

LIBRARY,
A & M COLLEGE,
CAMPUS.

E46-1032-7M-L180.

TEXAS AGRICULTURAL EXPERIMENT STATION

A. B. CONNER, DIRECTOR
COLLEGE STATION, BRAZOS COUNTY, TEXAS

BULLETIN NO. 460

OCTOBER, 1932

DIVISION OF CHEMISTRY

COMMERCIAL FERTILIZERS IN 1931-32 AND THEIR USES



AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS
T. O. WALTON, President

STATION STAFF†

Administration:

A. E. Conner, M. S., Director
 R. E. Karper, M. S., Vice-Director
 Clarice Mixson, B. A., Secretary
 M. P. Holleman, Chief Clerk
 J. K. Francklow, Asst. Chief Clerk
 Chester Higgs, Executive Assistant
 Howard Berry, B. S., Technical Asst.

Chemistry:

G. S. Fraps, Ph. D., Chief; State Chemist
 S. E. Asbury, M. S., Chemist
 J. F. Fudge, Ph. D., Chemist
 E. C. Carlyle, M. S., Asst. Chemist
 T. L. Ogier, B. S., Asst. Chemist
 A. J. Sterges, M. S., Asst. Chemist
 Ray Treichler, M. S., Asst. Chemist
 W. H. Walker, Asst. Chemist
 Velma Graham, Asst. Chemist
 Jeanne F. DeMottier, Asst. Chemist
 R. L. Schwartz, B. S., Asst. Chemist
 C. M. Pounders, B. S., Asst. Chemist

Horticulture:

S. H. Yarnell, Sc. D., Chief
 **L. R. Hawthorn, M. S., Horticulturist
 H. M. Reed, B. S., Horticulturist
 J. F. Wood, B. S., Horticulturist
 L. E. Brooks, B. S., Horticulturist

Range Animal Husbandry:

J. M. Jones, A. M., Chief
 B. L. Warwick, Ph. D., Breeding Investa.
 S. P. Davis, Wool Grader

Entomology:

F. L. Thomas, Ph. D., Chief; State Entomologist
 H. J. Reinhard, B. S., Entomologist
 R. K. Fletcher, Ph. D., Entomologist
 W. L. Owen, Jr., M. S., Entomologist
 J. N. Roney, M. S., Entomologist
 J. C. Gaines, Jr., M. S., Entomologist
 S. E. Jones, M. S., Entomologist
 F. F. Bibby, B. S., Entomologist
 S. W. Clark, B. S., Entomologist
 **E. W. Dunnam, Ph. D., Entomologist
 **R. W. Moreland, B. S., Asst. Entomologist
 C. E. Heard, B. S., Chief Inspector
 C. Siddall, B. S., Foulbrood Inspector
 S. E. McGregor, B. S., Foulbrood Inspector

Agronomy:

E. B. Reynolds, Ph. D., Chief
 R. E. Karper, M. S., Agronomist
 P. C. Mangelsdorf, Sc. D., Agronomist
 D. T. Killough, M. S., Agronomist
 H. E. Rea, B. S., Agronomist
 B. C. Langley, M. S., Agronomist

Publications:

A. D. Jackson, Chief

Veterinary Science:

*M. Francis, D. V. M., Chief
 H. Schmidt, D. V. M., Veterinarian
 I. B. Boughton, D. V. M., Veterinarian
 **F. P. Mathews, D. V. M., M. S., Veterinarian
 W. T. Hardy, D. V. M., Veterinarian
 R. A. Goodman, D. V. M., Veterinarian

Plant Pathology and Physiology:

J. J. Taubenhaus, Ph. D., Chief
 W. N. Ezekiel, Ph. D., Plant Pathologist
 W. J. Bach, M. S., Plant Pathologist
 C. H. Rogers, Ph. D., Plant Pathologist

Farm and Ranch Economics:

L. P. Gabbard, M. S., Chief
 W. E. Paulson, Ph. D., Marketing
 C. A. Bonnen, M. S., Farm Management
 **W. R. Nisbet, B. S., Ranch Management
 A. C. Magee, M. S., Farm Management

Rural Home Research:

Jesse Whitacre, Ph. D., Chief
 Mary Anna Grimes, M. S., Textiles
 Elizabeth D. Terrill, M. A., Nutrition

Soil Survey:

**W. T. Carter, B. S., Chief
 E. H. Templin, B. S., Soil Surveyor
 A. H. Bean, B. S., Soil Surveyor
 R. M. Marshall, B. S., Soil Surveyor

Botany:

V. L. Cory, M. S., Acting Chief
 S. E. Wolff, M. S., Botanist

Swine Husbandry:

Fred Hale, M. S., Chief

Dairy Husbandry:

O. C. Copeland, M. S., Dairy Husbandry

Poultry Husbandry:

R. M. Sherwood, M. S., Chief
 J. R. Couch, B. S., Asst. Poultry Husbandman

Agricultural Engineering:

H. P. Smith, M. S., Chief

Main Station Farm:

G. T. Mc Ness, Superintendent

Apiculture (San Antonio):

H. B. Parks, B. S., Chief
 A. H. Alex, B. S., Queen Breeder

Feed Control Service:

F. D. Fuller, M. S., Chief
 James Sullivan, Asst. Chief
 S. D. Pearce, Secretary
 J. H. Rodgers, Feed Inspector
 K. L. Kirkland, B. S., Feed Inspector
 S. D. Reynolds, Jr., Feed Inspector
 P. A. Moore, Feed Inspector
 E. J. Wilson, B. S., Feed Inspector
 H. G. Wickes, B. S., Feed Inspector

SUBSTATIONS

No. 1, Beeville County:

R. A. Hall, B. S., Superintendent

No. 2, Lindale, Smith County:

P. R. Johnson, M. S., Superintendent

**B. H. Hendrickson, B. S., Sci. in Soil Erosion

**R. W. Baird, B. S., Assoc. Agr. Engineer

No. 3, Angleton, Brazoria County:

R. H. Stansel, M. S., Superintendent

H. M. Reed, M. S., Horticulturist

No. 4, Beaumont, Jefferson County:

R. H. Wyche, B. S., Superintendent

**H. M. Beachell, B. S., Jr., Agronomist

No. 5, Temple, Bell County:

Henry Dunlavy, M. S., Superintendent

C. H. Rodgers, Ph. D., Plant Pathologist

H. E. Rea, B. S., Agronomist

S. E. Wolff, M. S., Botanist

**H. V. Geib, M. S., Sci. in Soil Erosion

**H. O. Hill, B. S., Jr., Civil Engineer

No. 6, Denton, Denton County:

F. B. Dunkle, B. S., Superintendent

**I. M. Atkins, B. S., Jr., Agronomist

No. 7, Spur, Dickens County:

R. E. Dickson, B. S., Superintendent

B. C. Langley, M. S., Agronomist

No. 8, Lubbock, Lubbock County:

D. L. Jones, Superintendent

Frank Gaines, Irrig. and Forest Nurs.

No. 9, Balmorhea, Reeves County:

J. J. Bayles, B. S., Superintendent

No. 10, College Station, Brazos County:

R. M. Sherwood, M. S., In Charge

L. J. McCall, Farm Superintendent

No. 11, Nacogdoches, Nacogdoches County:

H. F. Morris, M. S., Superintendent

**No. 12, Chillicothe, Hardeman County:

**J. R. Quinby, B. S., Superintendent

**J. C. Stephens, M. A., Asst. Agronomist

No. 14, Sonora, Sutton-Edwards Counties:

W. H. Dameron, Superintendent

I. B. Boughton, D. V. M., Veterinarian

W. T. Hardy, D. V. M., Veterinarian

O. L. Carpenter, Shepherd

**O. G. Babcock, B. S., Asst. Entomologist

No. 15, Weslaco, Hidalgo County:

W. H. Friend, B. S., Superintendent

S. W. Clark, B. S., Entomologist

W. J. Bach, M. S., Plant Pathologist

J. F. Wood, B. S., Horticulturist

No. 16, Iowa Park, Wichita County:

C. H. McDowell, B. S., Superintendent

L. E. Brooks, B. S., Horticulturist

No. 19, Winterhaven, Dimmit County:

E. Mortensen, B. S., Superintendent

**L. R. Hawthorn, M. S., Horticulturist

Teachers in the School of Agriculture Carrying Cooperative Projects on the Station:

G. W. Adriance, Ph. D., Horticulture
 S. W. Bilsing, Ph. D., Entomology
 V. P. Lee, Ph. D., Marketing and Finance
 D. Scoates, A. E., Agricultural Engineering
 A. K. Mackey, M. S., Animal Husbandry

J. S. Mogford, M. S., Agronomy
 F. R. Brison, B. S., Horticulture
 W. R. Horlacher, Ph. D., Genetics
 J. H. Knox, M. S., Animal Husbandry
 A. L. Darnell, M. A., Dairy Husbandry

*Dean School of Veterinary Medicine.

**In cooperation with U. S. Department of Agriculture.

†As of September 1, 1932.

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

The total sales of fertilizer in Texas for 1931-32 were 33,406 tons. In 1930-31 they were 64,424 tons. In 1929-30 they were 138,917 tons—all exclusive of cottonseed meal sold as a feed but used as a fertilizer. Sales of fertilizer decreased about 40 per cent, and the use of fertilizer on cotton apparently decreased much more than 40 per cent. Practically all the sales of mixed fertilizers were confined to about 20 analyses.

The Bulletin contains a discussion of the use of fertilizers and suggestions for their use on various crops and in various sections of the State.

Tables are given showing the extent to which the various fertilizer manufacturers met or exceeded their guarantees. The cost of fertilizer was less in 1931-32 than in 1930-31.

CONTENTS

	Page
Introduction	5
Explanation of terms	5
Information on fertilizer bag and tag	6
Meaning of the figures naming a fertilizer	6
National and international uniformity	6
How to calculate the valuation	6
Quantity sold	7
Quantity of sales by grades	7
Quantity of cottonseed meal used as a fertilizer	7
Composition and selling price of different grades of fertilizer	7
Cost of plant food	9
Relation of cost to concentration of fertilizers	11
Comparing costs of fertilizer	12
Fertilizer analyses to be sold in 1932-33	12
Free analysis	12
Analysis of fertilizers, 1931-32	13
Relation of valuation guarantee to valuation delivered	13
Averages below guarantee	14
Investigations under the fertilizer law	14
Relation to Experiment Station work	14
Colloidal mineral phosphate	14
Sulphur, gypsum, and manganese	14
Greensand	16
Polyhalite and sewage sludge	16
General considerations on the use of fertilizers	16
How and when to apply fertilizer	17
How much to apply	18
Side dressings	18
Fertilizers for East Texas	18
Fertilizers for the black lands	18
Fertilizers for West Texas	19
Fertilizers for the Rio Grande Valley	19
Fertilizers for the Gulf Coastal Plains	20
Fertilizers suggested for the various crops	20
Grades with the same ratios	20
Alfalfa	20
Asparagus	20
Beans (garden) and peas (garden or English)	21
Beets, carrots, and turnips	21
Broccoli, cabbage, cauliflower, mustard, and spinach	21
Corn	21
Cotton	22
Cantaloupes, cucumbers, squash, or watermelons	22
Eggplant, okra, peppers, and radishes	22
Figs	22
Grapefruit or orange trees	23
Onions	23
Peach or plum trees	23
Potatoes, sweet	24
Potatoes, Irish	24
Rice	24
Sorghum	24
Strawberries	24
Tomatoes	24
Home gardens	25
Shade trees and ornamental shrubs	25
Lawns	26
Summary	26

COMMERCIAL FERTILIZERS IN 1931-32 AND THEIR USES

G. S. FRAPS AND S. E. ASBURY

The object of the fertilizer law is to protect both farmer and manufacturer against misrepresentation of the composition of the fertilizer, and to ensure that the fertilizer is correctly labeled so that the purchaser can see what he is getting.

