 pounds of superphosphate, 18 per cent or 20 per cent. Vines which grow large and do not fruit may sometimes be caused to fruit well without fertilizer if the vines are properly pruned. According to New Hampshire Bulletin 28, excess of potash delays maturity of tomatoes, and phosphoric acid hastens maturity.

Home Gardens and Flowers

Home gardens frequently receive large quantities of manure, with little or no applications of phosphoric acid or potash. This results in unbalanced condition of the plant food in the soil, resulting in excessive growth of leaves and stems and insufficient fruit or flowers. The best fertilizer to apply when heavy applications of manure have been made would be 200 to 400 pounds per acre of superphosphate, or 0-12-4 fertilizer. If the rows are 2 feet apart, one pound to 50 feet of row is equal to about 400 pounds fertilizer per acre.

Where applications of manure have been made only in moderate amounts, 4-12-4 or 6-12-6 would probably be satisfactory at the rate of about 2 pounds to 50 feet of row. If light applications of manure are made, or none at all, 4-8-4, 6-12-6, or 4-8-6 at the rate of 1½ to 3 pounds to 50 feet of row would be suggested, and top dressings with nitrate of soda or sulphate of ammonia at the rate of ½ pound to 50 feet of row might also be tried. The fertilizer is best placed in furrow in a narrow band about two inches from the seed or plants and on the same level or a little below. If placed in direct contact with either seed or plants or too near to them, it may cause injury. One pound of the fertilizer may be broadcast on an area of 25 square feet, that is, 5 feet long and 5 feet wide, and worked into the soil, for flowers, or vegetable gardens. Two teaspoonfuls to the quart of soil may be used for potting soil. For potted plants, one teaspoonful for each quart of soil may be put around just inside the rim of the pot, and thoroughly watered, every month. Too much fertilizer will injure the plants. Plants may be watered with a solution of 1 teaspoonful (heaping) of fertilizer to a quart of water.

Shade Trees and Ornamental Shrubs

Shade trees and ornamental shrubs are probably benefited by fertilizer, but few fertilizer experiments have been made on such plants. The fertilizer should be added in such a way as to aid in developing the deep roots. Plants with surface roots extensively developed are likely to suffer from insufficient water in dry weather, or even to die. Where serious drouths

occur, the development of deep-feeding roots by trees and shrubs is exceedingly important. If a complete fertilizer is used, it is well to put it down in holes 15 to 20 inches deep or deeper. The holes may be punched with a pointed iron bar ½ to ¾ inches in diameter and 24 inches long, with a bar about 12 inches long welded across the top to serve as a handle. Four holes, about one foot from the plant are sufficient for rose bushes or similar plants. The fertilizer for trees should be distributed in 15 to 24 holes around in a circle a little larger than the spread of the branches. The holes should be completely filled with the fertilizer. For large trees, more holes should be punched and filled with the fertilizer. Manure may be put down in the same way, but the holes must be larger. Sulphate of ammonia, nitrate of soda, or some other nitrogenous fertilizer, or a complete mixed fertilizer such as a 4-12-4, 6-12-6, or 4-8-4, may be used at the rate of about one-half pound for each inch in diameter of the tree or shrub. Sulphate of ammonia would probably be best on limestone soils or basic soils, such as those of the blackland prairie region, and west or south of it. East of the blacklands, especially on the sandy soils, a complete mixed fertilizer would probably be best, though a nitrogenous fertilizer might be sufficient.

Some varieties of roses and some broad leaved evergreens such as Camellias and Azaleas do best in an acid soil, and do poorly in alkaline soils. Such soils need acidification by applications of sulphur.

Lawns

An application of either sulphate of ammonia, cottonseed meal, 4-12-4 or 4-8-4 fertilizer at the rate of one to 2 pounds per hundred square feet is suggested. The fertilizer should be applied in the spring evenly, when the grass is dry, and then wet down thoroughly with the hose. If the grass is wet when the fertilizer is applied, the fertilizer will stick to it and probably burn it. The fertilizer can be applied broadcast by hand but it is more readily applied by a special distributor, which runs as easily as a lawnmower. If the soil is sandy or deficient in humus, an application of dried sheep or goat manure or well-rotted barnyard manure is suggested at the rate of 100 pounds to 100 square feet. This manure should be applied in the late fall or early spring.

SUMMARY

This Bulletin contains a report of the Texas Fertilizer Control for 1938-39 and definitions of fertilizer terms as adopted by Association of Official Agricultural Chemists.

An explanation of terms is given.

Sales of fertilizer in Texas were 93,115 tons in 1938-39. They were 79,640 tons in 1937-38. The tonnage for other years is given. The tons reported do not include cottonseed meal sold as a feed but used as a fertilizer.

The average selling prices and composition of the different kinds of fertilizer are given.

Available phosphoric acid costs slightly less in 20 per cent superphosphate than in 18 per cent. Kainit is an expensive source of potash, muriate of potash being much cheaper.

Plant food costs less per pound in the more concentrated fertilizers than in less concentrated fertilizer, though the former costs more per ton.

The grades of fertilizer to be sold next season are given.

A table is given showing the relation of the guaranteed valuation to the valuation delivered by the various manufacturers.

Analysis of 1,208 samples collected by the inspector are given.

Suggestions are made for the use of commercial fertilizer.

Table 8. Analysis of commercial fertilizer, season 1938-39.

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	American Cyanamid Company, New York, New York				
	21% 'Aero' Cyanamid Granular Guarantee	21.00	.....	.....	$50.40
53526	Analysis	21.06	.....	.....	50.54
53669	Analysis	21.10	.....	.....	50.64
53996	Analysis	21.18	.....	.....	50.83
54020	Analysis	21.26	.....	.....	51.02
	'Ammo-Phos' 11-48-0 Guarantee	11.00	48.00	.....	88.80
53486	Analysis	11.07	**47.93**	.....	88.88
53493	Analysis	11.31	48.78	.....	90.55
	'Ammo-Phos' 16-20-0 Guarantee	16.00	20.00	.....	64.40
53485	Analysis	**15.68**	21.68	.....	65.81
53492	Analysis	**15.95**	21.25	.....	65.91
53500	Analysis	16.04	21.76	.....	66.79
	Granular 'Aero' 32% Superphosphate Guarantee	.....	32.00	.....	41.60
53529	Analysis	.....	32.85	.....	42.71
53636	Analysis	.....	**31.75**	.....	41.28
53661	Analysis	.....	**31.82**	.....	**41.37**
53667	Analysis	.....	32.02	.....	41.63
53676	Analysis	.....	32.01	.....	41.61
	Arkansas Fertilizer Company, Little Rock, Arkansas				
	White Diamond Brand Fertilizer Jack Rabbit Guarantee	4.00	8.00	6.00	27.20
53821	Analysis	4.08	8.42	6.04	27.99
54674	Analysis	4.40	8.12	**5.39**	27.59
	White Diamond Brand Fertilizer Old Reliable Guarantee	4.00	8.00	4.00	24.80
54675	Analysis	4.04	8.27	4.29	25.60
	Armour Fertilizer Works, Houston, Fort Worth, Texas, and New Orleans, La.				
	Armour's Big Crop Fertilizer 3-10-3 Guarantee	3.00	10.00	3.00	23.80
53781	Analysis	3.08	10.22	3.01	24.29
54176	Analysis	**2.96**	**9.88**	**2.91**	**23.43**
54532	Analysis	3.15	10.32	3.02	24.60
	Armour's Big Crop Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53543	Analysis	**3.85**	8.05	4.03	24.55
53715	Analysis	4.02	8.52	4.14	25.70
53730	Analysis	4.10	8.42	4.00	25.59
53778	Analysis	**3.91**	8.75	4.09	25.67
54007	Analysis	4.02	8.46	4.13	25.61
54178	Analysis	**3.89**	8.33	4.08	25.07
54188	Analysis	4.05	8.38	4.07	25.49
54294	Analysis	4.11	8.54	4.16	25.95
54446	Analysis	4.17	8.35	4.17	25.87
54486	Analysis	**3.92**	8.91	4.02	25.81
54630	Analysis	4.25	8.99	**3.95**	26.63
54679	Analysis	4.14	8.14	4.04	25.37
	Armour's Big Crop Fertilizer 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53519	Analysis	4.35	9.03	**5.54**	28.83
53523	Analysis	4.48	9.52	**5.29**	29.48
53870	Analysis	4.08	8.40	6.07	27.99
53974	Analysis	4.04	8.47	**5.83**	27.71
53999	Analysis	4.00	8.23	6.04	27.55
54009	Analysis	**3.85**	8.69	6.04	27.79
54213	Analysis	4.08	8.77	**5.57**	27.87
54232	Analysis	4.20	8.32	**5.62**	27.64
54295	Analysis	4.04	8.24	**5.87**	27.45
54447	Analysis	4.09	8.96	6.04	28.72
54687	Analysis	4.57	8.89	6.49	30.32
	Armour's Big Crop Fertilizer 4-10-0 Guarantee	4.00	10.00	.....	22.60
53525	Analysis	4.02	10.57	.....	**23.39**
53541	Analysis	**3.85**	10.39	.....	22.75

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Armour Fertilizer Works, Houston, Fort Worth, Texas, and New Orleans, La.—Continued.				
	Armour's Big Crop Fertilizer 4-10-0—Continued—				
	Guarantee	4.00	10.00	.....	22.60
53571	Analysis	**3.83**	12.01	.....	24.80
53580	Analysis	4.00	10.65	.....	23.45
53599	Analysis	**3.17**	13.63	.....	25.33
53925	Analysis	4.06	10.15	.....	22.94
54534	Analysis	4.04	10.47	.....	23.31
54554	Analysis	**3.86**	10.60	.....	23.04
	Armour's Big Crop Fertilizer 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53542	Analysis	4.32	12.22	4.03	31.10
53581	Analysis	4.21	**11.65**	4.03	30.09
53733	Analysis	4.29	12.17	4.10	31.04
53753	Analysis	4.03	**11.75**	4.02	**29.77**
53780	Analysis	4.14	**9.18**	5.46	**28.42**
54117	Analysis	4.02	12.36	4.01	30.53
54131	Analysis	4.11	12.09	4.14	30.55
54155	Analysis	4.02	12.24	4.10	30.48
54195	Analysis	**3.85**	**11.86**	**3.74**	**29.15**
54218	Analysis	4.04	**11.23**	4.04	**29.15**
54224	Analysis	4.24	12.61	4.05	31.43
54231	Analysis	4.12	**11.38**	4.13	**29.64**
54300	Analysis	4.25	12.15	4.14	30.97
54349	Analysis	4.07	12.05	4.02	30.26
54396	Analysis	4.12	**11.34**	**3.80**	**29.19**
54499	Analysis	4.04	12.01	**3.81**	**29.88**
54527	Analysis	**3.97**	**11.39**	**3.81**	**28.91**
54544	Analysis	4.00	**11.63**	**3.82**	**29.30**
54631	Analysis	**3.72**	12.95	**3.37**	**29.81**
	Armour's Big Crop Fertilizer 5-15-5 Guarantee	5.00	15.00	5.00	37.50
53532	Analysis	**4.61**	15.17	**4.86**	**36.61**
53540	Analysis	5.17	15.37	5.04	38.44
53579	Analysis	**4.68**	**14.52**	**4.92**	**36.01**
53587	Analysis	4.94	15.00	4.88	**37.22**
53594	Analysis	**4.93**	**14.20**	5.52	**36.91**
53606	Analysis	**4.85**	**14.84**	5.07	**37.01**
53619	Analysis	**4.96**	**14.87**	5.09	**37.34**
53654	Analysis	**4.90**	15.05	**4.81**	**37.10**
54528	Analysis	**4.83**	15.47	**4.86**	37.53
	Armour's Big Crop Fertilizer 6-8-4 Guarantee	6.00	8.00	4.00	29.60
53779	Analysis	6.06	9.73	4.38	32.45
54214	Analysis	**5.73**	9.79	4.02	31.30
	Armour's Big Crop Fertilizer 6-9-3 Guarantee	6.00	9.00	3.00	29.70
53913	Analysis	**5.92**	9.32	3.21	30.18
	Armour's Big Crop Fertilizer 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53578	Analysis	6.10	10.06	7.16	36.31
53586	Analysis	6.10	**9.88**	7.02	35.90
53592	Analysis	6.09	10.16	7.42	36.73
53607	Analysis	**5.86**	10.17	**6.43**	**35.00**
53655	Analysis	6.09	10.19	7.02	36.29
53681	Analysis	6.14	10.39	**6.78**	36.39
53732	Analysis	6.04	10.39	7.03	36.45
53752	Analysis	6.30	10.27	7.14	37.04
53789	Analysis	**5.87**	10.30	**6.51**	**35.29**
53914	Analysis	6.04	10.20	7.33	36.56
54022	Analysis	6.24	10.33	7.18	37.03
54529	Analysis	**5.76**	10.65	**6.62**	**35.61**
54572	Analysis	6.08	10.82	**6.64**	36.63
	Armour's Big Crop Fertilizer 6-12-6 Guarantee	6.00	12.00	6.00	37.20
53517	Analysis	**6.03**	**12.19**	6.41	38.01
53524	Analysis	6.03	12.29	6.60	38.37

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Armour Fertilizer Works, Houston, Fort Worth, Texas, and New Orleans, La.—Continued.				
	Armour's Big Crop Fertilizer 6-12-6—Continued—				
	Guarantee	6.00	12.00	6.00	37.20
53528	Analysis	6.39	12.61	6.24	39.22
53544	Analysis	5.89	12.54	6.01	37.65
53572	Analysis	6.07	12.17	5.82	37.37
53577	Analysis	6.28	11.95	6.46	38.36
53588	Analysis	6.02	12.14	5.84	37.24
53605	Analysis	6.24	12.29	6.34	38.57
53656	Analysis	5.84	12.18	6.00	37.05
53731	Analysis	6.29	12.45	5.84	38.30
54301	Analysis	6.39	12.23	6.75	39.34
54315	Analysis	5.72	12.72	6.08	37.57
54388	Analysis	5.95	12.20	5.87	37.18
54487	Analysis	6.04	12.27	5.71	37.30
54543	Analysis	6.00	12.86	6.06	38.39
54632	Analysis	5.84	12.12	6.16	37.17
	Armour's Big Crop Fertilizer 10-20-10 Guarantee	10.00	20.00	10.00	62.00
53539	Analysis	9.13	17.85	9.64	56.69
53570	Analysis	9.88	18.13	10.39	59.75
53593	Analysis	9.65	20.12	10.05	61.38
53608	Analysis	8.44	18.60	8.72	54.90
	Armour's Big Crop Fertilizer 11-48-0 Guarantee	11.00	48.00	.....	88.80
53499	Analysis	11.92	44.97	.....	87.07
	Armour's Big Crop Fertilizer 16-20-0 Guarantee	16.00	20.00	.....	64.40
53498	Analysis	15.72	21.48	.....	65.65
53527	Analysis	16.25	20.39	.....	65.51
	Armour's Big Crop Fertilizer Old Black Joe Guarantee	4.00	8.00	4.00	24.80
53576	Analysis	3.95	8.15	4.06	24.95
53609	Analysis	4.38	8.32	4.39	26.60
53869	Analysis	4.35	8.53	4.12	26.47
53973	Analysis	4.09	8.28	3.88	25.24
53981	Analysis	3.92	8.37	4.10	25.21
54147	Analysis	3.89	8.37	3.86	24.85
54167	Analysis	3.97	8.52	3.98	25.39
54196	Analysis	4.31	8.70	4.10	26.57
54246	Analysis	4.00	8.64	4.04	25.68
54268	Analysis	4.19	8.59	4.10	26.15
54312	Analysis	3.85	8.21	4.04	24.76
54340	Analysis	4.03	8.30	4.03	25.30
54387	Analysis	3.91	8.47	3.81	24.96
54480	Analysis	3.93	8.61	4.03	25.46
54488	Analysis	4.12	8.44	3.73	25.34
54505	Analysis	4.12	8.58	3.98	25.82
54526	Analysis	3.94	8.66	3.88	25.38
54553	Analysis	4.13	8.39	3.80	25.36
54579	Analysis	4.01	8.60	4.32	25.98
54629	Analysis	4.28	9.00	4.24	27.06
	Armour's Big Crop Superphosphate 18% Guarantee	.....	18.00	.....	23.40
53924	Analysis	.....	17.30	.....	22.49
54154	Analysis	.....	18.24	.....	23.71
	Armour's Big Crop Superphosphate 20% Guarantee	.....	20.00	.....	26.00
53518	Analysis	.....	20.44	.....	26.57
54496	Analysis	.....	20.35	.....	26.46
54530	Analysis	.....	20.25	.....	26.33
	Armour's Plow Brand Fertilizer Old Black Joe Guarantee	4.00	8.00	4.00	24.80
54381	Analysis	4.16	8.80	4.06	26.29
	The Barrett Company, New York, New York				
	Arcadian Nitrate of Soda Guarantee	16.00	.....	.....	38.40
53495	Analysis	16.43	.....	.....	39.43

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Bryan Cotton Oil & Fertilizer Company, Bryan, Texas				
	Star Brand Cotton and Corn Fertilizer Guarantee	3.00	10.00	3.00	23.80
53502	Analysis	3.42	10.44	4.42	27.08
53949	Analysis	4.20	10.23	4.64	28.95
54461	Analysis	**2.90**	10.68	3.64	25.21
	Star Brand Special Fertilizer Guarantee	4.00	12.00	4.00	30.00
53503	Analysis	4.43	14.63	6.34	37.26
53950	Analysis	4.87	12.08	5.78	34.33
54172	Analysis	4.83	12.66	5.01	34.06
54462	Analysis	4.65	12.30	4.71	32.80
	Star Brand 20% Superphosphate Guarantee	.....	20.00	.....	26.00
53501	Analysis	.....	20.82	.....	27.07
53947	Analysis	.....	20.90	.....	27.17
54459	Analysis	.....	20.24	.....	26.31
	Star Brand Tomato Fertilizer Guarantee	6.00	12.00	6.00	37.20
53505	Analysis	6.68	14.63	6.58	42.95
53948	Analysis	6.74	**10.60**	7.48	38.94
54460	Analysis	**5.52**	12.76	7.07	38.32
	Star Brand Truck Fertilizer Guarantee	4.00	8.00	4.00	24.80
53504	Analysis	4.66	8.33	6.12	29.35
53951	Analysis	4.56	8.19	5.72	28.45
54173	Analysis	4.09	8.99	5.08	27.61
54463	Analysis	4.41	9.97	5.22	29.80
	Campbell Fertilizer Company, Houston, Texas				
	All-Weather Organic Base Fertilizer 3-10-3 Guarantee	3.00	10.00	3.00	23.80
53510	Analysis	**2.67**	11.78	4.51	27.13
53550	Analysis	**2.57**	10.36	3.42	**23.74**
54501	Analysis	3.07	10.35	3.34	24.84
	All-Weather Organic Base Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53511	Analysis	**3.94**	8.08	5.95	27.10
53534	Analysis	**3.99**	8.73	4.72	26.59
	All-Weather Organic Base Fertilizer 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53512	Analysis	**3.44**	9.21	6.13	27.59
53548	Analysis	4.11	8.31	7.81	30.03
54504	Analysis	**3.69**	10.04	6.28	29.45
	All-Weather Organic Base Fertilizer 4-8-10 Guarantee	4.00	8.00	10.00	32.00
53547	Analysis	**3.75**	**7.95**	10.12	**31.48**
	All-Weather Organic Base Fertilizer 4-10-0 Guarantee	4.00	10.00	.....	22.60
53538	Analysis	**3.93**	12.46	.....	25.63
54520	Analysis	4.68	10.71	.....	25.15
	All-Weather Organic Base Fertilizer 4-10-7 Guarantee	4.00	10.00	7.00	31.00
53515	Analysis	**3.67**	10.21	8.56	32.35
53549	Analysis	**3.27**	**9.55**	8.01	**29.88**
54517	Analysis	4.05	11.87	8.11	34.88
	All-Weather Organic Base Fertilizer 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53536	Analysis	4.13	12.42	4.45	31.40
54146	Analysis	**3.81**	14.07	4.69	33.06
54519	Analysis	4.17	13.41	4.06	32.31
	All-Weather Organic Base Fertilizer 5-15-5 Guarantee	5.00	15.00	5.00	37.50
53533	Analysis	5.16	**14.98**	5.36	38.28
53589	Analysis	**4.35**	**14.25**	**4.89**	**34.84**
53613	Analysis	5.40	15.75	5.11	39.57
	All-Weather Organic Base Fertilizer 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53537	Analysis	6.80	**9.94**	7.42	38.14
53590	Analysis	6.33	10.45	**6.78**	36.92
53614	Analysis	6.90	10.05	7.06	38.10
	All-Weather Organic Base Fertilizer 6-12-6 Guarantee	6.00	12.00	6.00	37.20
53535	Analysis	6.44	**11.34**	6.44	37.93
53591	Analysis	6.28	**10.78**	**5.83**	**26.08**
53615	Analysis	6.14	**11.50**	6.72	37.75
	3-10-0 All Weather Rice Special Fertilizer Guarantee	3.00	10.00	.....	20.20
54518	Analysis	3.06	10.05	.....	20.41

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, Nitrogen	Potash, per cent	Valuation found, per ton
	Campbell Fertilizer Company, Houston, Texas—Continued.				
	3-10-0 All Weather Rice Special Fertilizer—				
	Continued—Guarantee	8.00	10.00	.....	20.20
54533	Analysis	**2.83**	12.03	.....	22.43
54563	Analysis	**2.63**	11.68	.....	21.49
	Chilean Nitrate Sales Corporation, 120 Broadway, New York, New York				
	Champion Brand Chilean Nitrate of Soda Guarantee	16.00	.....	.....	38.40
53639	Analysis	16.65	.....	.....	39.96
	Consolidated Chemical Industries, Inc., Houston, Texas				
	"T. C. C." Brand Raw Bone Meal Guarantee	3.70	*22.00	.....	26.48
54525	Analysis	4.80	*22.30	.....	29.36
	Crockett Fertilizer Works, Crockett, Texas				
	Crescent 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
53556	Analysis	2.78	8.39	7.03	26.02
	Crescent 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53553	Analysis	3.98	8.18	4.34	25.39
54160	Analysis	**3.59**	**7.41**	**3.75**	**22.75**
54578	Analysis	**3.73**	8.40	**3.73**	**24.35**
	Crescent 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53555	Analysis	**3.61**	**7.26**	6.28	**25.64**
54163	Analysis	**3.91**	8.05	6.13	27.21
	Crescent 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53554	Analysis	4.32	**11.30**	4.13	30.02
54161	Analysis	**3.87**	12.24	4.03	30.04
54577	Analysis	4.03	12.01	**3.72**	**29.75**
	Crescent 6-8-4 Fertilizer Guarantee	6.00	8.00	4.00	29.60
53558	Analysis	6.06	8.13	4.06	29.98
54162	Analysis	**5.59**	8.02	**3.86**	**28.48**
	Crescent 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53557	Analysis	**5.97**	**9.11**	7.05	**34.63**
54164	Analysis	6.01	10.55	**5.98**	**35.32**
	Crescent 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53559	Analysis	**5.74**	**11.12**	6.35	**35.86**
	Davison Chemical Corporation, Davison-Pick Fertilizer Division, New Orleans, La.				
	Bull Dog Special 4-8-4 Guarantee	4.00	8.00	4.00	24.80
54545	Analysis	4.02	8.18	**3.77**	24.80
	Bull Dog Special 4-12-4 Guarantee	4.00	12.00	4.00	30.00
54546	Analysis	4.09	12.14	4.03	30.44
	Dixie Chemical Company, Sulphur Springs, Texas				
	Dixie 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
54673	Analysis	4.23	8.57	4.62	26.83
	Dixie 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53995	Analysis	4.17	8.59	6.25	28.68
	East Texas Cotton Oil Company, Palestine, Texas				
	Palestine Blue Star 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53786	Analysis	4.43	**10.11**	4.29	**28.92**
53802	Analysis	4.33	**10.45**	4.18	**29.00**
54184	Analysis	4.35	**11.76**	4.17	**30.73**
54200	Analysis	4.21	12.05	4.29	30.92
54212	Analysis	4.32	12.04	4.33	31.22
54333	Analysis	4.46	**11.10**	4.12	30.07
54357	Analysis	4.10	**11.87**	4.01	30.08
54584	Analysis	4.57	12.07	4.29	31.81

*Total phosphoric acid

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	East Texas Cotton Oil Company, Palestine, Texas —Continued.				
	Palestine Blue Star 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53805	Analysis	6.31	9.83	6.24	35.41
54335	Analysis	6.66	9.71	6.21	36.05
54358	Analysis	6.36	10.05	6.29	35.88
54583	Analysis	6.40	10.04	6.07	35.69
	Palestine Blue Star 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
54220	Analysis	6.35	12.17	6.15	38.44
54331	Analysis	6.53	11.72	6.03	38.15
	Palestine Cotton Producer Guarantee	3.00	10.00	3.00	23.80
53799	Analysis	3.26	9.27	3.24	23.76
54198	Analysis	3.01	10.01	3.54	24.48
	Palestine Perfection Guarantee	6.00	9.00	3.00	29.70
54585	Analysis	8.04	8.64	2.39	33.40
	Palestine Tomato Special Guarantee	4.00	8.00	6.00	27.20
53800	Analysis	4.32	7.48	6.06	27.36
53804	Analysis	4.41	7.06	5.05	25.82
54223	Analysis	4.09	8.21	5.65	27.27
54339	Analysis	4.30	7.58	5.27	26.49
	Palestine Twenty Per Cent Superphosphate Guarantee	.....	20.00	.....	26.00
54182	Analysis	.....	19.31	.....	25.10
	Palestine Upland Cotton Guarantee	4.00	8.00	4.00	24.80
53777	Analysis	4.14	7.90	4.19	25.24
53787	Analysis	4.12	7.70	4.73	25.58
53801	Analysis	4.35	7.62	4.68	25.97
54174	Analysis	4.32	8.32	4.56	26.66
54206	Analysis	4.14	7.01	4.46	24.40
54219	Analysis	4.11	8.07	4.29	25.50
54326	Analysis	4.28	8.01	4.41	25.97
54332	Analysis	4.26	8.10	4.51	26.16
54582	Analysis	3.79	7.97	4.23	24.54
	East Texas Cotton Oil Company, Tyler, Texas				
	Etco 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53828	Analysis	3.81	8.04	6.15	26.97
53874	Analysis	4.06	7.67	5.73	26.59
54282	Analysis	4.17	8.21	7.11	29.21
54614	Analysis	4.24	7.90	5.26	26.76
	Etco 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53875	Analysis	4.24	11.61	4.17	30.27
54263	Analysis	4.28	12.06	3.81	30.52
	Etco 6-9-3 Fertilizer Guarantee	6.00	9.00	3.00	29.70
53878	Analysis	6.05	9.47	3.36	30.86
	Etco 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53881	Analysis	6.20	9.26	6.93	35.24
53896	Analysis	5.80	10.31	6.84	35.53
54285	Analysis	6.02	9.86	6.69	35.30
	Etco 18 Per Cent Superphosphate Guarantee	.....	18.00	.....	23.40
53884	Analysis	.....	18.00	.....	23.40
	Etco 20 Per Cent Superphosphate Guarantee	.....	20.00	.....	26.00
53883	Analysis	.....	19.38	.....	25.19
54286	Analysis	.....	20.35	.....	26.46
54618	Analysis	.....	20.81	.....	27.05
	Etco Potato Producer Guarantee	4.00	8.00	4.00	24.80
53827	Analysis	3.77	8.24	3.90	24.44
54238	Analysis	5.24	7.55	4.04	27.25
54281	Analysis	3.93	9.55	4.50	27.25
	Etco Sulphate of Ammonia Guarantee	20.00	.....	.....	48.00
53882	Analysis	20.80	.....	.....	49.92