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 thirtieth Fertilizer Control Bulletin and contains statistics, suggestions as to the use of fertilizer, and a report on the analyses made in enforcing the provisions of the fertilizer law.

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.

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

Total phosphoric acid is the entire quantity of the phosphoric acid 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 is required 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.

Valuation per ton represents the approximate cost of the plant food in the unmixed fertilizer, at retail. It is not the price at which the fertilizer is sold. The selling price includes also cost of mixing, sacks, transportation, manufacturers' and dealers' profits. The valuations are decided on about September 1, and the prices often change before the active fertilizer season, which is February to April. The valuation sums the value of the three plant foods shown in the analysis into a single figure and is convenient for this purpose. A deficiency in one plant food may be compensated by an excess of another. The valuation found compared with the valuation guaranteed shows whether

or not the fertilizer as a whole is better or poorer than the guaranteed analysis. The following valuations were used in 1931-32.

	Cents per pound
Nitrogen	16.0
Available phosphoric acid	6.0
Total phosphoric acid in Thomas phosphate, tankage, and bone meal	4.0
Total phosphoric acid in rock phosphate	1.5
Potash	5.5

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. Total phosphoric acid may be guaranteed on 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

When a fertilizer is named by figures in this Bulletin, the first figure stands for the percentage of nitrogen, the second for the percentage of available phosphoric acid, the third for the percentage of water-soluble potash. For example, a 4-8-4 fertilizer contains 4 per cent nitrogen, 8 per cent available phosphoric acid, and 4 per cent potash.

National and International Uniformity

The movement for national and international uniformity in naming fertilizers, sponsored by the National Farm Papers and the National Fertilizer Conference and supported by the Association of Official Agricultural Chemists, the National Fertilizer Association and other organizations, has made decided progress, and there are now only three or four states out of line with the others.

The use of the term nitrogen, and not ammonia, is desired, together with this order of terms: nitrogen first, phosphoric acid second, and potash third.

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 16 cents a pound, the valuation of a unit is $16 \times 20 = \$3.20$. The valuation of a unit of available phosphoric acid at 6 cents a pound would be $6 \times 20 = \$1.20$; the valuation of a unit of potash

at 5.5 cents a pound would be \$1.10. The following is an example of the calculation at the prices given above:

Valuation of 4-8-4 fertilizer

Nitrogen	4 × \$3.20 = \$12.80
Available phosphoric acid	8 × \$1.20 = \$ 9.60
Potash	4 × \$1.10 = \$ 4.40
Total valuation per ton	\$26.80

QUANTITY SOLD

The quantities of commercial fertilizers sold in Texas for several seasons are given in Table 1. The sales in 1931-32 were about 60 per cent of those for last season. The largest sales made in Texas were during the season 1928-29. Fertilizer statistics for a number of years to August 31, 1926, have been published in Bulletin 350.

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

Season	Tons
1905-06	13,500
1910-11	52,985
1913-14	77,400
1914-15	17,500
1917-18	58,000
1918-19	46,000
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
1929-30	138,917
1930-31	64,424
1931-32	33,406

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 of 1931-32. For the first time, sales of 18 per cent superphosphate are highest of all. The 4-8-4 comes second, and is now more popular than 4-12-4, which comes fourth.

Quantity of Cottonseed Meal Used as a Fertilizer

The tonnage of cottonseed meal reported in Table 2 includes only that sold as a fertilizer and tagged with fertilizer tags. Considerable quantities of cottonseed meal sold as feed and tagged with feed tags, are used as fertilizer. No estimate of these sales has been made for 1932, but the amount sold as fertilizer was probably more than last season.

COMPOSITION AND SELLING PRICE OF DIFFERENT GRADES OF FERTILIZER

Table 3 contains the average composition, the guaranteed valuation, the valuation found by analysis, and the average retail selling price per ton of various grades of fertilizers. The average retail selling price

Table 2. Fertilizer sales by grades in order of tonnage for 1931-32.

	1931-32	1930-31	1929-30	1928-29
18% superphosphate	6,505	10,149	12,938	12,201
4-8-4	3,661	8,888	24,601	22,738
4-8-6	3,409	6,046	6,046	4,102
4-12-4	3,370	8,710	27,180	51,424
6-10-7	2,234	3,456	2,652	2,999
6-12-6	2,122	3,301	4,100	4,855
20% superphosphate	1,637	2,885	5,355	5,022
3-10-3	1,578	7,056	33,837	37,110
5-15-5	1,091	2,066	3,769	6,562
20% sulphate of ammonia	1,039	770	1,324	1,317
Nitrate of soda	726	1,299	3,732	4,257
Bone meal	696	428	609	117
Cottonseed meal	574	1,266	563	797
4-10-0	554	646	548	-----
9-18-18	392	727	311	-----
Activated sludge	362	-----	-----	-----
4-10-7	315	686	1,069	926
3-10-8	309	1,065	1,079	1,425
Miscellaneous mixed fertilizer	292	369	192	360
48% muriate of potash	284	222	363	579
16-20-0	261	232	42	-----
10-20-10	247	375	50	-----
0-12-4	196	-----	-----	246
11-48-0	155	-----	-----	-----
6-9-3	152	542	1,650	2,502
4-10-2	134	511	3,117	5,873
8-24-8	127	352	-----	-----
Cyanamid	121	176	91	50
3-10-1	118	-----	-----	-----
0-15-6	107	452	1,346	890
10-20-20	100	20	-----	-----
20% kainit	87	78	62	-----
14% kainit	67	-----	-----	-----
6-18-6	53	324	1,451	919
4-8-10	52	-----	-----	-----
Calcium nitrate	50	23	-----	-----
Miscellaneous unmixed fertilizer	44	92	132	-----
9-27-9	42	86	124	-----
12-24-12	40	3	10	-----
12% kainit	28	-----	-----	-----
10-0-10	24	10	43	-----
20-20-0	23	35	-----	-----
45% superphosphate	12	62	-----	-----
10-30-10	8	22	70	-----
48% sulphate of potash	7	4	53	26
15-30-15	1	8	42	9
5-10-10	-----	377	-----	-----
11-46-0	-----	230	-----	-----
14% and 12% kainit	-----	140	221	516
Colloidal mineral phosphate	-----	125	100	-----
Basic slag	-----	94	-----	-----
10-5-5	-----	16	-----	-----
0-20-6	-----	-----	45	-----
2-10-2	-----	-----	-----	12,236
16% superphosphate	-----	-----	-----	3,920
3-8-3	-----	-----	-----	2,705
3-9-0	-----	-----	-----	421
8-8-4	-----	-----	-----	111
Total	33,406	64,424	138,917	187,215

is the average of the cash retail prices as furnished to the fertilizer inspector by the dealers. The price of the same fertilizer is different in different places, on account of differences in freight rates or for other causes. The retail price includes handling costs, carrying charges, and the dealer's profits, as well as the items mentioned under valuation.

Table 3. Average composition, valuation, and selling price of grades of fertilizer, 1931-32.

Grade	Number averaged	Nitrogen per cent	Available phosphoric acid per cent	Potash per cent	Guaranteed valuation per ton	Valuation found per ton	Selling price per ton
0-15-6	3	-----	14.70	5.50	\$24.60	\$23.69	\$27.18
3-0-0	5	2.61	-----	-----	9.60	8.35	23.84
3-10-3	58	3.18	10.33	3.30	24.90	26.20	27.43
3-10-8	4	3.19	10.28	8.20	30.40	31.55	33.83
4-8-4	117	3.97	8.52	4.20	26.80	27.53	28.67
4-8-6	80	4.01	8.43	6.10	29.00	29.68	30.62
4-8-10	2	3.96	8.39	9.40	33.40	33.06	34.90
4-10-0	12	4.02	10.54	-----	24.80	25.51	26.38
4-10-2	8	4.69	9.97	2.67	27.00	29.90	28.65
4-10-7	6	4.43	10.37	6.64	32.50	33.93	34.40
4-12-4	101	4.13	12.09	4.22	31.60	32.37	33.83
5-2-2	4	5.02	2.95	2.20	20.60	22.01	27.56
5-15-5	18	5.11	14.79	5.34	39.50	39.96	35.06
6-9-3	5	5.87	9.36	3.26	33.30	33.62	30.80
6-10-7	42	5.97	10.37	7.06	38.90	39.30	37.60
6-12-6	46	5.85	12.26	6.06	40.20	40.09	38.45
8-24-8	5	8.07	23.70	8.05	63.20	63.13	56.76
9-18-18	3	8.90	17.70	17.34	70.20	68.81	67.82
9-27-9	2	9.06	26.97	8.68	71.10	70.88	68.08
10-20-10	3	9.69	19.91	9.60	67.00	65.44	65.05
11-48-0	3	11.20	48.25	-----	92.80	93.75	78.40
16-20-0	1	16.42	20.85	-----	75.20	77.56	60.50
Cottonseed meal fertilizer 6-1-1	1	6.48	2.38	1.49	24.32	25.24	17.00
Cyanamid, 22-0-0	1	22.11	-----	-----	70.40	70.75	41.44
Dried shrimp, waste and marl, low grade, 3-1-1	1	1.68	.91	.24	11.90	6.73	18.50
Activated sludge	2	5.57	2.87	-----	18.16	21.25	18.75
Muriate of potash	6	-----	-----	49.16	52.80	54.08	42.46
Nitrate of soda 16-0-0	6	16.05	-----	-----	51.20	51.36	53.86
Low grade 1-3-1	2	1.18	*2.95	1.59	6.70	7.86	27.00
Steamed bone meal	1	1.69	*30.07	-----	27.20	29.47	52.00
Sulphate of ammonia, 20% nitrogen	15	20.53	-----	-----	64.00	65.68	39.63
Sulphate of potash	1	-----	-----	48.09	52.80	52.90	67.50
Superphosphate, 18%	51	-----	18.58	-----	21.60	22.29	20.40
Superphosphate, 20%	27	-----	20.51	-----	24.00	24.61	23.25
Raw bone meal	1	4.34	*23.25	-----	29.44	32.49	26.00

*Total phosphoric acid.

The first column of Table 3 contains the guaranteed analyses. Average analyses which are below the guarantee are underscored. The valuation found exceeds the valuation guaranteed in almost every case. The exceptions are 0-15-6, 3-0-0, 4-8-10, 8-24-8, 9-18-18, 9-27-9, 10-20-10, and dried shrimp and marl. In most cases, the valuations found are only slightly below the guaranteed valuations.