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	East Texas Cotton Oil Company, Tyler, Texas—Continued.				
	Goldenrod 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
54264	Analysis	4.07	**7.79**	5.84	**26.91**
54284	Analysis	4.02	**7.90**	7.37	28.76
	Goldenrod 4-8-10 Fertilizer Guarantee	4.00	8.00	10.00	32.00
53880	Analysis	4.18	8.01	10.07	32.52
	Goldenrod 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53877	Analysis	4.37	**10.97**	4.18	**29.77**
54207	Analysis	4.18	12.06	**3.95**	30.45
54222	Analysis	4.02	12.22	4.06	30.41
54261	Analysis	4.31	**11.38**	4.12	30.07
54267	Analysis	4.36	12.29	4.01	31.25
54279	Analysis	5.32	**8.45**	6.04	31.01
54616	Analysis	4.38	**11.63**	4.58	31.13
	Goldenrod 6-8-4 Fertilizer Guarantee	6.00	8.00	4.00	29.60
54280	Analysis	**4.29**	12.17	5.06	32.19
	Goldenrod 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
54266	Analysis	**5.73**	10.12	7.11	**35.44**
54615	Analysis	6.21	**9.86**	7.32	36.50
	Goldenrod Meal Formula Guarantee	3.00	10.00	3.00	23.80
53879	Analysis	3.02	**8.66**	3.23	**22.39**
54239	Analysis	3.04	**9.59**	3.05	**23.43**
	Goldenrod Potato Producer Guarantee	4.00	8.00	4.00	24.80
53876	Analysis	4.05	**7.27**	4.02	**23.99**
54171	Analysis	4.39	9.06	4.10	27.24
54283	Analysis	4.03	**7.83**	4.22	24.91
54617	Analysis	**3.94**	**7.30**	4.06	**23.82**
	Farmers Cotton Oil Company, Winnsboro, Texas				
	Farmers Fertilizer No. 484 Guarantee	4.00	8.00	4.00	24.80
53986	Analysis	4.37	8.32	4.52	26.73
54455	Analysis	4.33	8.36	4.30	26.42
54683	Analysis	4.02	8.77	4.19	26.08
	Farmers Fertilizer No. 486 Guarantee	4.00	8.00	6.00	27.20
54031	Analysis	4.17	8.42	**5.89**	28.03
54454	Analysis	4.35	8.39	**5.77**	28.27
54684	Analysis	4.08	9.31	6.09	29.20
	Farmers Fertilizer No. 4124 Guarantee	4.00	12.00	4.00	30.00
53987	Analysis	4.44	**11.60**	4.27	30.86
54457	Analysis	4.41	**11.81**	4.31	31.10
	Farmers Fertilizer No. 684 Guarantee	6.00	8.00	4.00	29.60
54456	Analysis	6.26	8.04	**3.85**	30.09
	Farmers Fertilizer No. 6107 Guarantee	6.00	10.00	7.00	35.80
54030	Analysis	6.51	10.60	7.84	38.81
	Federal Chemical Company, Inc., Shreveport, La.				
	Daybreak Dixie Special Guarantee	4.00	8.00	4.00	24.80
54415	Analysis	4.23	8.02	4.01	25.39
54440	Analysis	**3.83**	8.10	4.12	**24.66**
54444	Analysis	4.13	8.20	4.30	25.73
54469	Analysis	4.14	9.35	4.01	26.91
	Daybreak Double Duty Guarantee	4.00	12.00	4.00	30.00
54151	Analysis	4.14	**11.00**	4.08	**29.14**
	Daybreak Truckers Special Guarantee	4.00	8.00	6.00	27.20
53891	Analysis	4.15	**7.75**	6.04	27.29
53955	Analysis	4.26	8.22	**5.69**	27.74
54021	Analysis	4.47	8.58	6.04	29.13
54027	Analysis	4.24	8.35	**5.75**	27.94
54042	Analysis	4.06	8.50	6.08	28.06
54225	Analysis	4.01	8.72	**4.77**	**26.68**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Federal Chemical Company, Inc., Shreveport, La. —Continued.				
	Meridian 6-8-4 Fertilizer Guarantee	6.00	8.00	4.00	29.60
54485	Analysis	6.05	8.92	4.05	30.98
	Meridian 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
54575	Analysis	6.10	12.77	6.21	38.69
	Meridian Dixie Special Guarantee	4.00	8.00	4.00	24.80
53746	Analysis	4.20	8.52	4.04	26.01
53769	Analysis	4.09	8.26	4.47	25.92
53921	Analysis	4.05	**7.85**	4.20	24.97
53936	Analysis	4.01	8.24	4.12	25.27
53944	Analysis	4.00	9.80	**3.80**	26.90
54013	Analysis	4.02	8.30	**3.84**	25.05
54040	Analysis	4.06	8.84	4.14	26.20
54071	Analysis	4.04	8.72	4.09	25.95
54274	Analysis	**3.94**	8.94	**3.87**	25.72
54475	Analysis	**3.90**	9.20	4.04	26.17
54484	Analysis	4.07	9.67	4.02	27.16
54624	Analysis	4.01	**7.99**	4.24	25.10
	Meridian Double Duty Guarantee	4.00	12.00	4.00	30.00
53723	Analysis	4.12	**11.19**	4.25	**29.54**
53923	Analysis	4.12	**11.21**	4.30	**29.62**
53937	Analysis	4.05	**11.49**	4.19	**29.69**
54070	Analysis	4.08	13.46	**3.85**	31.91
54111	Analysis	4.06	12.38	4.06	30.70
54114	Analysis	4.07	**11.41**	4.16	**29.59**
54168	Analysis	4.18	12.93	4.25	31.94
54194	Analysis	4.34	13.32	4.02	32.56
54229	Analysis	4.06	12.68	4.05	31.08
54351	Analysis	4.38	12.61	4.16	31.89
	Meridian Favorite Fertilizer Guarantee	3.00	10.00	3.00	23.80
54112	Analysis	3.01	10.36	3.09	24.40
54135	Analysis	**2.90**	10.49	3.38	24.66
54169	Analysis	**2.91**	**9.89**	3.18	**23.66**
	Meridian Perfection Formula Guarantee	6.00	9.00	3.00	29.70
54093	Analysis	6.32	9.15	3.02	30.69
	Meridian Southern Mixture Guarantee	4.00	10.00	.....	22.60
53745	Analysis	4.18	10.24	.....	23.34
	Meridian Special Mixture Guarantee	6.00	10.00	7.00	35.80
53747	Analysis	**5.97**	10.28	**6.84**	35.90
53770	Analysis	6.03	10.27	**6.39**	**35.49**
54012	Analysis	6.06	10.34	7.24	36.67
	Meridian Truckers Special Guarantee	4.00	8.00	6.00	27.20
53873	Analysis	4.20	8.38	6.10	28.29
53922	Analysis	4.39	**7.61**	6.08	27.73
53943	Analysis	4.11	8.86	6.05	28.64
54000	Analysis	4.13	8.16	**5.91**	27.61
54019	Analysis	4.19	8.33	6.04	28.14
54033	Analysis	4.22	8.13	6.17	28.10
54099	Analysis	4.02	8.65	**5.74**	27.79
54428	Analysis	4.02	8.77	6.67	29.05
54685	Analysis	4.32	8.29	6.16	28.54
	Fidelity Chemical Corporation, Houston, Texas				
	Fidelity 0-12-4 Fertilizer Guarantee	.....	12.00	4.00	29.40
53686	Analysis	.....	**11.55**	4.54	20.47
	Fidelity 3-10-0 Fertilizer Guarantee	3.00	10.00	.....	20.20
54516	Analysis	**2.93**	10.01	.....	**20.04**
54561	Analysis	3.50	**8.69**	.....	**19.70**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Fidelity Chemical Corporation, Houston, Texas—Continued.				
	Fidelity 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
53600	Analysis	4.77	10.16	3.80	29.22
53691	Analysis	3.67	9.85	3.16	25.41
53738	Analysis	3.65	10.17	3.10	25.70
53759	Analysis	3.65	9.12	3.23	24.50
54077	Analysis	3.27	10.08	2.49	23.94
54208	Analysis	3.67	9.88	3.24	25.54
54509	Analysis	3.06	10.00	3.20	24.18
	Fidelity 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53617	Analysis	4.22	8.99	4.03	26.66
53629	Analysis	4.14	8.15	4.10	25.46
53688	Analysis	3.89	9.24	3.40	25.43
53737	Analysis	4.28	8.22	4.08	25.86
53761	Analysis	4.21	8.30	4.04	25.74
54076	Analysis	4.23	7.96	3.74	24.99
54313	Analysis	4.53	8.39	4.10	26.70
54512	Analysis	4.34	7.73	4.04	25.32
54548	Analysis	3.69	7.39	3.81	23.04
54558	Analysis	4.11	8.09	3.86	25.01
	Fidelity 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53516	Analysis	4.13	8.15	5.23	26.79
53678	Analysis	3.97	8.09	5.46	26.60
53685	Analysis	4.01	8.80	6.61	28.99
53739	Analysis	4.09	8.42	5.44	27.30
54508	Analysis	4.16	8.00	5.94	27.51
54510	Analysis	4.06	7.69	6.07	27.02
	Fidelity 4-10-0 Fertilizer Guarantee	4.00	10.00	.....	22.60
53569	Analysis	4.87	11.20	.....	26.25
54514	Analysis	4.60	9.11	.....	22.88
54571	Analysis	4.50	10.28	.....	24.16
	Fidelity 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53509	Analysis	4.08	11.25	4.07	29.30
53598	Analysis	4.22	11.45	4.03	29.86
53616	Analysis	4.10	11.93	4.38	30.61
53620	Analysis	4.11	11.52	3.70	29.28
53693	Analysis	4.39	11.67	3.78	30.25
53694	Analysis	4.14	11.27	4.08	29.49
53760	Analysis	4.23	11.90	3.77	30.14
54078	Analysis	4.63	11.27	3.94	30.49
54139	Analysis	4.22	11.65	4.32	30.46
54152	Analysis	4.27	12.10	4.26	31.09
54183	Analysis	4.21	12.07	4.03	30.63
54187	Analysis	4.00	12.54	3.50	30.10
54209	Analysis	4.04	11.53	4.56	30.16
54211	Analysis	4.15	12.02	4.10	30.51
54303	Analysis	3.64	12.69	3.24	29.13
54511	Analysis	4.38	11.67	4.06	30.55
	Fidelity 5-15-5 Fertilizer Guarantee	5.00	15.00	5.00	37.50
53603	Analysis	5.14	14.23	4.35	36.06
53648	Analysis	5.27	13.86	5.00	36.67
53660	Analysis	5.39	14.48	4.58	37.26
53673	Analysis	5.40	15.12	4.29	37.77
53692	Analysis	5.18	14.34	5.40	37.55
	Fidelity 6-9-3 Fertilizer Guarantee	6.00	9.00	3.00	29.70
53683	Analysis	5.89	8.81	3.42	29.69
	Fidelity 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53574	Analysis	6.05	9.92	7.12	35.96
53604	Analysis	6.29	9.86	6.80	36.08
53628	Analysis	5.90	10.36	6.39	35.30

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Fidelity Chemical Corporation, Houston, Texas—Continued.				
	Fidelity 6-10-7 Fertilizer—Continued—Guarantee	6.00	10.00	7.00	35.80
53649	Analysis	6.18	**9.89**	7.09	36.20
53679	Analysis	6.00	**9.47**	**6.64**	**34.68**
53689	Analysis	6.32	**9.69**	7.08	36.27
54028	Analysis	6.12	10.09	**6.90**	36.09
54106	Analysis	6.27	**9.82**	**6.79**	35.97
54458	Analysis	6.01	**9.79**	7.37	35.99
54489	Analysis	6.08	10.06	**6.93**	35.99
54513	Analysis	6.15	**9.36**	7.24	**35.62**
	Fidelity 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53496	Analysis	**5.83**	13.88	**5.93**	39.15
53508	Analysis	6.14	12.18	6.29	38.12
53514	Analysis	6.18	12.09	6.52	38.37
53573	Analysis	6.04	**11.45**	6.35	**37.01**
53575	Analysis	6.23	**11.47**	6.34	37.47
53601	Analysis	6.25	**11.84**	6.27	37.91
53621	Analysis	6.24	**11.77**	6.29	37.83
53630	Analysis	6.35	**11.80**	6.30	38.14
53647	Analysis	6.35	**11.99**	6.27	38.35
53690	Analysis	6.25	**11.24**	6.14	**36.98**
53736	Analysis	6.24	**11.75**	6.16	37.65
54158	Analysis	6.26	12.44	6.20	38.63
	Fidelity 10-20-10 Fertilizer Guarantee	10.00	20.00	10.00	62.00
53568	Analysis	**9.26**	**16.97**	**9.30**	**55.44**
53602	Analysis	10.36	**18.77**	**9.32**	**60.44**
53642	Analysis	**9.47**	**17.98**	**8.99**	**56.89**
	Fidelity 16-20-0 Fertilizer Guarantee	16.00	20.00	.....	64.40
53646	Analysis	**13.79**	20.63	.....	**59.92**
53659	Analysis	**15.39**	**17.95**	.....	**60.28**
53687	Analysis	16.66	**19.08**	.....	64.78
	Fidelity Sulphate of Ammonia Guarantee	20.00	.....	.....	48.00
53635	Analysis	20.56	.....	.....	49.34
53643	Analysis	20.88	.....	.....	50.11
	Fidelity 18% Superphosphate Guarantee	.....	18.00	.....	23.40
53513	Analysis	.....	18.19	.....	23.65
53597	Analysis	.....	**17.73**	.....	**23.05**
54515	Analysis	.....	**17.65**	.....	**22.95**
54547	Analysis	.....	18.27	.....	23.75
	Fidelity 20% Superphosphate Guarantee	.....	20.00	.....	26.00
53641	Analysis	.....	20.55	.....	26.72
53684	Analysis	.....	20.57	.....	26.74
	Ferti-Lome, Specially prepared for San Augustine & Bermuda Lawns Guarantee	6.00	8.00	4.00	29.60
53622	Analysis	6.37	8.81	4.04	31.59
	Ford Motor Company, Dearborn, Michigan				
	Ford Ammonium Sulphate Guarantee	20.80	.....	.....	49.92
53682	Analysis	20.86	.....	.....	50.06
54259	Analysis	20.80	.....	.....	49.92
54531	Analysis	21.00	.....	.....	50.40
	Gate City Fertilizer Company, Little Rock, Arkansas				
	Red Ball Fertilizer Red Ball 4-8-4 Guarantee	4.00	8.00	4.00	24.80
54467	Analysis	4.04	**7.93**	**3.42**	**24.11**
	Gilmer Cotton Oil & Fertilizer Company, Gilmer, Texas				
	G. C. O. & F. Co.'s 4-8-4 Cotton Grower Guarantee	4.00	8.00	4.00	24.80
53964	Analysis	4.09	8.36	**3.50**	24.89
54410	Analysis	4.25	8.43	**3.78**	25.70
54647	Analysis	**3.91**	8.21	4.65	25.63

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Gilmer Cotton Oil & Fertilizer Company, Gilmer, Texas —Continued.				
	G. C. O. & F. Co.'s 4-8-10 Guarantee	4.00	8.00	10.00	32.00
54648	Analysis	4.09	8.17	**9.29**	**31.59**
	G. C. O. & F. Co.'s 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53962	Analysis	4.03	**11.76**	4.41	30.25
54406	Analysis	4.44	**11.51**	4.48	31.00
	G. C. O. & F. Co.'s 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53960	Analysis	6.05	10.27	7.14	**36.44**
54407	Analysis	6.08	11.44	**6.72**	37.52
54644	Analysis	6.78	10.09	**3.96**	**34.14**
	G. C. O. & F. Co.'s Special Cotton Grower Guarantee	6.00	12.00	6.00	37.20
53961	Analysis	6.01	12.07	**5.62**	**36.85**
54409	Analysis	6.65	12.01	**5.26**	37.88
54646	Analysis	6.06	12.01	6.14	37.52
	G. C. O. & F. Co.'s Superior Meal Compound Guarantee	3.00	10.00	3.00	23.80
53963	Analysis	3.08	**9.68**	3.04	**23.62**
54408	Analysis	3.16	10.19	3.15	24.61
54649	Analysis	3.46	10.74	3.12	26.00
	G. C. O. & F. Co.'s 4-8-6 Tomato Grower Guarantee	4.00	8.00	6.00	27.20
53959	Analysis	4.00	**7.24**	6.57	**26.89**
54405	Analysis	4.65	8.38	6.08	29.35
54645	Analysis	4.17	8.17	**5.46**	**27.18**
	Houston Packing Company, Houston, Texas				
	Houston's High Grade 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
53522	Analysis	4.09	11.58	**2.69**	28.10
	Houston's High Grade 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53521	Analysis	5.06	10.60	**4.89**	31.79
	Houston's B. & B. Fertilizer Guarantee	4.70	*15.50	.....	23.68
53520	Analysis	6.11	*17.01	.....	28.27
54524	Analysis	4.78	*18.33	.....	26.13
	International Agricultural Corporation, Texarkana, Arkansas-Texas				
	International 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53775	Analysis	4.11	8.40	4.07	25.66
53812	Analysis	4.02	**7.07**	4.04	**23.69**
53854	Analysis	4.06	**7.35**	4.06	**24.17**
53906	Analysis	**3.94**	**7.46**	4.12	**24.16**
53965	Analysis	4.02	8.32	**3.79**	25.02
53992	Analysis	4.09	**7.05**	4.14	**23.96**
54278	Analysis	4.06	7.78	3.88	**24.51**
54338	Analysis	4.07	8.08	4.07	25.15
54375	Analysis	4.04	7.89	**3.85**	**24.46**
54399	Analysis	4.17	8.19	3.85	25.28
54665	Analysis	**3.83**	8.05	**3.91**	**24.35**
54671	Analysis	4.06	8.27	**3.93**	25.21
54676	Analysis	4.01	8.03	4.03	24.90
	International 4-8-4 Olde Tyme Fertilizer Guarantee	4.00	8.00	4.00	24.80
53912	Analysis	4.06	8.10	4.24	25.36
	International 4-8-6 Truck Fertilizer Guarantee	4.00	8.00	6.00	27.20
53853	Analysis	4.12	8.05	6.08	27.66
53868	Analysis	4.06	**6.89**	6.04	**25.95**
53983	Analysis	4.13	**7.08**	5.86	**26.14**
53991	Analysis	**3.74**	**7.22**	5.81	**25.34**
53994	Analysis	**3.96**	8.15	6.09	27.41
53997	Analysis	**3.82**	**7.33**	6.21	**26.15**
54026	Analysis	4.01	8.01	**5.39**	**26.56**
54048	Analysis	4.04	**7.74**	6.07	**27.84**

*Total phosphoric acid

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	International Agricultural Corporation, Texarkana, Arkansas-Texas—Continued.				
	International 4-8-6 Truck Fertilizer—Continued—				
	Guarantee	4.00	8.00	6.00	27.20
54053	Analysis	4.00	**7.91**	**5.58**	**26.58**
54054	Analysis	**3.99**	**7.95**	6.05	**27.18**
54426	Analysis	**3.88**	**7.53**	**5.87**	**26.14**
54441	Analysis	4.01	8.28	6.15	27.76
	International 4-8-10 Fertilizer Guarantee	4.00	8.00	10.00	32.00
54001	Analysis	4.15	8.08	10.09	32.57
54425	Analysis	4.08	**7.26**	10.17	**31.43**
54657	Analysis	4.03	8.47	10.09	32.79
	International 4-10-7 Fertilizer Guarantee	4.00	10.00	7.00	31.00
53774	Analysis	4.20	10.07	7.11	31.70
	International 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53851	Analysis	**3.92**	**11.23**	4.14	**28.98**
54442	Analysis	4.08	12.01	4.15	30.38
	International 4-12-4 Rainbow Cotton Fertilizer Guarantee	4.00	12.00	4.00	30.00
54400	Analysis	4.03	**11.46**	**3.81**	**29.14**
54423	Analysis	4.05	12.12	**3.95**	30.22
54464	Analysis	4.06	12.30	4.09	30.64
	International 6-8-8 Fertilizer Guarantee	6.00	8.00	8.00	34.40
54424	Analysis	**5.93**	**7.65**	8.12	**33.92**
54656	Analysis	6.06	8.09	8.12	34.80
	International 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53813	Analysis	**5.90**	**9.29**	**6.84**	**34.45**
53855	Analysis	**5.94**	**9.50**	7.06	**35.08**
53871	Analysis	6.02	**9.44**	**6.62**	**34.66**
54002	Analysis	**5.76**	10.12	**6.94**	**35.31**
54377	Analysis	**5.89**	10.39	**6.46**	**35.40**
	International 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53811	Analysis	**5.94**	**11.45**	6.35	**36.77**
53852	Analysis	**5.84**	12.03	6.29	37.21
54587	Analysis	6.08	**11.48**	6.25	**37.01**
	International 18% Superphosphate Guarantee	.....	18.00	.....	23.40
53993	Analysis	.....	18.84	.....	24.49
54437	Analysis	.....	18.22	.....	23.69
	International 20% Superphosphate Guarantee	.....	20.00	.....	26.00
53776	Analysis	.....	20.22	.....	26.29
	Jacksonville Fertilizer Company, Jacksonville, Texas				
	Red Tomato 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
54308	Analysis	3.94	10.30	4.14	27.82
	Red Tomato 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53862	Analysis	4.26	8.11	4.55	26.22
54309	Analysis	4.20	8.79	4.76	27.22
54600	Analysis	4.72	**7.77**	4.33	26.63
	Red Tomato 4-8-10 Fertilizer Guarantee	4.00	8.00	10.00	32.00
53863	Analysis	4.22	9.04	**9.59**	33.39
	Red Tomato 4-10-0 Fertilizer Guarantee	4.00	10.00	.....	22.60
53865	Analysis	4.58	11.12	.....	25.45
	Red Tomato 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53864	Analysis	4.60	13.46	4.06	33.41
	Red Tomato 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53861	Analysis	**5.80**	10.05	**6.29**	**34.54**
54310	Analysis	6.29	10.94	7.39	38.19
54602	Analysis	6.39	10.31	**6.27**	36.26
	Red Tomato 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
54307	Analysis	**5.64**	13.41	6.77	39.09
54591	Analysis	6.30	**11.00**	6.36	**37.05**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Jacksonville Fertilizer Company, Jacksonville, Texas —Continued.				
	Red Tomato 10-0-10 Fertilizer Guarantee	10.00	.....	10.00	36.00
54601	Analysis	10.28	.....	8.66	35.06
	Kelly-Weber & Company, Inc., Lake Charles, La.				
	Weber-King Brand Fertilizer Special No. 3100 Guarantee	3.00	10.00	.....	20.20
54564	Analysis	3.58	10.10	.....	21.72
	Weber-King Brand Fertilizer Special No. 484 Guarantee	4.00	8.00	4.00	24.80
53697	Analysis	3.90	7.52	4.02	23.96
54115	Analysis	3.84	8.15	4.08	24.72
54142	Analysis	3.89	8.22	4.03	24.87
	Weber-King Brand Fertilizer Special No. 4100 Guarantee	4.00	10.00	.....	22.60
54550	Analysis	4.02	8.74	.....	21.01
54560	Analysis	4.15	9.30	.....	22.05
	Weber-King Brand Fertilizer Special No. 4124 Guarantee	4.00	12.00	4.00	30.00
54116	Analysis	4.15	11.84	4.15	30.33
54551	Analysis	4.02	11.03	4.40	29.27
54557	Analysis	4.09	10.70	4.02	28.55
	Weber-King Brand Fertilizer Special No. 6126 Guarantee	6.00	12.00	6.00	37.20
53696	Analysis	5.94	11.13	6.64	36.70
54556	Analysis	5.95	11.85	6.37	37.33
	Weber-King Brand 18% Superphosphate Guarantee	.....	18.00	.....	23.40
54549	Analysis	.....	17.52	.....	22.78
	Longview Cotton Oil Company, Longview, Texas				
	Longview Corn and Cotton Special Fertilizer Guarantee	4.00	12.00	4.00	30.00
53978	Analysis	4.08	12.01	4.03	30.24
54384	Analysis	4.28	11.13	4.57	30.22
	Longview Cotton Special Fertilizer Guarantee	3.00	10.00	3.00	23.80
54626	Analysis	3.98	8.48	4.10	25.49
	Longview Crop Special Fertilizer Guarantee	6.00	9.00	3.00	29.70
54386	Analysis	6.80	8.90	3.32	31.87
	Longview Gregg County Special Fertilizer Guarantee	4.00	8.00	4.00	24.80
53942	Analysis	3.81	7.82	4.23	24.39
54382	Analysis	4.15	8.15	4.37	25.80
54628	Analysis	4.00	8.24	4.46	25.66
	Longview Prize Fertilizer Guarantee	6.00	12.00	6.00	37.20
53979	Analysis	6.04	7.63	7.72	33.68
54385	Analysis	6.06	12.63	6.73	39.04
	Longview Truck Special Fertilizer Guarantee	4.00	8.00	6.00	27.20
53941	Analysis	3.84	7.70	6.14	26.60
54383	Analysis	4.01	8.58	6.44	28.50
	Longview Vegetable Fertilizer Guarantee	6.00	10.00	7.00	35.80
54627	Analysis	5.87	8.85	7.44	34.53
	Longview 20% Superphosphate Guarantee	.....	20.00	.....	26.00
54625	Analysis	.....	20.04	.....	26.05
	Marshall Cotton Oil Company, Marshall, Texas				
	Marshall 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
54094	Analysis	3.33	10.47	3.45	25.74
	Marshall 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53930	Analysis	4.06	7.37	4.05	24.18
54105	Analysis	3.88	8.31	4.10	25.03
54397	Analysis	3.82	8.10	4.02	24.52
54493	Analysis	3.52	8.19	4.21	24.15
54636	Analysis	3.67	7.57	4.08	23.55
	Marshall 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53934	Analysis	4.06	8.07	5.74	27.12