COST OF PLANT FOOD

Table 4 contains the 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 of Table 3 and the guaranteed composition of a number of grades of fertilizer. For the purpose of this calculation 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 repre-

sent 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 charges. The fertilizers with the lowest prices are given first.

Table 4. Approximate average retail cost of plant food in cents per pound arranged in order of increasing cost.

	Nitrogen	Available phosphoric acid	Potash	Number averaged
Cyanamid, 22-0-0	9.44	-----	-----	1
Sulphate of ammonia, 20% nitrogen	9.92	-----	-----	15
Cottonseed meal fertilizer, 6-1-1	11.20	4.20	3.85	1
16-20-0	12.80	4.80	-----	1
Muriate of potash	-----	-----	4.40	6
11-48-0	13.44	5.04	-----	3
Raw bone meal	14.08	3.52*	-----	1
5-15-5	14.24	5.34	4.90	18
8-24-8	14.40	5.40	4.95	5
6-9-3	14.72	5.52	5.06	5
Superphosphate, 18%	-----	5.64	-----	51
6-12-6	15.36	5.76	5.28	46
9-27-9	15.36	5.76	5.28	2
6-10-7	15.52	5.82	5.34	42
9-18-18	15.52	5.82	5.34	3
10-20-10	15.52	5.82	5.34	3
Superphosphate, 20%	-----	5.82	-----	27
Activated sludge (Hu-Actinite)	16.48	6.18	-----	2
4-8-10	16.64	6.24	5.72	2
6-18-6	16.64	6.24	5.72	1
Nitrate of soda, 16-0-0	16.80	-----	-----	6
4-8-6	16.96	6.36	5.83	80
4-10-0	16.96	6.36	5.83	12
4-10-2	16.96	6.36	5.83	8
4-10-7	16.96	6.36	5.83	6
4-8-4	17.12	6.42	5.89	117
4-12-4	17.12	6.42	5.89	101
Calcium nitrate (nitrate of lime) 15-0-0	17.28	-----	-----	1
0-15-6	-----	6.60	6.05	3
3-10-3	17.60	6.60	6.05	58
3-10-8	17.76	6.66	6.11	4
Nitrate of soda, 15-0-0	18.88	-----	-----	1
Sulphate of potash	-----	-----	7.04	1
5-2-2	21.44	8.04	7.37	4
Dried shrimp, waste and marl,	-----	-----	-----	-----
low grade, 3-1-1	24.80	9.30	8.53	1
3-0-0, low grade	39.68	-----	-----	5
1-3-1, low grade	64.48	16.12*	22.17	2

*Total phosphoric acid.

Cost of nitrogen. Cyanamid was the cheapest source of nitrogen; sulphate of ammonia was next, and cottonseed meal came third. Low-grade 1-3-1 was the most expensive source of nitrogen, low-grade 3-0-0 came next, followed by steamed bone meal, low-grade dried-shrimp waste and marl, and 5-2-2. Nitrogen in nitrate of soda (16%) cost about 70% more than in sulphate of ammonia. Nitrogen cost more in the mixed fertilizers than in sulphate of ammonia or cyanamid, as the cost of mixing entered into the cost. Nitrogen in a number of the mixed fertilizers cost less than in nitrate of soda. The lowest-priced nitrogen in the mixed fertilizer was in the 16-20-0, followed by the 11-48-0, 5-15-5, 8-24-8, and then 6-9-3. Nitrogen was lower in price than last season, the difference averaging 3.34 cents a pound for nitrogen in

sulphate of ammonia, 0.92 cents for 16% nitrate of soda, 4.52 cents for 3-10-3, and 4.53 cents for 4-12-4.

Cost of phosphoric acid. The cheapest source of phosphoric acid was in 16-20-0, and 11-48-0, followed by 5-15-5. Available phosphoric acid cost about .18 cents less per pound in 18 per cent superphosphate than in 20 per cent. Phosphoric acid was most expensive in 1-3-1 low-grade, then in low-grade 3-0-0, followed by low-grade dried-shrimp waste and marl, and then 5-2-2.

Cost of potash. Muriate of potash was the cheapest form of potash, and 1-3-1 low-grade fertilizer the most expensive. Potash cost less than during the previous season. The difference was 0.86 cents a pound for potash in muriate of potash, 0.59 cents for 3-10-3, and 0.60 cents for 4-12-4.

High-priced fertilizers. Certain fertilizers sold for prices excessively high compared with others, as may be seen by reference to Table 4. Evidently the purchaser was not informed with respect to the value of the fertilizer he was buying. Three of these fertilizers were low-grade. Only small amounts were sold.

Relation of Cost to Concentration of Fertilizers

The ratios of plant food in the 3-10-3, 4-12-4, 5-15-5, and 6-18-6 fertilizers are nearly the same, as the proportions are about three parts phosphoric acid to one of nitrogen and one of potash. Table 5 shows the approximate cost of nearly equal quantities of plant food in these fertilizers at the average prices given in Table 3. The plant food in a ton of 4-12-4 costs \$1.33 more than an equal quantity in 5-15-5. The two tons of 3-10-3 costs \$4.12 more than the one and one-half tons of 4-12-4, but as it contains 40 pounds more phosphoric acid, with a valuation of \$2.30, the plant food in 3-10-3 costs about 1.72 more. That is, 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-priced per pound of plant food. This difference is caused partly by freight charges, partly by the cost of bagging, etc. However, phosphoric acid averaged cheaper in 18 per cent superphosphate this season than in 20 per cent.

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

Grade	Available phosphoric acid	Nitrogen	Potash	Cost
Group 1	Pounds	Pounds	Pounds	
1.2 tons—5-15-5	360	120	120	\$42.07
1.5 tons—4-12-4	360	120	120	50.74
2 tons—3-10-3	400	120	120	54.86
Group 2				
1 ton—6-12-6	240	120	120	38.45
1-1/2 tons—4-8-4	240	120	120	40.30

Comparing Costs 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 1931-32 are given in Table 3, and while the valuations for 1932-33 will be different, these valuations may be used for comparative purposes. For example, if a 4-8-4 sells for \$30.00 a ton and a 6-12-6 for \$39.00, which is cheaper? Using the valuations from Table 3, we have, for 4-8-4, \$30.00 divided by \$28.60=1.05; for 6-12-6, \$39.00 divided by \$40.20=0.97. One dollar of valuation costs \$1.05 in 4-8-4, and 0.97 in 6-12-6; therefore the 6-12-6 is cheaper. The valuations of grades not given in Table 3 may be calculated by the method already given in this Bulletin; such grades, especially, are liable to be sold at excessive prices.

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

FERTILIZER ANALYSES TO BE SOLD IN 1932-33

The grades of fertilizer sold in Texas are limited in number. This standardization aids the farmer in becoming 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 farmer.

Few changes have been made in the analyses to be placed on the market next season. The 5-10-10 was dropped and 10-20-0 was added.

The analyses of mixed fertilizer which will be sold in 1932-33, stated in the order of nitrogen first, phosphoric acid second, and potash third, is as follows:

0-15-6	6-10-7	12-24-12	Muriate of potash 48%
3-10-3	6-12-6	15-30-15	Sulphate of potash 48%
3-10-8	6-18-6	16-16-16	Cottonseed meal
4-8-4	8-24-8	16-20-0	Calcium nitrate
4-8-6	9-18-18	20-20-0	Bone meal
4-8-10	9-27-9	20-49-0	Basic slag 18% total
4-10-0	10-0-10	Superphosphate 18%, 20%, 45%	Tankage
4-10-2	10-20-0	Kainit 14%	Sheep manure
4-10-7	10-20-10	Kainit 20%	Cyanamid
4-12-4	10-20-20	Sulphate of ammonia 20%	
5-15-5	10-30-10	Nitrate of soda 15%, 16%	
6-9-3	11-48-0	Dicalcium phosphate 24%, 30%, 36%	

It will be noticed that the ratio of both nitrogen and potash to phosphoric acid is 1 to 3, or nearly so, in 3-10-3, 4-12-4, 5-15-5, 6-18-6, 8-24-8, 9-27-9 and 10-30-10; that it is 1 to 2 in 4-8-4, 6-12-6, 10-20-10, 12-24-12, and 15-30-15; and that the ratio is 1:2:2 in 5-10-10 and 9-18-18.

FREE ANALYSIS

Purchasers of commercial fertilizers for their own use (but not for sale), can secure a free analysis of a 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 any sample. The proper sampling of a fertilizer requires care. If the sample is not properly taken, it does not represent the lot of fertilizer, 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.

ANALYSIS OF FERTILIZERS, 1931-32

Table 8, near the end of this Bulletin, contains a list of the samples of fertilizer subjected to analysis in the season beginning September 1, 1930. 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, R. L. Schwartz, C. M. Pounders, and Gideon W. Smith.

Table 6. Average valuation of all fertilizers, guaranteed and found in dollars a ton.

	Number averaged	No. of samples more than 4 per cent below guarantee	Valuation	
			Guaranteed	Found
American Cyanamid Company	5	0	\$84.80	\$85.91
American Fertilizer Works	9	3	14.49	14.42
Arkansas Fertilizer Company	1	0	29.00	29.41
Armour Fertilizer Works	75	2	34.31	34.80
Geo. L. Barber & Son	2	0	42.80	44.41
The Barrett Company	6	0	53.63	54.21
Bryan Cotton Oil & Fertilizer Company	4	0	27.95	29.02
City of Houston	2	0	18.16	21.25
Davison-Pick Fertilizers, Incorporated	18	0	31.44	31.63
East Texas Cotton Oil Company	16	0	31.68	32.95
Farmers Cotton Oil Company	5	0	29.08	30.56
Fidelity Chemical Corporation	40	3	32.50	33.05
Ford Motor Company	2	0	66.56	66.93
Gilmer Cotton Oil & Fertilizer Company	5	0	27.74	29.58
Gulf States Chemical Company	1	0	64.00	67.04
International Agricultural Corporation	20	0	28.92	29.06
Kelly, Weber & Co., Inc.	6	0	26.80	27.43
Lang Fertilizer Company	1	1	11.90	6.73
La-Tex Fertilizer Works	1	0	29.00	30.19
Longview Cotton Oil Company	15	0	31.69	32.72
Marshall Cotton Oil Company	18	1	30.02	30.79
Meridian Fertilizer Factory	43	0	30.85	32.25
Mixson Brothers	7	0	27.67	29.91
Oil Mill & Fertilizer Works	17	0	29.42	30.23
Palestine Oil Mill & Fertilizer Company	30	7	28.29	28.17
Pate Brothers Fertilizer Works	15	0	30.98	32.54
Pelican Fertilizer Works	3	0	27.77	28.28
Pittsburg Cotton Oil Company	5	0	25.16	26.19
Quadruple Feed & Fertilizer Company	2	0	6.70	7.86
Shreveport Fertilizer Works	35	2	28.70	29.43
Smith County Cotton Oil & Fertilizer Co.	16	0	30.77	32.12
South Texas Cotton Oil Company	1	0	26.80	27.78
Swift & Company Fertilizer Works	117	2	33.85	34.48
Synthetic Nitrogen Products Corporation	1	0	48.00	46.69
Texas Chemical Company	1	0	29.44	32.49
Texas Farm Products Company	50	3	30.90	31.03
Texas Farmers Cooperative Association	1	0	21.60	22.39
Thomas Self	5	0	28.58	31.18
Tyler Fertilizer Company	17	2	32.42	32.39
Virginia-Carolina Chemical Corporation	35	1	30.06	31.10

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.

Table 7 contains the average guaranteed analyses, and the average analyses found for mixed fertilizers sold by the various manufacturers. The averages in these tables do not include superphosphate, nitrate of soda, and other fertilizer materials, but only the 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. The 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.

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.

Colloidal Mineral Phosphate

Colloidal mineral phosphate 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 colloidal mineral phosphate is much lower than that of the available phosphoric acid in 20 per cent superphosphate.

Sulphur, Gypsum, and Manganese

We are unable to recommend the use of sulphur or gypsum as a fertilizer in Texas or for application to Texas soils. The experiments which have been carried out do not give results which justify the use of such materials on soils (see Bulletins 408 and 414).

Table 7. Average composition of mixed fertilizer, guaranteed and found.

	Number averaged	Nitrogen per cent		Phosphoric acid per cent		Potash per cent		Valuation per ton	
		Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Cyanamid Company	4	12.25	12.51	41.00	41.40	-----	-----	\$88.40	\$89.71
American Fertilizer Works	9	3.89	3.68	.89	1.31	.89	.98	14.49	14.42
Arkansas Fertilizer Company	1	4.00	3.70	8.00	8.81	6.00	6.35	29.00	29.41
Armour Fertilizer Works	63	4.83	4.87	11.52	11.62	5.68	5.78	35.52	35.87
Bryan Cotton Oil & Fertilizer Company	3	4.00	3.91	10.67	11.12	3.33	4.40	29.27	30.68
Davison-Pick Fertilizers, Incorporated	16	4.69	4.57	10.25	10.70	4.75	4.77	32.53	32.73
East Texas Cotton Oil Company	10	4.10	4.30	10.40	10.93	3.60	3.93	29.56	31.20
Farmers Cotton Oil Company	5	4.00	4.22	8.80	9.16	5.20	5.52	29.08	30.56
Fidelity Chemical Corporation	33	4.58	4.64	11.03	11.38	4.94	4.98	33.31	33.97
Gilmer Cotton Oil & Fertilizer Company	5	3.80	3.74	8.40	9.95	5.00	5.16	27.74	29.58
International Agricultural Corporation	17	4.12	4.13	8.94	8.95	5.47	5.50	29.92	29.99
Kelly, Weber & Company, Incorporated	2	2.00	1.98	12.00	11.73	4.00	4.14	25.20	24.94
La-Tex Fertilizer Works	1	4.00	4.11	8.00	8.13	6.00	6.62	29.00	30.19
Longview Cotton Oil Company	13	4.08	4.24	10.31	10.23	4.15	4.58	29.98	30.89
Marshall Cotton Oil Company	17	3.88	3.93	9.06	9.37	4.29	4.41	28.02	28.67
Meridian Fertilizer Factory	39	3.92	4.11	9.56	9.93	4.36	4.57	28.83	30.10
Mixson Brothers	6	3.67	4.05	10.00	10.75	4.50	4.84	28.68	31.18
Oil Mill & Fertilizer Works	16	4.31	4.30	9.19	9.55	4.63	4.99	29.91	30.72
Palestine Oil Mill & Fertilizer Company	27	3.81	3.66	10.04	10.22	4.26	4.32	28.94	28.73
Pate Brothers Fertilizer Works	13	3.92	3.99	9.38	10.26	4.69	4.97	28.98	30.55
Pelican Fertilizer Works	3	3.67	3.67	10.00	10.29	3.67	3.81	27.77	28.88
Pittsburg Cotton Oil Company	3	4.00	3.82	8.00	8.78	4.67	5.42	27.53	28.71
Quadruple Feed & Fertilizer Company	2	1.00	1.18	3.00*	2.95*	1.00	1.59	6.70	7.86
Shreveport Fertilizer Works	28	3.93	4.02	9.21	9.50	4.25	4.53	28.30	29.23
Smith County Cotton Oil & Fertilizer Co.	11	4.18	4.22	8.64	9.67	4.09	4.28	28.25	29.83
South Texas Cotton Oil Company	1	4.00	4.18	8.00	8.22	4.00	4.13	26.80	27.78
Swift & Company Fertilizer Works	99	4.74	4.81	11.37	11.58	5.07	5.23	34.39	35.04
Texas Farm Products Company	40	4.73	4.62	10.25	10.53	4.90	4.88	32.81	32.80
Thomas Self	3	4.67	5.07	10.00	10.98	5.00	5.67	32.43	35.62
Tyler Fertilizer Company	16	4.94	4.83	10.06	10.17	4.75	4.88	33.10	33.04
Virginia-Carolina Chemical Corporation	27	3.96	4.06	10.11	10.55	4.41	4.54	29.66	30.65

*Total phosphoric acid.

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 fertilizing value and could be used in quantities of 5 to 40 tons to an acre where it can be mixed 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 (see 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 (see 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, other conditions should be favorable, such as soil in good physical condition, well prepared seed bed, good seed, good cultivation, 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, but the cost of nitrogen is decreasing. 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. Such a system also adds organic matter to the soil, utilizes time and labor to better advantage, aids in destroying 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 it has grown legumes that have been turned under or grazed off, what the soil will produce without fertilizer, and other conditions.

Old soils, or sandy soils generally, are 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. 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 400 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 of nitrogen in the 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.

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 should be one to three inches below it or in the earth at the side. 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 also be placed in the ground not more than three weeks before planting. If applied too early, there is danger of loss of plant food by fixation or leaching.

Applications of more than 800 pounds of fertilizer to the acre are best made partly in the drill and partly broadcast. However, with some vegetables it is best to apply all the fertilizer in the drill.

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 with the soil, and not to apply them close to the seed or the roots of growing plants. These fertilizers are quite strong, and burning or other injury may result if they are concentrated close to roots of plants.

How Much to Apply

Farmers not experienced in the use of fertilizer should begin with moderate amounts, 200 to 400 pounds to the acre for cotton or corn and 400 to 800 pounds for truck crops. Larger amounts may 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.

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 deep sandy, where the plant food is likely to leach out.

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 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. The reason for this procedure is that there is little danger of loss of phosphoric acid or potash by leaching, while soluble nitrogen is much more easily 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.

Fertilizers for the Black Lands

The heavy black limestone soils of Central Texas, especially the Houston clay and the Houston black clay, do not respond well to fertilizers. 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. 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 it is probable that the roots of the plants penetrate deeper and have more soil to feed upon, 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.

Our suggestion at present for these soils would be then to begin with superphosphate, if the vegetative growth is very heavy. Follow with 10-20-0, 16-20-0, or 11-48-0, or begin with one of these if vegetative growth is not excessive. In the course of time, when potash has been depleted by cropping, one would reach such truck 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. They should have 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 as for the corresponding soils of East Texas. 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.

FERTILIZERS SUGGESTED FOR THE VARIOUS CROPS

The recommendations given below represent the best present information, and will be modified from time to time, as more experimental data are accumulated and further practical experience is secured.

Grades With the Same Ratios

Where a fertilizer of a given ratio is suggested, a different grade with the same ratio may, of course, 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, 5-15-5, 6-18-6, 8-24-8, 9-27-9, or 10-30-10 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, 10-20-10, 12-24-12, or 15-30-15 may be used, as they have the same ratio of plant food, 1-2-1.

Alfalfa

Soil recently put in alfalfa: Use 200 to 400 pounds of superphosphate.

Soil in cultivation six years or longer (best to rotate): Use 200 to 400 pounds of superphosphate, or 200 to 600 pounds of 0-15-6.

Soils poor in lime should receive lime; see Bulletin 243.

Asparagus

Apply 10 to 12 tons of well-rotted manure and 500 to 800 pounds to the 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 available, 600 to 900 pounds of the fertilizer could be used. Every spring apply 400 to 600 pounds of 6-12-6. Just before the cutting season is over, or soon after, apply 200 to 400 pounds of 4-8-4. Two top dressings of nitrate of soda, 100 pounds to the 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 of a 4-12-4 or 6-12-6 fertilizer is suggested, except in the Lower Rio Grande Valley, where the use of 200 to 300 pounds of 11-48-0 or 300 to 400 pounds of 10-20-0 is suggested.

Beets, Carrots, and Turnips

From 300 to 700 pounds per acre of 6-12-6 or 5-15-5 are suggested.

Broccoli, Cabbage, Cauliflower, Mustard, and Spinach

From 300 to 700 pounds 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, 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.

Corn

Loam or clay soils with clay or sandy clay subsoils, such as Susquehanna, Orangeburg, or similar soils with legume rotation: Use 200 to 300 pounds of 4-8-4, 6-9-3, or 4-10-0.

Loam or clay soils with clay or sandy clay subsoils, without legume rotation, in cultivation eleven years or more: Use 200 to 300 pounds of 4-8-4, 6-9-3, or 4-10-0.

Deep sandy soil: Use 200 to 300 pounds of 4-12-4. This is not a good corn soil.

Land which produces a heavy stalk, but does not fruit well: Use 200 pounds of 18 per cent or 20 per cent superphosphate.

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 of 4-10-0 or 100 pounds of 16-20-0.

Side dressing: Corn may frequently use to advantage a side dressing of nitrate of soda, sulphate of ammonia, or other soluble nitrate, applied when the corn is knee high, especially when unfertilized corn follows crops previously fertilized.

Land fertilized the previous season: Where corn follows cotton that has been well fertilized, 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 15 to 20 pounds of nitrogen as 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.

Cotton

Loam soils with clay or sandy clay subsoils, such as Ruston, Kirvin, Susquehanna, Lufkin, or similar soils. Experiments of the Division of Agronomy indicate that these soils respond to applications of nitrogen, phosphoric acid, and, to some extent, of potash. If 200 to 400 pounds is used, use 4-8-4, 6-9-3, or 4-12-4; if over 400 pounds is to be used, use 4-12-4, 4-8-4, or 6-9-3, or other fertilizers with a similar ratio of plant food.

Deep sandy soil, such as Norfolk sand. If 200 to 300 pounds or more is to be used, use 4-12-4; if 300 to 400 pounds or more is to be used, use 4-8-4 or other fertilizer with a similar ratio of plant food. However, these are not good cotton or corn soils and are better adapted to vegetables.

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

Dark prairie soils in the Gulf Coast Prairie, especially the Lake Charles soils, are deficient first in phosphoric acid, as shown by results of trials with fertilizers at the Experiment Station at Angleton: Use 100 pounds of 18 or 20 per cent superphosphate or 200 to 600 pounds per acre of a 4-10-0 fertilizer.

Black waxy land, such as Houston black clay or heavy limestone soils of Central Texas. A systematic rotation is needed first. These soils sometimes respond to applications of nitrogen and phosphoric acid, although fertilizers are uncertain. A trial may be made of 200 to 300 pounds of 4-10-0 or 6-9-3.