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Marshall Cotton Oil Company, Marshall, Texas—Continued.				
	Marshall 4-8-6 Fertilizer—Continued—Guarantee	4.00	8.00	6.00	27.20
54095	Analysis	**3.78**	**7.66**	**5.94**	**26.16**
54391	Analysis	**3.93**	8.15	6.11	27.36
54638	Analysis	**3.91**	9.32	**5.69**	28.33
	Marshall 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53932	Analysis	4.24	**11.79**	4.35	30.73
54096	Analysis	4.18	**11.85**	4.38	30.70
54393	Analysis	4.00	12.28	4.04	30.41
54637	Analysis	4.08	**11.60**	4.29	30.02
	Marshall 6-8-4 Fertilizer Guarantee	6.00	8.00	4.00	29.60
53931	Analysis	**5.51**	**7.84**	4.26	**28.52**
54104	Analysis	**5.99**	**7.59**	4.00	**29.05**
54394	Analysis	**5.60**	**7.73**	4.22	**28.55**
54639	Analysis	**5.38**	8.03	4.24	**28.44**
	Marshall 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53935	Analysis	**5.79**	10.09	**6.82**	**35.20**
54392	Analysis	**5.81**	**9.61**	7.27	**35.15**
	Marshall 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53933	Analysis	6.25	**11.24**	5.79	**36.56**
54103	Analysis	6.19	12.08	**5.79**	37.51
	Mixson Brothers, Kirbyville, Texas				
	Jasco Brand Special No. 3-10-3 Guarantee	3.00	10.00	3.00	23.80
53713	Analysis	3.40	**9.17**	3.55	24.34
	Jasco Brand Special No. 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53711	Analysis	**3.84**	8.77	4.15	25.60
54119	Analysis	**3.87**	8.63	**3.73**	24.99
54297	Analysis	4.04	8.68	4.47	26.34
	Jasco Brand Special No. 4-8-10 Guarantee	4.00	8.00	10.00	32.00
53714	Analysis	4.35	**7.37**	11.36	33.65
	Jasco Brand Special No. 4-10-7 Guarantee	4.00	10.00	7.00	31.00
53710	Analysis	4.34	**9.60**	7.52	31.92
	Jasco Brand Special No. 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53712	Analysis	4.20	**11.32**	**3.89**	**29.47**
54191	Analysis	4.36	12.38	4.76	32.26
	Jasco Brand Special No. 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53744	Analysis	6.28	**9.82**	7.05	**36.30**
	Jasco Brand Special No. 6-12-6 Guarantee	6.00	12.00	6.00	37.20
53743	Analysis	6.06	12.13	**5.71**	**37.16**
	Muriate of Potash Guarantee	.....	.....	50.00	60.00
54566	Analysis	.....	.....	50.58	60.70
	20 Percent Kainit Guarantee	.....	.....	20.00	24.00
54567	Analysis	.....	.....	21.69	26.03
	Nicholson's Seed Store, Dallas, Texas				
	Nicholson's All-Round Fertilizer Guarantee	4.00	12.00	4.00	30.00
54256	Analysis	4.44	12.03	4.06	31.17
	Nicholson's Evergreen Lawn Dressing Guarantee	10.00	6.00	4.00	36.60
54257	Analysis	**9.36**	7.35	4.53	37.46
	Oil Mill & Fertilizer Works, Henderson, Texas				
	Wolf Brand Fertilizer 3-10-3 Guarantee	3.00	10.00	3.00	23.80
53900	Analysis	3.40	10.39	3.31	25.64
	Wolf Brand Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53902	Analysis	4.26	**7.59**	4.27	25.21
54378	Analysis	**3.57**	8.59	**3.79**	**24.29**
54610	Analysis	4.02	8.87	4.16	26.17

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Oil Mill & Fertilizer Works, Henderson, Texas—Continued.				
	Wolf Brand Fertilizer 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53899	Analysis	4.15	**7.86**	6.07	27.46
	Wolf Brand Fertilizer 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53898	Analysis	**5.81**	10.01	**6.88**	**35.21**
	Wolf Brand Fertilizer 6-12-6 Guarantee	6.00	12.00	6.00	37.20
53901	Analysis	**5.41**	**11.18**	**5.41**	**34.00**
	Wolf Brand Superphosphate 18 Per Cent Guarantee	.....	18.00	.....	23.40
54379	Analysis	.....	18.63	.....	24.22
	Wolf Brand Superphosphate 20 Per Cent Guarantee	.....	20.00	.....	26.00
54380	Analysis	.....	20.37	.....	26.48
	Pate Bros. Fertilizer Works, Sulphur Springs, Texas				
	Pate's Red Star Brand 3-10-3 Fertilizers Guarantee	3.00	10.00	3.00	23.80
53989	Analysis	3.86	10.44	3.61	27.16
54411	Analysis	3.08	10.78	3.20	25.24
54449	Analysis	3.07	10.42	3.16	24.71
54689	Analysis	3.15	10.89	3.27	25.64
	Pate's Red Star Brand 4-8-4 Fertilizers Guarantee	4.00	8.00	4.00	24.80
53976	Analysis	4.16	8.59	4.26	26.26
54451	Analysis	4.06	8.74	4.39	26.37
54471	Analysis	4.01	8.70	4.33	26.13
54642	Analysis	4.44	8.42	**3.69**	26.04
54690	Analysis	4.23	8.25	**3.80**	25.44
	Pate's Red Star Brand 4-8-6 Fertilizers Guarantee	4.00	8.00	6.00	27.20
53975	Analysis	4.22	**7.61**	6.55	27.88
54448	Analysis	4.52	**7.60**	6.03	27.97
54472	Analysis	4.26	8.28	6.26	28.49
54643	Analysis	4.45	8.11	5.79	28.17
54688	Analysis	4.08	8.40	**5.53**	27.35
	Pate's Red Star Brand 4-8-10 Fertilizers Guarantee	4.00	8.00	10.00	32.00
54032	Analysis	4.48	8.07	**9.79**	32.99
	Pate's Red Star Brand 4-12-4 Fertilizers Guarantee	4.00	12.00	4.00	30.00
53990	Analysis	4.48	12.01	4.62	31.90
54691	Analysis	4.38	12.23	4.82	32.19
	Pate's Red Star Brand 6-12-6 Fertilizers Guarantee	6.00	12.00	6.00	37.20
54450	Analysis	6.50	12.09	**5.83**	38.32
	Pittsburg Cotton Oil Company, Pittsburg, Texas				
	Double Circle Fertilizer 3-10-3 Guarantee	3.00	10.00	3.00	23.80
54416	Analysis	3.46	**9.65**	3.00	24.45
	Double Circle Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53969	Analysis	4.19	9.52	4.36	27.67
54017	Analysis	4.34	**7.36**	4.23	25.07
54417	Analysis	4.09	8.38	**3.43**	24.83
54662	Analysis	**3.82**	**7.90**	**3.67**	**23.84**
	Double Circle Fertilizer 4-8-6 Guarantee	4.00	8.00	6.00	27.20
54016	Analysis	**3.82**	**6.91**	**5.51**	**24.76**
54100	Analysis	**3.67**	7.85	6.47	**26.78**
54418	Analysis	**3.86**	8.03	**5.58**	**26.40**
	Double Circle Fertilizer 4-8-10 Guarantee	4.00	8.00	10.00	32.00
53985	Analysis	**3.86**	8.24	**8.60**	**30.29**
	Double Circle Fertilizer 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53970	Analysis	4.30	**11.72**	4.04	30.41
54419	Analysis	4.14	12.40	**3.32**	30.04
54663	Analysis	4.19	**11.17**	**3.55**	**28.84**
	Double Circle Fertilizer 6-8-4 Guarantee	6.00	8.00	4.00	29.60
53971	Analysis	6.00	**7.65**	4.02	**29.17**
54660	Analysis	6.00	**7.25**	4.11	**28.76**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Pittsburg Cotton Oil Company, Pittsburg, Texas —Continued.				
	Double Circle Fertilizer 6-12-6 Guarantee	6.00	12.00	6.00	37.20
54420	Analysis	6.97	**10.69**	**5.46**	**37.18**
	Port Fertilizer Company, Los Fresnos, Texas				
	Valley Port Brand 15% Calcium Nitrate Guarantee	15.00	.....	.....	36.00
53668	Analysis	16.43	.....	.....	**39.43**
	Valley Port Brand 5-15-5 Fertilizer Guarantee	5.00	15.00	5.00	37.50
53665	Analysis	5.21	16.20	6.29	41.11
	Valley Port Brand 10-10-0 Fertilizer Guarantee	10.00	10.00	.....	37.00
53644	Analysis	10.05	11.03	.....	38.46
53663	Analysis	10.00	10.41	.....	37.53
	Valley Port Brand 11-48-0 Fertilizer Guarantee	11.00	48.00	.....	88.80
53638	Analysis	11.63	48.30	.....	90.70
53670	Analysis	11.51	**47.82**	.....	89.80
	Valley Port Brand 16-20-0 Fertilizer Guarantee	16.00	20.00	.....	64.40
53637	Analysis	**15.56**	**19.99**	.....	**63.33**
53645	Analysis	**14.50**	**18.09**	.....	**58.32**
53657	Analysis	**15.80**	**18.45**	.....	**61.91**
53671	Analysis	**15.98**	**19.73**	.....	**64.00**
	Valley Port Brand 20% Superphosphate Guarantee	.....	20.00	.....	26.00
53664	Analysis	.....	**19.74**	.....	**25.66**
	Valley Port Brand Urea Guarantee	40.00	.....	.....	96.00
53672	Analysis	40.31	.....	.....	96.74
	Valley Port Urea Meal Brand Fertilizer Guarantee	20.00	.....	.....	48.00
53666	Analysis	20.30	.....	.....	48.72
	The Pulverized Manure Company, Chicago, Illinois				
	Wizard Brand Pulverized Sheep Manure Guarantee	2.00	1.00	2.00	8.50
54258	Analysis	**1.84**	2.01	3.43	11.15
	San Benito Feed Company, San Benito, Texas				
	Keystone Brand 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53662	Analysis	**5.47**	9.32	6.27	32.77
	Shreveport Fertilizer Works, Shreveport, La.				
	Lion 3-10-3 Meal Formula Guarantee	3.00	10.00	3.00	23.80
54091	Analysis	3.01	10.02	**2.91**	**23.74**
54371	Analysis	3.28	10.09	3.07	24.67
	Lion 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53825	Analysis	4.11	**7.69**	4.09	**24.77**
53856	Analysis	4.19	8.04	4.44	25.84
53867	Analysis	4.16	8.02	4.04	25.26
53903	Analysis	4.16	**7.86**	4.01	25.01
54008	Analysis	4.79	8.05	**3.61**	26.30
54059	Analysis	4.56	9.17	4.38	28.12
54082	Analysis	4.41	8.09	**3.85**	25.72
54305	Analysis	4.56	8.81	4.61	27.92
54372	Analysis	4.04	**7.91**	4.17	24.98
54436	Analysis	4.20	8.23	**3.75**	25.28
54438	Analysis	4.68	8.08	4.02	26.55
54611	Analysis	4.01	8.07	4.15	25.09
54612	Analysis	4.16	8.63	4.92	27.10
54640	Analysis	4.20	8.01	4.21	25.54
54666	Analysis	4.67	**7.83**	4.16	26.38
	Lion 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53826	Analysis	4.27	8.04	6.27	28.22
53858	Analysis	4.16	**7.45**	6.34	27.28
53866	Analysis	4.13	**7.02**	6.21	**26.49**
53904	Analysis	4.33	8.07	6.13	28.24

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Shreveport Fertilizer Works, Shreveport, La.—Continued.				
	Lion 4-8-6 Fertilizer—Continued—Guarantee	4.00	8.00	6.00	27.20
54010	Analysis	4.21	8.23	6.04	28.05
54011	Analysis	4.08	8.28	6.19	27.98
54060	Analysis	4.02	8.31	5.32	26.83
54272	Analysis	4.75	9.28	3.79	28.01
54298	Analysis	4.22	8.03	6.03	27.81
54320	Analysis	4.13	8.44	6.12	28.22
54613	Analysis	4.13	8.43	6.04	28.12
54667	Analysis	4.19	8.07	5.81	27.52
	Lion 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
54140	Analysis	4.28	12.29	4.02	31.07
54265	Analysis	4.42	12.15	4.10	31.33
	Lion 6-9-3 Fertilizer Guarantee	6.00	9.00	3.00	29.70
54092	Analysis	6.21	8.78	3.35	30.33
	Lion 6-10-7 NPK 23 Guarantee	6.00	10.00	7.00	35.80
53857	Analysis	6.54	9.66	7.06	36.73
53905	Analysis	6.50	10.02	7.11	37.16
53920	Analysis	7.26	9.21	6.64	37.36
54125	Analysis	6.53	10.28	7.01	37.44
54141	Analysis	6.48	10.35	7.05	37.47
54319	Analysis	6.51	10.04	7.09	37.18
54346	Analysis	6.46	10.35	7.02	37.38
54373	Analysis	6.45	10.20	7.12	37.28
54443	Analysis	6.56	9.79	7.02	36.89
	Lion 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53919	Analysis	5.34	12.86	6.02	36.76
54124	Analysis	6.47	12.00	6.17	38.53
54150	Analysis	6.17	12.02	5.85	37.46
	Lion 10-0-10 Fertilizer Guarantee	10.00	.....	10.00	36.00
54603	Analysis	11.41	.....	12.10	41.90
	Longhorn 3-10-3 Meal Formula Guarantee	3.00	10.00	3.00	23.80
54084	Analysis	3.18	9.00	3.71	23.78
54109	Analysis	3.48	10.82	4.17	27.42
54144	Analysis	3.05	9.74	2.89	23.45
54592	Analysis	3.50	11.71	3.43	27.74
	Longhorn 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53755	Analysis	4.36	8.09	3.25	24.88
53843	Analysis	4.52	7.29	4.13	25.29
54344	Analysis	4.06	8.53	3.77	25.35
	Longhorn 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53842	Analysis	4.28	7.49	6.19	27.44
54226	Analysis	4.32	8.02	5.53	27.44
54370	Analysis	3.77	7.87	6.69	27.31
54573	Analysis	4.11	8.07	6.18	27.77
	Longhorn 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53718	Analysis	4.59	12.76	4.20	31.75
53840	Analysis	4.35	12.33	4.34	31.68
54065	Analysis	4.02	12.14	3.97	30.19
54069	Analysis	4.07	12.39	3.59	30.19
54129	Analysis	4.45	13.28	4.49	33.33
54157	Analysis	4.57	12.24	4.37	32.12
54574	Analysis	4.37	12.72	4.21	32.08
54593	Analysis	4.39	12.32	4.24	31.65
	Longhorn 6-9-3 Fertilizer Guarantee	6.00	9.00	3.00	29.70
54083	Analysis	6.06	8.98	3.06	29.88
	Longhorn 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53716	Analysis	6.30	10.54	7.04	37.27

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Shreveport Fertilizer Works, Shreveport, La.—Continued.				
	Longhorn 6-10-7 NPK-23 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53754	Analysis	6.58	10.17	7.06	37.48
53841	Analysis	6.23	9.84	7.05	36.20
54066	Analysis	6.53	10.04	7.30	37.48
54110	Analysis	6.54	10.14	6.95	37.22
54130	Analysis	6.53	10.24	7.35	37.80
54227	Analysis	6.24	10.09	7.39	36.97
54323	Analysis	6.15	10.43	7.04	36.77
54350	Analysis	6.20	10.45	6.52	36.29
54369	Analysis	6.23	10.37	6.81	36.60
	Longhorn 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53717	Analysis	5.95	12.41	5.48	36.99
	Longhorn 20% Superphosphate Guarantee	.....	20.00	.....	26.00
54343	Analysis	.....	20.31	.....	26.40
	Soil Builders, Inc., Orlando, Florida				
	Mineral Colloids Brand Soft Phosphate with Colloidal Clay Guarantee	.....	*22.00	.....	6.60
53946	Analysis	.....	*21.59	.....	6.48
	Swift & Company Fertilizer Works, Harvey and Shreveport, La., and Houston, Texas				
	Sulphate of Ammonia 20% Guarantee	20.00	.....	.....	48.00
53680	Analysis	20.22	.....	.....	48.53
	Swift's K. O. Non Acid Forming 6-8-8 Guarantee	6.00	8.00	8.00	34.40
53551	Analysis	5.39	7.58	8.06	32.46
53585	Analysis	6.04	7.66	8.04	34.11
53623	Analysis	5.98	7.73	8.04	34.05
53727	Analysis	5.70	8.15	7.35	33.10
54025	Analysis	6.06	8.13	7.77	34.43
54035	Analysis	6.04	8.26	7.57	34.32
54044	Analysis	5.80	8.59	7.26	33.80
54314	Analysis	5.97	8.06	7.82	34.19
54430	Analysis	6.08	7.68	7.18	33.19
54452	Analysis	6.08	8.05	7.57	34.14
54680	Analysis	5.86	8.05	8.17	34.33
	Swift's pH7 6-8-4 Guarantee	6.00	8.00	4.00	29.60
53490	Analysis	5.87	7.79	4.30	29.38
53584	Analysis	6.22	7.53	4.04	29.57
53610	Analysis	6.05	8.12	4.34	30.29
53626	Analysis	6.25	7.78	4.22	30.17
53631	Analysis	6.14	8.01	4.16	30.14
53651	Analysis	6.17	8.01	4.09	30.13
53658	Analysis	6.08	7.89	4.06	29.72
53701	Analysis	6.10	7.60	4.23	29.60
53722	Analysis	6.02	7.58	4.05	29.16
53728	Analysis	6.01	7.91	4.53	30.14
53735	Analysis	5.95	7.64	4.10	29.13
53771	Analysis	6.05	8.11	4.19	30.09
53790	Analysis	6.09	8.08	4.16	30.11
53798	Analysis	6.11	7.70	4.04	29.52
53809	Analysis	6.04	7.55	4.04	29.17
53836	Analysis	5.85	7.47	4.57	29.23
53887	Analysis	6.18	8.04	4.16	30.27
53915	Analysis	6.04	8.14	4.09	29.99
53939	Analysis	6.19	7.45	4.08	29.45
53954	Analysis	6.04	7.55	4.16	29.31
53968	Analysis	6.18	7.98	4.08	30.10
53988	Analysis	6.08	8.20	4.07	30.13
54034	Analysis	6.09	7.82	4.17	29.79

*Total phosphoric acid

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Swift & Company Fertilizer Works, Harvey and Shreveport, La., and Houston, Texas—Continued.				
	Swift's pH7 6-8-4—Continued—Guarantee	6.00	8.00	4.00	29.60
54052	Analysis	6.22	8.02	4.07	30.24
54061	Analysis	6.08	8.70	4.25	31.00
54102	Analysis	6.18	8.00	4.12	30.17
54204	Analysis	**5.92**	8.99	4.10	30.82
54236	Analysis	6.11	**7.82**	4.08	29.73
54240	Analysis	6.09	**7.93**	4.06	29.80
54251	Analysis	6.04	8.27	4.11	30.18
54262	Analysis	6.15	**7.75**	4.11	29.77
54269	Analysis	**5.99**	8.53	4.04	30.32
54296	Analysis	6.08	8.05	4.13	30.02
54330	Analysis	5.88	**7.72**	4.14	**29.12**
54341	Analysis	**5.78**	**7.71**	4.17	**28.89**
54398	Analysis	6.12	**7.76**	**3.78**	**29.32**
54429	Analysis	**5.83**	**7.80**	4.21	**29.18**
54439	Analysis	6.21	8.01	4.16	30.30
54453	Analysis	**5.97**	**7.54**	4.09	**29.04**
54470	Analysis	6.19	8.07	**3.81**	29.92
54523	Analysis	**5.86**	**7.85**	4.08	**29.17**
54569	Analysis	**5.73**	8.20	4.04	**29.26**
54581	Analysis	**5.91**	8.75	4.47	30.92
54598	Analysis	**5.86**	8.35	4.04	29.77
54621	Analysis	6.07	8.32	4.47	30.75
	Swift's Red Steer 0-12-4 Guarantee	.....	12.00	4.00	20.40
54166	Analysis	.....	**11.56**	4.11	**19.96**
54540	Analysis	.....	12.17	**3.96**	20.57
	Swift's Red Steer Brand 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
54120	Analysis	3.04	**9.02**	3.41	**23.12**
54179	Analysis	3.08	10.24	3.04	24.35
54241	Analysis	3.02	**9.62**	3.23	**23.64**
54599	Analysis	3.14	10.34	3.51	25.19
	Swift's Red Steer Brand 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53699	Analysis	**3.92**	8.28	4.21	25.22
53702	Analysis	4.02	8.19	4.25	25.40
53721	Analysis	**3.91**	**7.61**	4.24	**24.36**
53796	Analysis	**3.77**	**7.51**	4.05	**23.67**
53806	Analysis	4.14	8.13	4.04	25.36
53890	Analysis	4.07	**7.81**	4.17	24.92
53918	Analysis	4.16	8.13	4.12	25.49
53938	Analysis	4.10	**7.68**	4.10	**24.74**
53940	Analysis	4.23	**7.76**	4.08	25.14
54062	Analysis	4.08	**7.70**	4.12	**24.74**
54101	Analysis	4.08	**7.74**	4.10	**24.77**
54134	Analysis	5.29	9.50	5.33	31.45
54190	Analysis	**3.96**	12.46	4.16	30.69
54197	Analysis	**3.90**	8.77	**3.95**	25.50
54203	Analysis	4.08	8.41	4.29	25.87
54304	Analysis	4.08	**7.79**	4.14	24.89
54329	Analysis	**3.95**	8.13	4.14	25.02
54342	Analysis	**3.87**	**7.73**	4.13	**24.30**
54352	Analysis	**3.79**	8.10	5.02	25.65
54366	Analysis	**3.83**	8.29	**3.97**	**24.73**
54376	Analysis	**3.50**	9.23	**3.62**	**24.74**
54414	Analysis	4.07	8.31	4.03	25.41
54431	Analysis	4.15	**7.79**	4.31	25.26
54466	Analysis	4.13	8.63	4.37	26.37
54498	Analysis	4.08	8.35	4.10	25.57
54521	Analysis	4.12	8.02	4.01	25.13
54539	Analysis	**3.84**	**7.87**	4.41	**24.74**
54576	Analysis	4.02	8.03	**3.77**	**24.61**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Swift & Company Fertilizer Works, Harvey and Shreveport, La., and Houston, Texas—Continued.				
	Swift's Red Steer Brand 4-8-4 Fertilizer—Continued—				
	Guarantee	4.00	8.00	4.00	24.80
54620	Analysis	4.10	**7.78**	4.24	25.04
54686	Analysis	4.12	**7.68**	4.26	24.98
	Swift's Red Steer Brand 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53545	Analysis	**4.00**	**7.91**	**5.84**	**26.89**
53808	Analysis	**4.18**	**7.74**	**5.76**	**27.00**
53820	Analysis	4.07	**7.91**	6.23	27.53
53835	Analysis	4.12	8.11	**5.68**	27.25
53844	Analysis	4.06	8.00	6.19	27.57
53888	Analysis	**3.92**	**7.56**	6.10	**26.56**
53953	Analysis	**3.83**	**7.63**	**5.60**	**25.83**
53957	Analysis	4.01	**7.73**	**5.77**	**26.59**
53977	Analysis	4.09	8.00	6.35	27.84
53984	Analysis	**3.93**	**7.46**	**5.89**	**26.20**
54242	Analysis	4.07	**7.45**	**5.83**	**26.46**
54270	Analysis	4.02	8.07	**5.75**	**27.04**
54413	Analysis	4.23	8.05	5.85	27.64
54432	Analysis	4.02	8.02	**5.63**	**26.84**
54445	Analysis	4.06	**7.78**	6.14	27.22
54623	Analysis	**3.89**	8.03	6.02	27.00
54659	Analysis	4.42	**7.76**	6.33	28.30
	Swift's Red Steer Brand 4-8-10 Fertilizer Guarantee	4.00	8.00	10.00	32.00
53845	Analysis	**3.94**	8.58	**8.44**	**30.74**
54622	Analysis	4.15	**7.41**	10.37	32.03
54658	Analysis	4.25	8.07	10.10	32.81
	Swifts Red Steer Brand 4-10-0 Fertilizer Guarantee	4.00	10.00	.....	22.60
53583	Analysis	4.26	**9.31**	.....	**22.32**
53595	Analysis	4.50	10.71	.....	24.72
53839	Analysis	4.05	**9.57**	.....	**22.16**
	Swift's Red Steer Brand 4-10-7 Fertilizer Guarantee	4.00	10.00	7.00	31.00
53546	Analysis	4.03	**9.17**	8.02	31.21
54536	Analysis	**3.97**	10.67	**5.35**	**29.82**
	Swift's Red Steer Brand 4-12-4 Fertilizer Guarantee	4.00	12.00	4.00	30.00
53507	Analysis	4.19	**11.60**	4.73	30.82
53552	Analysis	4.14	**11.30**	4.21	**29.68**
53624	Analysis	4.24	**11.00**	4.49	**29.87**
53698	Analysis	4.00	**11.23**	4.21	**29.25**
53720	Analysis	4.04	**11.29**	4.10	**29.30**
53741	Analysis	4.17	**11.13**	4.18	**29.50**
53795	Analysis	**3.98**	**11.13**	4.15	**29.60**
53846	Analysis	4.15	**11.42**	4.06	**29.68**
53893	Analysis	4.57	**11.06**	4.22	30.41
53952	Analysis	4.18	**11.52**	4.07	**29.89**
53956	Analysis	4.20	**11.30**	4.07	**29.65**
54043	Analysis	4.07	**11.17**	4.36	**29.52**
54165	Analysis	**3.95**	**11.55**	4.13	**29.46**
54180	Analysis	4.08	**11.60**	4.02	**29.69**
54189	Analysis	4.22	**11.82**	4.01	30.31
54202	Analysis	4.21	12.04	4.22	30.81
54216	Analysis	**3.85**	12.25	4.03	30.01
54217	Analysis	**3.96**	**11.06**	4.11	**28.81**
54260	Analysis	**4.30**	**9.57**	5.09	**28.87**
54353	Analysis	**3.68**	12.14	**3.58**	**28.91**
54374	Analysis	**3.73**	12.20	4.08	**29.71**
54522	Analysis	4.00	**11.40**	5.30	30.78
54537	Analysis	**3.62**	12.25	4.10	**29.54**
54570	Analysis	**4.17**	12.05	**4.04**	30.53
54597	Analysis	4.36	13.51	**3.16**	31.81