Cantaloupes, Cucumbers, Squash, or Watermelons

On sandy loam soils: If 200 to 300 pounds is applied, use 4-12-4 or 6-12-6. Larger applications are to be recommended, such as 300 to 500 pounds of 4-8-4 or 4-8-6. 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, Peppers, and Radishes

An application of 300 to 700 pounds of 6-12-6 or 4-8-6 is suggested for trial.

Figs

Recommendations for fertilizers for figs depend upon the nature of the soil and the size of the trees. On the heavy black prairie soil 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 1000 pounds to the acre, or a 10-20-0 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.

Grapefruit or Orange Trees

According to Bulletin 145 of the California Experiment Station nitrogen is the chief plant food needed in California, and is best supplied in well-rotted manure; excess of nitrogen may cause "mottle leaf."

For bearing trees, three applications are suggested. The first should be made early in the spring, the second in summer, the third in September. A 16-20-0, 10-20-0, or 11-48-0 fertilizer may be used on the Lower Valley soils, which are high in potash. On soils low in potash, a 10-20-10 may be desirable. Bearing trees ten years old may receive 15 to 30 pounds of fertilizer each year. More fertilizer is used as the trees become larger, larger trees receiving 30 to 50 pounds each.

Over-fertilized trees become affected with "die-back," especially if an excess of nitrogen is applied. Die-back is also caused by hard-pan, alkali, or poor drainage. "Mottle leaf" or "freshing" affects poorly nourished trees. It is believed an excess of nitrogen may reduce the shipping quality of the fruit or cause thick skins on grapefruit.

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.

Onions

The use of 600 to 800 pounds of 6-12-6, 6-9-3, or 6-10-7 is suggested, supplemented with one to three dressings of 100 pounds of sulphate of ammonia at intervals of ten to fifteen days after the plants have begun to make rapid growth in the spring. Under irrigation, the 6-12-6 fertilizer may be used at rates varying from 600 to 1800 pounds per acre.

Peach or Plum Trees

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 4-10-2. They 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 10-20-0, increasing the quantity as the trees grow older. According to experiments made in other states, nitrogen is the only element needed for complete crops of peaches.

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 of 4-12-4 or 6-12-6 may be used. **Deep sandy soil:** Use 200 to 500 pounds of 6-12-6 or 4-8-6. Excess of nitrogen will produce excessive growth of vine and deficiency of tubers. The use of manure is desirable in growing sweet potatoes.

Potatoes, Irish

On loam or sandy soils, 300 to 700 pounds 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 6-9-3 may be used. In the Rio Grande Valley, 10-20-0 or 11-48-0 gives good results.

Rice

Experiments conducted at 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). The sulphate of ammonia should be applied at the time of planting, or not later than six weeks after planting the rice. Superphosphate, and phosphate and potash gave profitable returns also, though not so great as the sulphate of ammonia.

Sorghum

An application of 200 to 300 pounds of 4-8-4, 6-9-3, or 4-10-0 is suggested.

Strawberries

An application of 300 to 600 pounds of 4-8-4, 6-12-6, or 4-12-4 may be made at the 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. One hundred pounds of sulphate of ammonia, applied as a side dressing one month before harvest, has been found effective in the Winter Garden.

Tomatoes

Loam soils with clay or sandy clay subsoils, such as the Ruston, Kirvin, or

Nacogdoches: If 400 to 600 pounds is used, use 4-8-6 or 6-12-6; if 500 to 1000 pounds, use 4-8-6, 4-8-4, 4-12-4, or 6-9-3. 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. In the Lower Rio Grande Valley, 200 to 400 pounds of 10-20-0 or 16-20-0 may give good results.

Deep sandy soil, such as Norfolk sand: If 200 to 500 pounds is used, use 4-8-6 or 4-8-4; if 500 to 1000 pounds is used, use 4-8-6. 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 has been found to give good results.

Land which produces an excessive vine: Use 200 to 400 pounds of superphosphate, 18 per cent or 20 per cent. On such soils it is also important to prune the vines, and on good land, good tomatoes can often be secured without fertilizer. Suckers should be removed every week beginning a week after the plants are set out and continuing until a week after the top is pinched off. The top is pinched off as soon as the third cluster is formed. Another method of pruning is to allow the first sucker to come out to form a fork and prune off all others. The top of the main stalk is pinched off immediately after the third cluster of fruit is formed, and the sucker is pinched off immediately after the second cluster is formed on it. According to New Hampshire Bulletin 28, excess of potash delays maturity of tomatoes, and phosphoric acid hastens maturity.

Home Gardens

Home gardens frequently receive large quantities of manure, with little or no applications of phosphoric acid or potash. This results in an unbalanced condition of the plant food in the soil, resulting in excessive growth of leaves and stems and insufficient fruit. The best fertilizer to apply when heavy applications of manure have been made would be 200 to 400 pounds of superphosphate, or 0-15-6 fertilizer.

Where applications of manure have been made only in moderate amounts, 300 to 600 pounds of 4-12-4 or 6-12-6 would probably be satisfactory. If lighter applications of manure are made, or none at all, 400 to 800 pounds of 4-8-4, 6-12-6, or 4-8-6 would be suggested, and top dressings with nitrate of soda or sulphate of ammonia might also be tried. The fertilizer should be mixed well with the dirt in the rows and not allowed to be in direct contact with either seed or plants.

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 best to put it down in holes 12 to 18 inches deep or deeper, punched with a pointed iron 1 to 2 inches in diameter. The fertilizer should be distributed in 15 or 24 holes around the trees, in a circle a little larger than the spread of the branches. For large trees, more holes should be punched. 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 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 black-land prairie region, and west or south of it. East of the black lands, especially on the sandy soils, a complete mixed fertilizer would probably be best, though a nitrogenous fertilizer might be sufficient.

Lawns

An application of either sulphate of ammonia, cottonseed meal, 4-12-4 or 4-8-4 fertilizer at the rate of one to 1½ pounds per hundred square feet, is suggested. The fertilizer should be applied evenly in the spring, 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 best applied by a special distributor, which runs as easily as a lawn mower. 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 10 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 1931-32 and information regarding the use of fertilizer.

An explanation of terms is given.

Sales of fertilizer in Texas were 33,406 tons in 1931-32. They were 64,424 tons in 1930-31, 138,917 tons in 1929-30, and 187,215 tons in 1928-29. This does 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 less in 20 per cent superphosphate than in 18 per cent, though the difference is small. Kainit is a very expensive source of potash, muriate of potash being much cheaper.

Nitrogen costs much less in sulphate of ammonia or cottonseed meal than in nitrate of soda. Plant food costs less per pound in the more

concentrated fertilizers than in less concentrated fertilizer, though the former costs more per ton. A pound of plant food costs most in the 1-3-1 low-grade fertilizer; the 3-0-0 low-grade comes next. Nitrogen is much lower in price than it was last season.

The low-grade fertilizers were high in cost of plant food and low in value delivered per dollar of cost.

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

Information is given regarding fertilizers, and suggestions are made for the fertilization of various crops in Texas.

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

Table 8. Analysis of commercial fertilizer, season 1931-32.

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, 535 Fifth Avenue, New York, N. Y.—					
	Aero Cyanamid—Guarantee	22.00	—	—	\$70.40
46930	Analysis	22.11	—	—	70.75
	Ammo-Phos 11-48-0—Guarantee	11.00	48.00	—	92.80
46928	Analysis	11.40	47.17	—	93.08
46935	Analysis	11.07	50.05	—	95.48
46937	Analysis	11.14	47.54	—	92.70
	Ammo-Phos 16-20-0—Guarantee	16.00	20.00	—	75.20
46929	Analysis	16.42	20.85	—	77.56
American Fertilizer Works, 401 North Comal Street, San Antonio, Texas—					
	Blue Bonnet High Grade 5-2-2—Guarantee	5.00	2.00	2.00	20.60
47222	Analysis	5.03	2.60	2.01	21.43
47375	Analysis	5.29	3.38	3.23	24.54
47376	Analysis	5.00	2.38	1.04	20.00
47486	Analysis	4.74	3.44	2.52	22.07
	Blue Bonnet Low Grade Lime-phos 3-0-0—Guarantee	3.00	—	—	9.60
46905	Analysis	1.94	—	—	6.21
46910	Analysis	3.16	—	—	10.11
46911	Analysis	2.16	—	—	6.91
46916	Analysis	2.49	—	—	7.97
46917	Analysis	3.29	—	—	10.53
Arkansas Fertilizer Company, Little Rock, Arkansas—					
	White Diamond Jack Rabbit—Guarantee	4.00	8.00	6.00	29.00
47295	Analysis	3.70	8.81	6.35	29.41
Armour Fertilizer Works, Houston, Fort Worth, Texas, and New Orleans, Louisiana—					
	Armour's Big Crop Fertilizer No. 0156—Guarantee	—	15.00	6.00	24.60
46941	Analysis	—	14.31	5.64	23.37
	Armour's Big Crop Fertilizer No. 3103—Guarantee	3.00	10.00	3.00	24.90
46988	Analysis	3.02	10.51	3.24	25.83
46999	Analysis	3.04	9.89	3.15	25.07
47053	Analysis	3.18	10.51	3.45	26.59
47409	Analysis	2.97	10.33	3.23	25.45
	Armour's Big Crop Fertilizer No. 484—Guarantee	4.00	8.00	4.00	26.80
47008	Analysis	3.81	8.07	4.24	26.53
47093	Analysis	3.73	8.56	4.15	26.78
47119	Analysis	3.85	7.77	4.48	26.57
47131	Analysis	4.01	8.15	4.04	27.05
47308	Analysis	3.92	8.15	4.06	26.79
47400	Analysis	4.03	7.85	4.15	26.89
47431	Analysis	3.97	8.24	4.10	27.10
	Armour's Big Crop Fertilizer No. 486—Guarantee	4.00	8.00	6.00	29.00
47000	Analysis	4.06	7.96	6.06	29.21
47046	Analysis	4.02	8.05	6.03	29.15
47074	Analysis	3.90	8.42	6.01	29.19
47120	Analysis	3.95	8.06	6.35	29.30
47130	Analysis	4.18	8.48	5.92	30.07
47286	Analysis	4.01	8.01	5.93	28.96
47309	Analysis	3.94	7.91	6.26	28.99
47351	Analysis	4.02	8.05	5.79	28.89
	Armour's Big Crop Fertilizer No. 4100—Guarantee	4.00	10.00	—	24.80
46919	Analysis	4.15	9.79	—	25.03
	Armour's Big Crop Fertilizer No. 4102—Guarantee	4.00	10.00	2.00	27.00
47092	Analysis	4.10	10.18	2.02	27.56
	Armour's Big Crop Fertilizer No. 4107—Guarantee	4.00	10.00	7.00	32.50
46974	Analysis	4.22	10.42	6.86	33.55
	Armour's Big Crop Fertilizer No. 4124—Guarantee	4.00	12.00	4.00	31.60
46960	Analysis	4.00	11.92	4.10	31.61
47006	Analysis	4.10	11.80	4.58	32.32
47047	Analysis	4.01	11.82	4.02	31.43
47052	Analysis	4.10	12.03	4.14	32.11