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Potash, phosphoric acid, per cent	Available per cent	Valuation found, per ton
	Swift & Company Fertilizer Works, Harvey and Shreveport, La., and Houston, Texas—Continued.				
	Swift's Red Steer Brand 5-15-0 Fertilizer Guarantee	5.00	15.00	.....	31.50
53487	Analysis	**4.83**	**13.69**	.....	**29.39**
53489	Analysis	5.15	**14.06**	.....	**30.65**
	Swift's Red Steer Brand 5-15-5 Fertilizer Guarantee	5.00	15.00	5.00	37.50
53612	Analysis	5.07	**14.00**	6.05	**36.42**
53618	Analysis	5.01	**13.62**	5.25	**36.03**
53650	Analysis	5.08	**14.02**	5.14	**36.59**
	Swift's Red Steer Brand 6-9-3 Fertilizer Guarantee	6.00	9.00	3.00	29.70
53772	Analysis	**5.90**	**8.70**	4.29	30.62
53838	Analysis	**5.39**	10.44	4.12	31.45
54271	Analysis	6.03	9.05	3.06	29.91
	Swift's Red Steer Brand 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53582	Analysis	6.16	**9.91**	**6.90**	35.94
53729	Analysis	6.16	10.20	**6.46**	**35.79**
53788	Analysis	6.19	**9.45**	**6.61**	**35.08**
53797	Analysis	6.02	**9.88**	**6.77**	**35.41**
	Swift's Red Steer Brand 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53491	Analysis	6.00	**11.32**	6.13	**36.48**
53494	Analysis	**5.84**	**11.60**	6.72	**37.16**
53497	Analysis	6.06	**11.46**	6.54	37.29
53506	Analysis	**5.14**	**9.13**	7.02	**32.63**
53596	Analysis	**5.83**	**11.51**	5.77	35.87
53627	Analysis	**5.91**	**11.56**	6.02	**36.43**
53700	Analysis	6.04	**11.58**	6.02	**36.77**
53734	Analysis	**5.67**	**11.61**	7.17	37.30
53742	Analysis	6.09	**11.56**	6.20	**37.09**
53803	Analysis	6.00	**11.63**	6.06	**36.79**
54368	Analysis	6.08	12.16	**5.76**	37.31
54559	Analysis	**5.63**	**11.78**	**5.56**	**35.49**
	Swift's Red Steer Brand 10-20-0 Fertilizer Guarantee	10.00	20.00	.....	50.00
53632	Analysis	**9.90**	**18.65**	.....	**48.01**
	Swift's Red Steer 10-20-10 Fertilizer Guarantee	10.00	20.00	10.00	62.00
53611	Analysis	**9.07**	**19.45**	**8.51**	**57.27**
53653	Analysis	**9.98**	**19.21**	10.23	**61.20**
	Swift's Red Steer 16-20-0 Fertilizer Guarantee	16.00	20.00	.....	64.40
53488	Analysis	**15.68**	**19.55**	.....	**63.05**
	Swift's Red Steer Brand 18% Superphosphate Fertilizer Guarantee	.....	18.00	.....	23.40
53807	Analysis	.....	18.05	.....	23.47
53889	Analysis	.....	18.22	.....	23.69
54237	Analysis	.....	18.74	.....	24.36
54538	Analysis	.....	**17.74**	.....	**23.06**
	Swift's Red Steer Brand 20% Superphosphate Fertilizer Guarantee	.....	20.00	.....	26.00
53625	Analysis	.....	20.61	.....	26.79
53719	Analysis	.....	**19.46**	.....	**25.30**
54181	Analysis	.....	21.51	.....	27.96
	Swift's Red Steer Tomato Grower 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53652	Analysis	6.74	**9.42**	**6.74**	36.52
53773	Analysis	6.08	10.50	7.11	36.77
53810	Analysis	**5.80**	**9.50**	**6.44**	**34.00**
53847	Analysis	**5.86**	**9.56**	7.18	**35.11**
53907	Analysis	6.01	**9.75**	7.24	**35.79**
54273	Analysis	**5.97**	10.02	**6.73**	**35.44**
54367	Analysis	**5.51**	10.84	**6.34**	**34.92**
54497	Analysis	**5.38**	10.43	7.37	**35.31**
	Vigoro Guarantee	4.00	12.00	4.00	30.00
53677	Analysis	**3.72**	12.48	**3.74**	**29.64**
53837	Analysis	4.38	**10.61**	4.81	30.07
54252	Analysis	4.35	**10.01**	4.34	**28.66**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Number Laboratory	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Synthetic Nitrogen Products Corporation New York, New York				
	Calcium Nitrate (Nitrate of Lime) Guarantee	15.00	.....	.....	36.00
53640	Analysis	15.20	.....	.....	36.48
	Temple Cotton Oil Company, North Little Rock, Arkansas				
	Quapaw 3-10-3 Guarantee	3.00	10.00	3.00	23.80
54055	Analysis	**2.86**	**9.51**	3.22	**23.08**
	Quapaw 4-8-4 Guarantee	4.00	8.00	4.00	24.80
54049	Analysis	4.06	**7.81**	4.04	**24.74**
54057	Analysis	4.00	**7.70**	4.17	**24.61**
54435	Analysis	4.06	**7.35**	4.04	**24.15**
54473	Analysis	**3.98**	8.16	**3.61**	**24.49**
54664	Analysis	4.02	**7.65**	4.00	**24.40**
54669	Analysis	**3.74**	8.03	**3.72**	**23.88**
	Quapaw 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53998	Analysis	**3.97**	**7.77**	6.00	**26.83**
54018	Analysis	**3.84**	8.22	6.09	27.22
54047	Analysis	**3.93**	**7.74**	**5.23**	**25.77**
54051	Analysis	4.19	8.02	**5.07**	**26.57**
54056	Analysis	**3.94**	**7.94**	6.00	**26.98**
	Quapaw 6-10-7 Guarantee	6.00	10.00	7.00	35.80
54046	Analysis	**5.58**	**9.64**	7.06	**34.39**
	Quapaw 6-12-6 Guarantee	6.00	12.00	6.00	37.20
54050	Analysis	**5.64**	**11.79**	6.04	**36.12**
	Tennessee Corporation, Lockland, Ohio				
	Loma Guarantee	5.00	10.00	4.00	29.80
54302	Analysis	**4.97**	10.40	4.02	30.27
	Texas Farm Products Company, Nacogdoches, Texas				
	Lone Star Brand 3-10-3 Fertilizer Guarantee	3.00	10.00	3.00	23.80
53705	Analysis	3.09	**9.81**	3.24	24.06
54067	Analysis	3.26	**9.76**	3.10	24.23
54073	Analysis	3.19	**9.89**	3.35	24.54
54148	Analysis	3.18	**9.71**	3.12	23.99
54185	Analysis	3.11	**9.92**	3.06	24.03
54360	Analysis	**2.95**	**9.60**	3.02	**23.18**
54494	Analysis	3.10	**9.68**	3.02	**23.64**
	Lone Star Brand 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53707	Analysis	4.05	**7.76**	4.21	24.86
53758	Analysis	4.12	**7.58**	4.14	**24.71**
53766	Analysis	4.07	8.00	4.16	25.16
53782	Analysis	**3.89**	**7.52**	4.12	**24.96**
53794	Analysis	**3.98**	8.05	4.23	25.10
53817	Analysis	4.01	**7.45**	4.06	**24.18**
53849	Analysis	**3.87**	**7.76**	4.34	**24.59**
53909	Analysis	4.05	**7.81**	4.31	25.04
53910	Analysis	4.09	8.11	4.33	25.56
54039	Analysis	4.10	8.08	4.04	25.19
54068	Analysis	4.05	8.09	4.40	25.52
54072	Analysis	**3.87**	**7.66**	**3.88**	**23.91**
54081	Analysis	**3.87**	**7.85**	4.19	**24.53**
54126	Analysis	**3.93**	**7.47**	4.23	**24.22**
54137	Analysis	**3.95**	8.04	4.06	24.80
54159	Analysis	4.04	8.34	**3.73**	25.02
54215	Analysis	**3.92**	**7.63**	**3.83**	**23.93**
54243	Analysis	4.08	**7.87**	**3.94**	**24.75**
54293	Analysis	4.10	8.28	4.25	25.70
54299	Analysis	4.06	8.26	4.30	25.64
54316	Analysis	4.00	**7.73**	4.08	**24.55**
54327	Analysis	4.06	8.32	4.18	25.58
54361	Analysis	**3.97**	8.10	**3.84**	**24.67**
54479	Analysis	**3.76**	8.07	**3.84**	**24.12**
54495	Analysis	4.01	8.32	4.04	25.29

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Texas Farm Products Company, Nacogdoches, Texas —Continued.				
	Lone Star Brand 4-8-4 Fertilizer—Continued—				
	Guarantee	4.00	8.00	4.00	24.80
54606	Analysis	**3.86**	8.25	**3.77**	**24.51**
54609	Analysis	**3.93**	8.27	4.04	25.03
	Lone Star Brand 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
53703	Analysis	4.04	**7.73**	6.13	**27.11**
53762	Analysis	4.18	**7.66**	6.02	27.21
53818	Analysis	4.18	8.04	6.02	27.70
53848	Analysis	4.08	**7.42**	6.28	**26.98**
53911	Analysis	4.17	8.29	**5.73**	27.67
54029	Analysis	4.08	8.06	6.09	27.58
54138	Analysis	4.05	**7.74**	6.14	**27.15**
54210	Analysis	4.13	8.03	6.31	27.92
54317	Analysis	4.09	8.03	6.12	27.60
54318	Analysis	4.02	**7.80**	6.03	**27.03**
54359	Analysis	4.02	8.31	**5.43**	**26.97**
54434	Analysis	4.11	**7.77**	6.04	27.21
	Lone Star Brand 4-10-0 Fertilizer Guarantee	4.00	10.00	.....	22.60
53768	Analysis	4.05	**9.40**	.....	**21.94**
	Lone Star Brand 4-12-4 Fertilizer	4.00	12.00	4.00	30.00
53706	Analysis	4.23	**11.67**	4.26	30.43
53756	Analysis	4.14	**11.56**	4.34	30.18
53764	Analysis	4.19	**11.65**	4.25	30.31
53791	Analysis	4.05	**11.53**	4.22	**29.77**
53792	Analysis	4.06	**11.47**	4.28	**29.79**
54038	Analysis	4.02	12.06	4.11	30.26
54074	Analysis	4.25	12.34	4.03	31.08
54097	Analysis	4.08	12.07	4.05	30.34
54113	Analysis	**3.97**	12.01	**4.02**	**29.96**
54123	Analysis	4.18	**11.93**	4.31	30.71
54127	Analysis	4.23	12.03	4.19	30.82
54132	Analysis	4.03	12.00	4.18	30.29
54133	Analysis	4.26	**11.43**	4.05	**29.94**
54136	Analysis	4.08	12.29	4.09	30.68
54149	Analysis	4.12	**11.66**	4.18	30.07
54186	Analysis	4.32	**11.77**	4.26	30.78
54201	Analysis	4.27	**11.63**	4.03	30.21
54275	Analysis	4.09	12.02	4.02	30.27
54337	Analysis	4.12	**11.46**	4.24	**29.88**
54362	Analysis	4.02	**11.90**	4.03	**29.96**
54568	Analysis	4.03	12.07	4.06	30.23
	Lone Star Brand 6-8-4 Fertilizer Guarantee	6.00	8.00	4.00	29.60
54277	Analysis	6.15	8.35	**3.80**	30.18
	Lone Star Brand 6-9-3 Fertilizer Guarantee	6.00	9.00	3.00	29.70
53767	Analysis	**5.94**	**8.56**	3.06	**29.06**
53815	Analysis	6.03	9.03	3.23	30.09
54098	Analysis	**5.88**	9.02	3.24	29.73
54345	Analysis	**5.90**	9.30	3.04	29.90
54604	Analysis	**5.82**	9.07	3.02	**29.38**
	Lone Star Brand 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
53757	Analysis	6.08	**9.83**	7.01	**35.78**
53763	Analysis	6.00	10.15	7.12	36.14
53783	Analysis	**5.72**	10.64	**6.57**	**35.44**
53793	Analysis	6.00	**9.72**	7.01	**35.45**
53816	Analysis	**5.91**	10.08	7.00	**35.68**
53850	Analysis	6.03	10.04	7.04	35.97
53908	Analysis	**5.98**	**9.80**	7.11	**35.62**
54037	Analysis	6.00	10.09	7.01	35.93
54075	Analysis	**5.91**	10.14	**6.72**	**35.42**
54079	Analysis	6.03	10.07	**6.77**	**35.68**
54121	Analysis	**5.96**	**9.91**	7.01	**35.59**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Available phosphoric acid, per cent	Valuation found, per ton
	Texas Farm Products Company, Nacogdoches, Texas —Continued.				
	Lone Star Brand 6-10-7 Fertilizer—Continued—				
	Guarantee	6.00	10.00	7.00	35.80
54122	Analysis	**5.98**	10.03	7.07	35.87
54153	Analysis	**5.81**	10.11	**6.73**	**35.16**
54205	Analysis	**5.92**	10.03	7.07	**35.73**
54276	Analysis	**5.63**	10.30	**6.49**	**34.69**
54336	Analysis	**5.83**	10.13	7.06	**35.63**
54363	Analysis	**5.91**	10.04	**6.78**	**35.37**
54607	Analysis	6.35	**9.69**	**6.43**	**35.56**
54682	Analysis	**5.76**	10.18	7.06	**35.52**
	Lone Star Brand 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
53704	Analysis	6.00	**11.40**	6.56	**37.09**
53765	Analysis	**5.87**	**11.63**	6.25	**36.71**
53814	Analysis	6.04	12.01	6.09	37.42
54177	Analysis	**5.91**	12.11	6.04	**37.17**
	Lone Star Brand 10-10-0 Guarantee	10.00	10.00	.....	37.00
54364	Analysis	10.02	10.15	.....	37.25
54605	Analysis	**9.77**	10.55	.....	37.17
	Lone Star 20% Superphosphate Guarantee	.....	20.00	.....	26.00
54175	Analysis	.....	20.84	.....	27.09
54365	Analysis	.....	20.17	.....	26.22
	Tri-State Fertilizer & Lumber Company, Shreveport, La.				
	Red Diamond 4-8-4 Fertilizer Guarantee	4.00	8.00	4.00	24.80
53982	Analysis	4.45	8.60	4.75	27.56
54401	Analysis	4.26	8.18	**3.54**	25.10
	Red Diamond 4-8-6 Fertilizer Guarantee	4.00	8.00	6.00	27.20
54402	Analysis	4.11	**9.10**	**5.58**	28.39
54478	Analysis	4.12	8.01	7.14	28.87
54641	Analysis	**3.61**	10.11	**4.82**	27.58
54655	Analysis	4.02	8.40	6.43	28.29
	Red Diamond 6-8-8 Fertilizer Guarantee	6.00	8.00	8.00	34.40
54654	Analysis	6.28	8.31	**7.22**	34.53
	Red Diamond 6-10-7 Fertilizer Guarantee	6.00	10.00	7.00	35.80
54427	Analysis	6.78	**9.46**	7.90	38.05
	Red Diamond 6-12-6 Fertilizer Guarantee	6.00	12.00	6.00	37.20
54653	Analysis	6.70	**11.05**	6.18	37.87
	Tyler Fertilizer Company, Tyler, Texas				
	Heart Brand Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53832	Analysis	4.08	8.79	4.46	26.57
53886	Analysis	**3.89**	8.94	4.08	25.86
54670	Analysis	**3.84**	**7.75**	**3.79**	**23.85**
	Heart Brand Fertilizer 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53830	Analysis	4.02	**7.39**	6.62	**27.08**
53885	Analysis	**3.87**	**7.37**	6.21	**26.32**
54288	Analysis	4.22	**7.26**	6.07	**26.85**
	Heart Brand Fertilizer 4-8-10 Guarantee	4.00	8.00	10.00	32.00
54290	Analysis	4.19	8.50	**7.28**	**29.85**
	Heart Brand Fertilizer 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53831	Analysis	4.08	12.23	**3.11**	**29.42**
54289	Analysis	4.12	**11.43**	4.24	**29.84**
	Heart Brand Fertilizer 6-8-4 Guarantee	6.00	8.00	4.00	29.60
54291	Analysis	**5.14**	8.47	**3.51**	**27.56**
	Heart Brand Fertilizer 6-9-3 Guarantee	6.00	9.00	3.00	29.70
53897	Analysis	**5.77**	**8.68**	3.48	**29.31**
54292	Analysis	**5.66**	8.44	3.36	**28.58**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Tyler Fertilizer Company, Tyler, Texas—Continued.				
	Heart Brand Fertilizer 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53829	Analysis	**5.66**	10.06	**6.28**	**34.20**
54228	Analysis	6.09	**9.57**	7.05	**35.52**
54287	Analysis	**5.66**	10.23	7.56	35.95
54661	Analysis	6.27	**8.92**	**6.58**	**34.55**
	Eighteen Per Cent Superphosphate Guarantee	.....	18.00	.....	23.40
53833	Analysis	.....	18.16	.....	23.61
	Twenty Per Cent Superphosphate Guarantee	.....	20.00	.....	26.00
53834	Analysis	.....	**19.72**	.....	**25.64**
	United Chemical Company, Dallas, Texas				
	"King Cotton" Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
54586	Analysis	4.13	**7.70**	**2.38**	**22.78**
	Rice Makers Fertilizer 4-10-0 Guarantee	4.00	10.00	.....	22.60
54565	Analysis	**3.95**	10.03	.....	**22.52**
	"Sunset Brand" Fertilizer 3-10-3 Guarantee	3.00	10.00	3.00	23.80
54085	Analysis	3.17	10.13	3.08	24.48
54482	Analysis	**2.98**	10.08	**2.98**	**23.72**
	"Sunset Brand" Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53709	Analysis	4.27	8.29	4.34	26.24
53724	Analysis	4.05	8.07	8.26	30.12
53958	Analysis	4.17	**7.69**	**3.79**	**24.56**
54087	Analysis	**3.90**	8.24	**3.68**	**24.49**
54193	Analysis	4.18	**7.67**	4.05	24.86
54311	Analysis	4.15	8.04	4.25	25.51
54325	Analysis	4.17	8.29	**3.85**	25.41
54404	Analysis	**3.93**	8.57	4.08	25.47
54580	Analysis	4.21	8.24	**3.97**	25.57
	"Sunset Brand" Fertilizer 4-10-0 Guarantee	4.00	10.00	.....	22.60
54245	Analysis	**3.91**	**9.80**	.....	**22.12**
	"Sunset Brand" Fertilizer 4-10-7 Guarantee	4.00	10.00	7.00	31.00
54249	Analysis	4.04	10.37	**6.84**	31.39
	"Sunset Brand" Fertilizer 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53708	Analysis	4.33	**11.62**	4.25	30.60
53726	Analysis	4.10	**11.54**	4.55	30.30
54015	Analysis	4.06	**11.73**	4.34	30.20
54086	Analysis	4.06	**11.64**	**3.93**	**29.59**
54118	Analysis	4.14	12.02	4.24	30.66
54128	Analysis	4.20	12.02	4.39	30.98
54192	Analysis	4.27	**11.65**	4.19	30.43
54230	Analysis	**3.95**	12.65	**3.64**	30.30
54254	Analysis	4.17	12.26	**3.70**	30.39
54403	Analysis	4.43	12.19	4.04	31.33
	"Sunset Brand" Fertilizer 6-9-3 Guarantee	6.00	9.00	3.00	29.70
53860	Analysis	6.16	9.06	3.59	30.88
54253	Analysis	6.14	9.10	**2.83**	29.97
	"Sunset Brand" Fertilizer 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53725	Analysis	**5.86**	10.05	**6.54**	**34.98**
54156	Analysis	6.16	10.20	**6.42**	**35.74**
54481	Analysis	6.26	10.00	**5.35**	**34.44**
	"Sunset Brand" Fertilizer 6-12-6 Guarantee	6.00	12.00	6.00	37.20
53859	Analysis	6.34	**11.46**	6.93	38.44
54248	Analysis	6.01	12.70	6.10	38.25
54324	Analysis	6.18	12.27	**5.72**	37.64
54334	Analysis	6.08	**11.82**	**4.21**	**35.01**
	Sunset Brand Fertilizer "Truck and Fruit Special" 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53916	Analysis	4.30	8.04	7.42	**29.67**
53972	Analysis	4.12	8.10	7.84	29.83