Table 8. Analysis of commercial fertilizer, season 1931-32—(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, Louisiana—Continued.					
Armour's Big Crop Fertilizer No. 4124—Guarantee—Continued.					
47073	Analysis	4.04	12.01	4.17	31.93
47251	Analysis	4.06	12.23	4.00	32.07
47352	Analysis	4.27	12.23	4.04	32.78
47391	Analysis	3.94	12.80	4.02	32.39
47399	Analysis	4.05	12.13	4.24	32.18
47419	Analysis	4.20	12.07	4.11	32.44
47471	Analysis	4.15	12.37	3.79	32.29
47481	Analysis	4.02	12.42	4.02	32.18
Armour's Big Crop Fertilizer No. 5155—Guarantee					
46884	Analysis	5.00	15.00	5.00	39.50
46958	Analysis	5.07	14.73	6.02	40.52
46961	Analysis	5.21	14.84	5.07	40.06
46963	Analysis	5.16	14.98	5.18	40.19
46972	Analysis	5.08	15.11	5.13	40.03
46998	Analysis	5.12	14.73	5.13	39.70
47259	Analysis	5.21	14.95	5.27	40.41
47406	Analysis	5.19	14.64	5.30	40.01
Armour's Big Crop Fertilizer No. 6107—Guarantee					
46881	Analysis	5.36	15.53	5.47	41.81
46904	Analysis	6.00	10.00	7.00	38.90
46906	Analysis	6.31	10.14	7.16	39.93
46957	Analysis	5.73	10.36	6.77	38.22
46959	Analysis	5.88	10.47	6.84	38.90
46962	Analysis	5.96	10.34	7.10	39.29
47051	Analysis	5.97	10.31	6.94	39.10
47226	Analysis	6.00	10.49	7.01	39.50
Armour's Big Crop Fertilizer No. 6126—Guarantee					
46882	Analysis	6.04	10.05	7.29	39.41
46973	Analysis	6.02	9.75	7.01	38.67
47010	Analysis	6.00	12.00	6.00	40.20
47158	Analysis	6.04	12.59	6.35	41.43
47208	Analysis	6.10	12.08	6.39	41.05
47225	Analysis	6.15	12.13	6.24	41.10
47484	Analysis	6.03	12.10	6.17	40.61
47504	Analysis	6.07	12.01	6.06	40.50
Armour's Big Crop Nitrate of Soda—Guarantee					
46975	Analysis	6.04	12.03	6.23	40.62
Armour's Big Crop Sulphate of Ammonia—Guarantee					
47001	Analysis	6.04	12.24	6.20	40.84
Armour's Big Crop 18% Superphosphate—Guarantee					
46903	Analysis	6.08	12.23	6.42	41.20
46918	Analysis	15.00	—	—	48.00
46924	Analysis	16.26	—	—	52.03
47007	Analysis	20.00	—	—	64.00
47009	Analysis	20.81	—	—	66.59
47121	Analysis	—	18.60	—	21.60
47232	Analysis	—	18.43	—	22.11
47002	Analysis	—	18.52	—	22.22
47353	Analysis	—	18.83	—	22.60
47392	Analysis	—	18.37	—	22.04
46940	Analysis	—	18.56	—	22.27
46883	Analysis	—	19.03	—	22.84
46968	Analysis	—	18.70	—	22.44
46971	Analysis	—	20.00	—	24.00
Armour's Big Crop 20% Superphosphate—Guarantee					
46940	Analysis	—	19.89	—	23.87
46883	Analysis	—	21.34	—	25.61
46968	Analysis	—	21.36	—	25.63
46971	Analysis	—	9.00	27.00	9.00
Armour's NPK No. 1 9-27-9—Guarantee					
46883	Analysis	8.93	26.36	9.23	70.36
46968	Analysis	9.00	18.00	18.00	70.20
46971	Analysis	8.43	16.98	16.62	65.64
Armour's NPK No. 2 9-18-18—Guarantee					
46883	Analysis	8.96	17.93	17.33	69.25
46968	Analysis	9.32	18.19	18.07	71.53
Geo. L. Barber & Son, Jacksonville, Texas—					
Barber's Eighteen Per Cent Superphosphate—Guarantee					
47085	Analysis	—	18.00	—	21.60
Barber's Sulphate of Ammonia—Guarantee					
47427	Analysis	20.00	—	—	64.00
	Analysis	20.75	—	—	66.40

Table 8. Analysis of commercial fertilizer, season 1931-32—(continued).

Laboratory number	Manufacturer, place of business and brand	Nitrogen—per cent	Available phosphoric acid—per cent	Potash—per cent	Valuation found—per ton
	The Barrett Company, 40 Rector Street, New York, N. Y.—				
	Arcadian Nitrate of Soda—Guarantee	16.00	-----	-----	51.20
46880	Analysis	16.22	-----	-----	51.90
46915	Analysis	16.02	-----	-----	51.26
46946	Analysis	16.20	-----	-----	51.84
46983	Analysis	16.09	-----	-----	51.49
47247	Analysis	16.20	-----	-----	51.84
	Sulphate of Ammonia—Guarantee	20.56	-----	-----	65.79
46925	Analysis	20.92	-----	-----	66.94
	Bryan Cotton Oil & Fertilizer Company, Bryan, Texas—				
	Star Brand 3-10-1 Fertilizer—Guarantee	3.00	10.00	1.00	22.70
46992	Analysis	3.10	12.00	1.10	25.53
	Star Brand Cotton & Corn Fertilizer—Guarantee	3.00	10.00	3.00	24.90
46991	Analysis	3.16	10.21	4.10	26.87
	Star Brand Superphosphate—Guarantee	-----	20.00	-----	24.00
46990	Analysis	-----	20.03	-----	24.04
	Star Brand Tomato Fertilizer—Guarantee	6.00	12.00	6.00	40.20
64989	Analysis	5.46	11.14	8.01	39.65
	City of Houston, 207 City Hall, Houston, Texas—				
	Hu-Actinite—Guarantee	5.00	1.80	-----	18.16
46980	Analysis	5.25	2.53	-----	19.84
47485	Analysis	5.88	3.20	-----	22.66
	Davison-Pick Fertilizers, Incorporated, New Orleans, Louisiana, and Orange, Texas.—				
	Bull Dog Special No. 3103—Guarantee	3.00	10.00	3.00	24.90
46870	Analysis	2.76	10.01	3.09	24.24
	Bull Dog Special No. 484—Guarantee	4.00	8.00	4.00	26.80
46869	Analysis	4.03	9.16	4.62	28.97
47207	Analysis	3.82	7.75	4.22	26.16
47339	Analysis	4.03	9.39	3.74	28.28
47396	Analysis	3.72	8.48	4.04	26.52
47407	Analysis	3.67	8.49	4.06	26.40
47492	Analysis	3.86	8.18	3.75	26.30
	Bull Dog Special No. 4124—Guarantee	4.00	12.00	4.00	31.60
46872	Analysis	4.14	12.05	4.34	32.48
47340	Analysis	4.54	12.59	3.59	33.59
47405	Analysis	4.20	12.44	3.88	32.64
	Bull Dog Special No. 6107—Guarantee	6.00	10.00	7.00	38.90
46871	Analysis	5.95	10.26	6.61	38.62
	Bull Dog Special No. 6126—Guarantee	6.00	12.00	6.00	40.20
46867	Analysis	5.18	13.34	5.96	39.15
46868	Analysis	5.89	12.37	6.55	40.90
46873	Analysis	5.84	12.64	6.31	40.80
47403	Analysis	5.67	12.15	5.45	38.72
47491	Analysis	5.88	11.92	6.18	39.92
	Bull Dog Superphosphate No. 18—Guarantee	-----	18.00	-----	21.60
47401	Analysis	-----	18.46	-----	22.15
	Bull Dog Superphosphate No. 20—Guarantee	-----	20.00	-----	24.00
47404	Analysis	-----	19.61	-----	23.53
	East Texas Cotton Oil Company, Wills Point, Texas—				
	ETCO 4-8-4 Fertilizer—Guarantee	4.00	8.00	4.00	26.80
47429	Analysis	3.75	8.26	4.46	26.82
	ETCO 4-10-0 Fertilizer—Guarantee	4.00	10.00	-----	24.80
46897	Analysis	3.87	11.11	-----	25.71
47239	Analysis	4.07	10.52	-----	25.64
	ETCO 4-12-4 Fertilizer—Guarantee	4.00	12.00	4.00	31.60
47099	Analysis	4.06	12.45	4.52	32.90
47105	Analysis	4.32	12.44	4.81	34.04
47465	Analysis	4.26	12.37	4.48	33.40
	ETCO 6-12-6 Fertilizer—Guarantee	6.00	12.00	6.00	40.20
47357	Analysis	5.75	12.32	6.88	40.75
	ETCO Fertilizer Meal—Guarantee	5.76	-----	-----	18.43

Table 8. Analysis of commercial fertilizer, season 1931-32—(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, Wills Point, Texas—					
Continued.—					
47348	Analysis	5.72	—	—	18.30
	ETCO Meal Formula—Guarantee	3.00	10.00	3.00	24.90
47350	Analysis	4.13	10.33	3.94	29.95
	ETCO Potato Producer—Guarantee	4.00	8.00	4.00	26.80
47100	Analysis	4.34	8.96	3.77	28.79
	ETCO Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
47102	Analysis	20.66	—	—	66.11
47349	Analysis	20.14	—	—	64.45
	ETCO 18% Superphosphate—Guarantee	—	18.00	—	21.60
46896	Analysis	—	18.09	—	21.71
47054	Analysis	—	18.49	—	22.19
47474	Analysis	—	18.73	—	22.48
	ETCO Sweet Potato Special—Guarantee	4.00	10.00	7.00	32.50
47101	Analysis	4.47	10.51	6.43	33.98
Farmers Cotton Oil Company, Winnsboro, Texas—					
	Farmers Fertilizer No. 484—Guarantee	4.00	8.00	4.00	26.80
47277	Analysis	4.08	8.73	4.18	28.14
	Farmers Fertilizer No. 486—Guarantee	4.00	8.00	6.00	29.00
47118	Analysis	4.25	8.45	6.39	30.77
47275	Analysis	4.23	8.47	6.53	30.88
	Farmers Fertilizer No. 4124—Guarantee	4.33	8.21	5.76	29.41
47278	Analysis	4.00	12.00	4.00	31.60
	Analysis	4.39	11.94	4.74	33.59
Fidelity Chemical Corporation, Houston, Texas.—					
	Fidelity 3-10-3 Fertilizer—Guarantee	3.00	10.00	3.00	24.90
46979	Analysis	3.10	9.78	3.71	25.74
47167	Analysis	3.34	10.85	3.22	27.25
47190	Analysis	3.13	9.84	3.23	25.38
47416	Analysis	3.34	10.82	2.71	26.65
47422	Analysis	3.10	10.25	3.19	25.73
	Fidelity 4-8-4 Fertilizer—Guarantee	4.00	8.00	4.00	26.80
46856	Analysis	5.20	7.92	5.39	32.07
46981	Analysis	3.45	9.15	4.57	27.05
47014	Analysis	3.82	8.23	4.43	26.97
47374	Analysis	4.09	8.44	3.69	27.28
47383	Analysis	4.09	9.06	3.23	27.51
	Fidelity 4-8-6 Fertilizer—Guarantee	4.00	8.00	6.00	29.00
46855	Analysis	3.71	8.56	6.28	29.05
47013	Analysis	3.83	8.33	6.67	29.60
47168	Analysis	3.80	8.02	6.69	29.14
47410	Analysis	4.15	9.27	5.72	30.69
	Fidelity 4-10-2 Fertilizer—Guarantee	4.00	10.00	2.00	27.00
46978	Analysis	4.11	10.59	2.37	28.47
	Fidelity 4-10-7 Fertilizer—Guarantee	4.00	10.00	7.00	32.50
46858	Analysis	5.02	10.72	5.37	34.83
	Fidelity 4-12-4 Fertilizer—Guarantee	4.00	12.00	4.00	31.60
46938	Analysis	4.39	12.40	4.05	33.39
46995	Analysis	4.29	12.12	4.10	32.78
47191	Analysis	4.34	11.96	4.34	33.01
47236	Analysis	4.34	11.47	4.31	32.39
47413	Analysis	4.29	12.50	4.19	33.34
	Fidelity 5-15-5 Fertilizer—Guarantee	5.00	15.00	5.00	39.50
46939	Analysis	5.08	14.97	5.20	39.94
46952	Analysis	4.04	14.68	6.04	37.19
46966	Analysis	5.00	15.45	5.07	40.12
	Fidelity 6-10-7 Fertilizer—Guarantee	6.00	10.00	7.00	38.90
46959	Analysis	6.01	10.62	6.54	39.16
47015	Analysis	5.90	10.75	6.31	38.72
47237	Analysis	5.60	10.67	6.47	37.84
	Fidelity 6-12-6 Fertilizer—Guarantee	6.00	12.00	6.00	40.20
46857	Analysis	5.08	11.48	5.37	35.95
46964	Analysis	6.40	12.26	5.16	40.87