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	United Chemical Company, Dallas, Texas—Continued.				
	Sunset Brand Fertilizer "Truck and Fruit Special" 4-8-6—Continued—Guarantee	4.00	8.00	6.00	27.20
54145	Analysis	**3.91**	**7.49**	6.33	**26.72**
54328	Analysis	4.20	**7.75**	9.69	31.79
54412	Analysis	4.01	9.12	6.19	28.91
	Sunset Brand Fertilizer 18% Superphosphate Guarantee	.....	18.00	.....	23.40
53917	Analysis	.....	19.23	.....	25.00
	"United Plantfood" Fertilizer 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53928	Analysis	4.20	**7.70**	4.04	24.94
53945	Analysis	4.13	8.09	4.05	25.29
53980	Analysis	4.08	8.19	4.16	25.43
54250	Analysis	4.12	8.35	**3.89**	25.42
54306	Analysis	4.18	8.04	4.00	25.28
54395	Analysis	4.18	8.55	**3.69**	25.58
54535	Analysis	**3.83**	8.25	**3.51**	**24.13**
54677	Analysis	4.30	8.00	4.28	25.86
	"United Plantfood" Fertilizer 4-10-0 Rice Special Guarantee	4.00	10.00	.....	22.60
54552	Analysis	4.14	**9.85**	.....	22.75
54555	Analysis	4.03	**9.75**	.....	**22.35**
54562	Analysis	**3.65**	**9.98**	.....	**21.73**
	"United Plantfood" Fertilizer 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53695	Analysis	4.22	**11.74**	4.49	30.78
53748	Analysis	4.13	**11.59**	4.39	30.25
54199	Analysis	4.06	12.46	4.22	31.00
54221	Analysis	4.08	12.20	4.13	30.61
54356	Analysis	4.04	**11.88**	4.04	**29.99**
	"United Plantfood" Fertilizer 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53749	Analysis	6.01	10.05	7.03	35.93
53929	Analysis	6.19	10.15	7.39	36.93
54045	Analysis	6.19	10.40	7.07	36.86
54255	Analysis	6.36	**9.92**	7.02	36.58
54355	Analysis	6.21	10.24	7.09	36.72
	"United Plantfood" Fertilizer 6-12-6 Guarantee	6.00	12.00	6.00	37.20
53531	Analysis	6.02	**11.78**	6.69	37.79
53740	Analysis	6.07	12.01	**5.86**	37.21
53750	Analysis	6.28	12.13	**5.75**	37.74
54354	Analysis	6.13	12.01	6.09	37.63
	"United Plantfood" Fertilizer Truck and Fruit Special 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53872	Analysis	**3.74**	8.01	6.29	**26.94**
53926	Analysis	4.23	**7.51**	8.59	30.22
54170	Analysis	**3.57**	8.38	6.57	27.34
54465	Analysis	4.38	8.02	6.44	28.67
	"United Plantfood" 18% Superphosphate Guarantee	.....	18.00	.....	23.40
53751	Analysis	.....	18.41	.....	23.93
	"United Plantfood" 20% Superphosphate Guarantee	.....	20.00	.....	26.00
53530	Analysis	.....	20.47	.....	26.61
	Virginia-Carolina Chemical Corporation, Shreveport, La.				
	Kainit 20% Guarantee	.....	.....	20.00	24.00
53560	Analysis	.....	.....	**19.44**	**23.33**
	V-C Blood, Bone & Potash Guarantee	3.00	10.00	3.00	23.80
54503	Analysis	3.15	10.09	3.35	24.70
	V-C Fertilizers 3-10-3 Guarantee	3.00	10.00	3.00	23.80
54143	Analysis	3.05	10.58	3.21	24.92
54235	Analysis	3.25	10.38	3.04	24.94
54595	Analysis	3.20	10.37	3.37	25.20

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Virginia-Carolina Chemical Corporation, Shreveport, La. —Continued.				
	V-C Fertilizers 4-8-4 Guarantee	4.00	8.00	4.00	24.80
53567	Analysis	4.09	**7.97**	4.28	25.32
53784	Analysis	**3.95**	**7.91**	4.16	**24.75**
53967	Analysis	4.13	8.45	4.36	26.13
54003	Analysis	4.16	8.51	4.32	26.22
54024	Analysis	4.22	8.52	4.91	27.10
54041	Analysis	4.11	8.28	4.21	25.67
54089	Analysis	4.19	8.11	4.00	25.40
54108	Analysis	4.02	8.14	4.22	25.29
54247	Analysis	4.08	8.31	4.33	25.79
54347	Analysis	4.02	8.15	4.12	25.19
54433	Analysis	4.09	8.43	4.36	26.01
54468	Analysis	4.18	8.39	4.06	25.81
54474	Analysis	4.94	8.27	4.07	27.49
54477	Analysis	4.18	8.68	4.19	26.34
54483	Analysis	4.11	8.65	4.02	25.93
54506	Analysis	4.03	8.10	4.26	25.31
54596	Analysis	4.01	8.13	4.06	25.06
54619	Analysis	4.09	8.59	4.21	26.04
54635	Analysis	4.04	8.42	4.09	25.56
	V-C Fertilizers 4-8-6 Guarantee	4.00	8.00	6.00	27.20
53563	Analysis	4.12	**7.49**	6.38	27.29
53966	Analysis	4.15	8.49	6.15	28.38
54014	Analysis	4.18	8.27	6.28	28.32
54023	Analysis	4.23	8.02	6.40	28.26
54036	Analysis	4.31	8.84	6.25	29.33
54058	Analysis	4.13	8.00	6.30	27.87
54064	Analysis	4.35	8.55	6.14	28.93
54322	Analysis	4.05	8.09	6.18	27.66
54421	Analysis	4.18	8.44	6.21	28.45
54476	Analysis	4.21	**7.60**	6.38	27.64
54490	Analysis	4.25	8.61	6.34	29.00
54634	Analysis	4.27	**7.60**	6.29	27.68
54651	Analysis	4.04	**7.65**	6.06	**26.92**
54668	Analysis	4.28	8.51	6.16	28.72
54672	Analysis	4.12	8.02	**5.92**	27.42
	V-C Fertilizers 4-10-7 Guarantee	4.00	10.00	7.00	31.00
54500	Analysis	4.21	10.44	7.39	32.54
54588	Analysis	4.20	**9.51**	7.40	31.32
	V-C Fertilizers 4-12-4 Guarantee	4.00	12.00	4.00	30.00
53565	Analysis	4.26	**11.75**	4.74	31.19
53819	Analysis	4.17	**11.44**	4.71	30.53
54063	Analysis	4.31	12.49	4.47	31.94
54090	Analysis	4.06	**11.78**	4.48	30.43
54107	Analysis	4.18	12.62	4.39	31.71
54234	Analysis	4.24	12.70	4.30	31.85
54244	Analysis	4.34	12.65	4.38	32.13
54321	Analysis	4.27	12.26	4.41	31.48
54390	Analysis	4.21	12.70	4.23	31.69
54594	Analysis	4.07	**11.35**	4.22	**29.59**
	V-C Fertilizers 6-8-4 Guarantee	6.00	8.00	4.00	29.60
53895	Analysis	**5.88**	8.82	4.10	30.50
54004	Analysis	6.05	8.33	4.15	30.33
54491	Analysis	6.06	8.62	4.14	30.72
	V-C Fertilizers 6-8-8 Guarantee	6.00	8.00	8.00	34.40
54650	Analysis	6.07	8.21	8.13	35.00
	V-C Fertilizers 6-9-3 Guarantee	6.00	9.00	3.00	29.70
53823	Analysis	6.02	9.04	3.28	30.14
54088	Analysis	**5.64**	9.03	3.04	**28.93**

Table 8. Analysis of commercial fertilizer, season 1938-39—Continued

Laboratory Number	Manufacturer, place of business and brand	Nitrogen per cent	Available phosphoric acid, per cent	Potash, per cent	Valuation found, per ton
	Virginia-Carolina Chemical Corporation, Shreveport, La. —Continued.				
	V-C Fertilizers 6-10-7 Guarantee	6.00	10.00	7.00	35.80
53785	Analysis	6.22	**9.24**	7.33	**35.74**
53824	Analysis	6.20	**9.50**	7.39	36.10
53927	Analysis	6.02	**9.82**	7.41	36.11
54006	Analysis	6.20	10.06	7.26	36.67
54080	Analysis	**5.76**	10.13	**6.53**	**34.83**
54348	Analysis	6.37	10.85	7.23	38.08
54608	Analysis	6.38	10.02	7.44	37.27
	V-C Fertilizers 6-12-6 Guarantee	6.00	12.00	6.00	37.20
54389	Analysis	6.18	12.67	6.02	38.52
54633	Analysis	6.28	12.61	6.59	39.37
54678	Analysis	6.25	12.75	6.50	39.38
	V-C Potato Special Guarantee	4.00	8.00	10.00	32.00
53564	Analysis	4.11	8.05	**9.74**	32.02
53892	Analysis	**3.94**	8.33	**9.19**	**31.32**
54005	Analysis	**3.86**	8.67	**9.58**	32.03
54422	Analysis	4.26	8.38	10.48	33.69
54492	Analysis	4.06	8.13	10.34	32.72
54652	Analysis	4.16	8.00	10.93	33.50
	V-C Prolific Cotton Grower Guarantee	3.00	10.00	3.00	23.80
53566	Analysis	3.19	10.23	3.43	25.08
54507	Analysis	3.19	10.04	3.19	24.54
	V-C Rice Grower Guarantee	.....	12.00	4.00	20.40
54542	Analysis	.....	12.54	4.15	21.28
	V-C Truckers Special Guarantee	4.00	8.00	6.00	27.20
53894	Analysis	4.15	8.16	6.02	27.79
54502	Analysis	4.20	8.33	6.41	28.60
	V-C 18% Superphosphate Guarantee	.....	18.00	.....	23.40
53561	Analysis	.....	18.25	.....	23.73
53822	Analysis	.....	18.61	.....	24.19
54541	Analysis	.....	18.82	.....	24.47
	V-C 20% Superphosphate Guarantee	.....	20.00	.....	26.00
53562	Analysis	.....	**19.23**	.....	**25.00**
54233	Analysis	.....	20.20	.....	26.26
	Charles F. Ward, San Antonio, Texas				
	Grasstonia Fertilizer Guarantee	4.00	12.00	4.00	30.00
54590	Analysis	7.84	14.85	4.59	43.64
	Vita-Glo Fertilizer with Ward's Root Rot Remedy Guarantee	4.00	10.00	4.00	27.40
54589	Analysis	6.10	12.44	**3.80**	35.37