Table 8. Analysis of commercial fertilizer, season 1931-32—(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					
46977	Analysis	5.75	12.44	6.07	40.01
46993	Analysis	6.10	11.92	6.28	40.73
47373	Analysis	5.93	12.59	6.08	40.78
46926	Fidelity 9-27-9 Fertilizer—Guarantee	9.00	27.00	9.00	71.10
	Analysis	9.18	27.57	8.13	71.40
	Fidelity Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
46863	Analysis	18.21	—	—	58.27
	Fidelity 18% Superphosphate—Guarantee	—	18.00	—	21.60
46859	Analysis	—	18.16	—	21.79
46994	Analysis	—	18.54	—	22.25
47417	Analysis	—	20.02	—	24.02
	Fidelity 20% Superphosphate—Guarantee	—	20.00	—	24.00
46860	Analysis	—	21.40	—	25.68
46927	Analysis	—	19.86	—	23.83
47412	Analysis	—	20.95	—	25.14
Ford Motor Company, Dearborn, Michigan—					
	Ford Ammonium Sulphate—Guarantee	20.80	—	—	66.56
46864	Analysis	20.82	—	—	66.62
46976	Analysis	21.01	—	—	67.23
Gilmer Cotton Oil & Fertilizer Company, Gilmer, Texas—					
	G. C. O. & F. Co.'s Cotton Grower—Guarantee	4.00	8.00	4.00	26.80
47274	Analysis	3.81	10.23	4.31	29.21
	G. C. O. & F. Co.'s Superior Meal Compound—Guarantee	3.00	10.00	3.00	24.90
47273	Analysis	3.10	10.90	3.34	26.67
	G. C. O. & F. Co.'s Tomato Special—Guarantee	4.00	8.00	6.00	29.00
47106	Analysis	3.71	9.70	6.19	30.32
47271	Analysis	4.04	9.46	5.75	30.61
47272	Analysis	4.04	9.47	6.20	31.11
Gulf States Chemical Company, Harlingen, Texas.—					
	Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
46934	Analysis	20.95	—	—	67.04
International Agricultural Corporation, Atlanta, Georgia, and Texarkana, Texas-Arkansas.—					
	International 4-8-4 Fertilizer—Guarantee	4.00	8.00	4.00	26.80
47287	Analysis	4.04	8.05	4.23	27.24
47454	Analysis	4.08	8.11	4.08	27.28
	International 4-10-2 Fertilizer—Guarantee	4.00	10.00	2.00	27.00
47298	Analysis	4.00	9.85	2.02	26.84
	International 4-12-4 Fertilizer—Guarantee	4.00	12.00	4.00	31.60
47045	Analysis	4.09	12.28	4.09	32.33
	International 6-10-7 Fertilizer—Guarantee	6.00	10.00	7.00	38.90
47044	Analysis	5.73	10.02	7.27	38.36
	International Fertilis Lawn & Garden Fertilizer—Guar.	4.00	12.00	4.00	31.60
47126	Analysis	4.46	11.50	4.52	33.04
	International 18% Superphosphate—Guarantee	—	18.00	—	21.60
47086	Analysis	—	18.59	—	22.31
	International 20% Superphosphate—Guarantee	—	20.00	—	24.00
47135	Analysis	—	20.09	—	24.11
47461	Analysis	—	20.73	—	24.88
	International 4-10-7 Tomato Fertilizer—Guarantee	4.00	10.00	7.00	32.50
47114	Analysis	4.95	10.02	7.10	35.67
47301	Analysis	3.90	10.05	7.05	32.30
	International 4-8-6 Truck Fertilizer—Guarantee	4.00	8.00	6.00	29.00
47043	Analysis	3.72	8.00	6.02	28.12
47113	Analysis	3.90	7.93	5.71	28.28
47125	Analysis	3.93	7.86	6.33	28.97
47134	Analysis	3.68	8.15	5.92	28.07
47288	Analysis	3.95	8.10	5.65	28.58
47294	Analysis	4.06	8.14	5.91	29.26
47296	Analysis	4.09	7.91	6.02	29.20
47302	Analysis	3.78	8.10	5.50	27.87

Table 8. Analysis of commercial fertilizer, season 1931-32—(continued).

Laboratory number	Manufacturer, place of business and brand	Nitrogen—per cent	Available phosphoric acid—per cent	Potash—per cent	Valuation found—per ton
47453	International Agricultural Corporation, Atlanta, Georgia, and Texarkana, Texas-Arkansas.—Continued.— Analysis	3.78	8.09	6.04	28.45
46865	Kelly, Weber & Company, Incorporated, Lake Charles, La.— 18% Basic Slag—Guarantee Analysis	—	*18.00 *17.32	—	14.40 13.86
46866	Muriate of Potash—Guarantee Analysis	—	—	48.00 51.59	52.80 56.75
47496	Weber-King Brand Fertilizer Special No. 0124—Guar. Analysis	—	12.00 11.74	4.00 4.16	18.80 18.67
47398	Weber-King Brand Fertilizer Special No. 4124—Guarantee Analysis	4.00 3.95	12.00 11.71	4.00 4.11	31.60 31.21
47402	Weber-King Brand 18% Superphosphate—Guarantee Analysis	—	18.00 18.59	—	21.60 22.31
47497	Analysis	—	18.13	—	21.76
46984	Lang Fertilizer Company, Galveston, Texas.— Dried Shrimp Waste and Marl, Low Grade—Guarantee Analysis	3.00 1.68	1.00 .91	1.00 .24	11.90 6.73
47456	La-Tex Fertilizer Company, Shreveport, Louisiana.— La-Tex 4-8-6—Guarantee Analysis	4.00 4.11	8.00 8.13	6.00 6.62	29.00 30.19
47148	Longview Cotton Oil Company, Longview, Texas.— Longview Cotton Special—Guarantee Analysis	3.00 3.28	10.00 10.05	3.00 3.05	24.90 25.92
47270	Analysis	3.17	9.59	3.42	25.41
47448	Analysis	3.08	9.58	3.54	25.25
47031	Longview Cotton & Corn Special—Guarantee Analysis	4.00 4.11	12.00 11.59	4.00 4.20	31.60 31.68
47151	Analysis	4.22	12.03	4.65	33.06
47327	Analysis	4.18	12.28	4.56	33.14
47505	Analysis	4.31	11.75	4.25	32.57
47150	Longview Gregg County Special—Guarantee Analysis	4.00 4.06	8.00 8.37	4.00 4.24	26.80 27.69
47329	Analysis	3.90	9.80	3.74	28.35
47029	Longview Prize Fertilizer—Guarantee Analysis	6.00 6.29	12.00 11.85	6.00 6.21	40.20 41.18
47268	Longview Sulphate of Ammonia—Guarantee Analysis	20.00 20.98	—	—	64.00 67.14
47328	Longview Superphosphate—Guarantee Analysis	—	18.00 18.38	—	21.60 22.06
47149	Longview Supreme Cotton Grower—Guarantee Analysis	4.00 4.00	10.00 8.72	2.00 2.70	27.00 26.23
47269	Longview Truck Special—Guarantee Analysis	4.00 4.00	8.00 7.94	6.00 7.56	29.00 30.65
47030	Longview Vegetable Fertilizer—Guarantee Analysis	6.00 6.57	10.00 9.44	7.00 7.40	38.90 40.49
47146	Marshall Cotton Oil Company, Marshall, Texas.— Marshall Eclipse Fertilizer 3-10-3—Guarantee Analysis	3.00 2.85	10.00 10.00	3.00 3.12	24.90 24.55
47305	Analysis	3.00	9.87	3.43	25.21
47324	Analysis	2.91	10.28	3.17	25.14
47451	Analysis	3.06	9.92	3.74	25.80
47028	Marshall Fertilizer 6-10-7—Guarantee Analysis	6.00 6.28	10.00 11.16	7.00 7.21	38.90 41.42
47027	Marshall Garden Fertilizer 4-8-6—Guarantee Analysis	4.00 4.15	8.00 8.63	6.00 5.95	29.00 30.19
47322	Analysis	4.50	8.96	6.19	31.96
47452	Analysis	4.20	8.43	6.25	30.44
47025	Marshall Wonder Fertilizer 4-12-4—Guarantee Analysis	4.00 3.80	12.00 11.74	4.00 3.76	31.60 30.39

*Total phosphoric acid

Table 8. Analysis of commercial fertilizer, season 1931-32—(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					
47144	Analysis	3.84	10.99	3.78	29.64
47145	Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
47143	Analysis	20.84	—	—	66.69
	Trucker's Delight 4-8-4—Guarantee	4.00	8.00	4.00	26.80
47026	Analysis	3.89	8.54	4.01	27.11
47145	Analysis	3.87	8.62	4.01	27.13
47147	Analysis	4.18	8.66	3.82	27.97
47304	Analysis	4.06	8.27	3.86	27.16
47323	Analysis	4.13	8.25	4.43	27.99
47449	Analysis	4.05	8.45	3.82	27.30
47450	Analysis	4.07	8.48	4.40	28.04
Meridian Fertilizer Factory, Shreveport, Louisiana.—					
	Meridian 4-8-10—Guarantee	4.00	8.00	10.00	33.40
47290	Analysis	3.81	8.03	9.59	32.38
	Meridian Home Mixture—Guarantee	3.00	10.00	3.00	24.90
46997	Analysis	3.14	10.74	3.84	26.61
47077	Analysis	3.12	10.66	3.48	26.60
47165	Analysis	3.08	10.28	2.77	25.25
47175	Analysis	3.12	10.18	3.44	25.98
47189	Analysis	3.21	10.22	2.63	25.42
47318	Analysis	3.09	10.14	3.18	25.56
47455	Analysis	3.06	10.60	3.29	26.13
47489	Analysis	3.12	10.63	3.12	26.17
	Meridian Magnolia State Formula—Guarantee	4.00	8.00	4.00	26.80
46888	Analysis	4.13	8.47	4.01	27.79
47078	Analysis	3.86	8.00	4.51	26.91
47103	Analysis	3.97	8.11	4.28	27.14
47166	Analysis	3.71	9.39	3.31	26.78
47234	Analysis	3.90	7.91	4.60	27.03
47317	Analysis	4.27	7.96	4.48	28.14
47326	Analysis	4.13	8.07	4.41	27.75
	Meridian Majestic Mixture—Guarantee	5.00	15.00	5.00	39.50
46954	Analysis	5.81	13.96	5.86	41.79
	Meridian Perfect Guano—Guarantee	6.00	12.00	6.00	40.20
47084	Analysis	5.75	11.81	6.04	39.21
	Meridian Perfection Compound—Guarantee	4.00	12.00	4.00	31.60
46955	Analysis	4.18	11.83	4.38	32.40
47076	Analysis	4.53	12.35	4.93	34.74
47153	Analysis	4.08	12.60	4.01	32.59
47174	Analysis	4.05	12.54	4.42	32.87
47248	Analysis	4.00	12.03	4.14	31.79
47282	Analysis	4.00	11.92	4.47	32.02
	Meridian Perfection Superphosphate—Guarantee	—	18.00	—	21.60
47508	Analysis	—	19.79	—	23.75
	Meridian Southern Mixture—Guarantee	4.00	10.00	—	24.80
46889	Analysis	3.93	11.41	—	26.27
	Meridian Southern Standard—Guarantee	4.00	10.00	2.00	27.00
47083	Analysis	5.89	10.30	2.93	34.43
47233	Analysis	5.68	9.77	2.88	33.07
47503	Analysis	5.68	10.33	3.63	34.57
	Meridian Special Mixture—Guarantee	6.00	10.00	7.00	38.90
46956	Analysis	6.04	12.58	6.68	41.78
	Meridian Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
47257	Analysis	20.74	—	—	66.87
47509	Analysis	20.72	—	—	66.30
	Meridian Truckers Special—Guarantee	4.00	8.00	6.00	29.00
46996	Analysis	4.04	8.31	5.79	29.27
47082	Analysis	3.93	8.79	6.01	29.74
47104	Analysis	4.02	9.12	5.65	30.02
47152	Analysis	4.06	8.17	5.86	29.24
47233	Analysis	3.64	8.25	6.02	28.17
47284	Analysis	3.97	8.55	6.25	29.84
47291	Analysis	3.98	8.39	6.13	29.55
47297	Analysis	4.01	8.01	6.06	29.11

Table 8. Analysis of commercial fertilizer, season 1931-32—(continued).

Laboratory number	Manufacturer, place of business and brand	Nitrogen—per cent	Available phosphoric acid—per cent	Potash—per cent	Valuation found—per ton
	Meridian Fertilizer Factory, Shreveport, Louisiana—				
	Meridian Truckers Special—Guarantee—Continued	4.00	8.00	6.00	29.00
47319	Analysis	4.27	8.37	6.00	30.30
47325	Analysis	4.04	8.61	5.51	29.32
	Muriate of Potash—Guarantee			48.00	52.80
47259	Analysis			51.29	56.42
	Mixson Brothers, Kirbyville, Texas.—				
	Jasco Brand Fertilizer 3-10-3—Guarantee	3.00	10.00	3.00	24.90
47193	Analysis	3.35	10.59	4.83	28.74
	Jasco Brand Fertilizer 3-10-8—Guarantee	3.00	10.00	8.00	30.40
47195	Analysis	3.12	10.19	7.71	30.69
	Jasco Brand Fertilizer 4-8-4—Guarantee	4.00	8.00	4.00	26.80
47196	Analysis	4.51	8.85	4.28	29.76
47499	Analysis	4.32	9.50	4.52	30.19
	Jasco Brand Fertilizer 4-12-4—Guarantee	4.00	12.00	4.00	31.60
47194	Analysis	4.38	12.23	3.55	32.61
47500	Analysis	4.62	13.12	4.13	35.06
	18% Superphosphate—Guarantee			18.00	21.60
47395	Analysis		18.61		22.33
	Oil Mill & Fertilizer Works, Henderson, Texas—				
	Henderson 3103—Guarantee	3.00	10.00	3.00	24.90
47021	Analysis	3.02	10.55	3.33	25.98
47264	Analysis	3.35	10.83	3.52	27.59
47432	Analysis	3.16	10.45	3.36	26.35
	Henderson 484—Guarantee	4.00	8.00	4.00	26.80
47022	Analysis	3.63	8.08	4.38	26.14
47261	Analysis	3.72	8.36	4.43	26.80
47265	Analysis	3.86	8.38	4.31	27.15
47330	Analysis	3.70	7.90	4.71	26.50
47433	Analysis	4.27	8.97	4.42	29.28
	Henderson 486—Guarantee	4.00	8.00	6.00	29.00
47024	Analysis	4.14	8.44	7.11	31.20
47262	Analysis	4.13	8.13	6.25	29.86
47263	Analysis	4.24	8.71	6.24	30.88
	Henderson 4124—Guarantee	4.00	12.00	4.00	31.60
47331	Analysis	4.31	12.16	4.05	32.84
	Henderson 693—Guarantee	6.00	9.00	3.00	33.30
47434	Analysis	5.73	9.90	3.52	34.09
	Henderson 6107—Guarantee	6.00	10.00	7.00	38.90
47023	Analysis	5.87	9.75	7.20	38.40
47266	Analysis	5.64	10.48	7.12	38.46
	Henderson 6126—Guarantee	6.00	12.00	6.00	40.20
47267	Analysis	6.05	11.75	5.89	39.94
	Henderson 18% Superphosphate—Guarantee		18.00		21.60
47252	Analysis		18.67		22.40
	Palestine Oil Mill & Fertilizer Company, Palestine, Texas—				
	Cottonseed Meal Fertilizer—Guarantee	6.88	1.00	1.00	24.32
47091	Analysis	6.48	2.38	1.49	25.24
	Palestine Blood & Bone 3103—Guarantee	3.00	10.00	3.00	24.90
46902	Analysis	4.01	10.04	2.58	27.72
	Palestine Blue Star 0-15-6—Guarantee		15.00	6.00	24.60
47235	Analysis		14.65	5.23	23.33
47356	Analysis		15.15	5.64	24.38
	Palestine Blue Star 4100—Guarantee	4.00	10.00		24.80
46891	Analysis	4.21	11.00		26.67
46923	Analysis	4.10	10.24		25.41
47063	Analysis	3.86	9.28		23.49
	Palestine Blue Star 4124—Guarantee	4.00	12.00	4.00	31.60
47058	Analysis	3.82	10.04	4.63	29.36
47238	Analysis	3.91	9.88	4.72	29.56
47260	Analysis	3.89	10.36	4.12	29.41
47426	Analysis	3.97	10.02	4.76	29.96

Table 8. Analysis of commercial fertilizer, season 1931-32—(continued).

Laboratory number	Manufacturer, place of business and brand	Nitrogen—per cent	Available phosphoric acid—per cent	Potash—per cent	Valuation found—per ton
	Palestine Oil Mill & Fertilizer Company, Palestine, Texas.—Continued.—				
	Palestine Blue Star 5155—Guarantee	5.00	15.00	5.00	39.50
47240	Analysis	4.88	14.29	4.82	38.07
	Palestine Blue Star 6126—Guarantee	6.00	12.00	6.00	40.20
47062	Analysis	3.56	17.26	2.18	34.50
47230	Analysis	5.53	11.42	6.90	38.99
	Palestine Cotton Producer—Guarantee	3.00	10.00	3.00	24.90
47064	Analysis	4.01	10.53	3.44	29.25
	Palestine 18% Superphosphate—Guarantee	—	18.00	—	21.60
46890	Analysis	—	19.09	—	22.91
47090	Analysis	—	17.55	—	21.06
	Palestine Tomato Special—Guarantee	4.00	8.00	6.00	29.00
46921	Analysis	3.88	9.01	6.35	30.22
47087	Analysis	3.91	8.87	6.40	30.19
47231	Analysis	3.90	8.08	6.03	28.81
47355	Analysis	3.74	8.23	6.43	28.92
47437	Analysis	3.70	8.11	6.24	28.43
47478	Analysis	3.66	8.06	6.10	28.09
	Palestine Upland Cotton—Guarantee	4.00	8.00	4.00	26.80
46922	Analysis	3.63	10.06	4.22	28.33
47059	Analysis	3.69	8.64	4.25	26.86
47229	Analysis	3.68	8.32	4.54	26.75
47354	Analysis	3.61	8.75	4.18	26.65
47425	Analysis	4.06	8.50	4.43	28.06
47436	Analysis	3.79	8.42	4.08	26.72
47477	Analysis	3.86	8.71	4.36	27.60
	Pate Brothers Fertilizer Works, Sulphur Springs, Texas.—				
	Pate's 3-10-3—Guarantee	3.00	10.00	3.00	24.90
47279	Analysis	3.00	11.14	3.34	26.64
	Pate's 4-8-4—Guarantee	4.00	8.00	4.00	26.80
47115	Analysis	4.22	8.70	4.28	28.65
47303	Analysis	4.07	8.46	4.08	27.66
47463	Analysis	3.90	9.46	4.20	28.45
	Pate's 4-8-6—Guarantee	4.00	8.00	6.00	29.00
47116	Analysis	4.11	9.09	6.12	30.79
47129	Analysis	4.33	8.83	6.07	31.14
47280	Analysis	4.03	9.55	6.02	30.98
47428	Analysis	4.20	9.49	7.17	32.72
47507	Analysis	4.26	9.02	6.01	31.06
	Pate's 4-12-4—Guarantee	4.00	12.00	4.00	31.60
47117	Analysis	4.00	12.21	4.17	32.04
47249	Analysis	4.01	12.41	4.36	32.52
47464	Analysis	3.84	12.32	4.52	32.04
47473	Analysis	3.95	12.69	4.21	32.50
	Pate's Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
47281	Analysis	20.81	—	—	66.59
	Pate's 20% Superphosphate—Guarantee	—	20.00	—	24.00
47462	Analysis	—	20.21	—	24.25
	Pelican Fertilizer Works, Shreveport, Louisiana.—				
	Pelican Improved Guano—Guarantee	4.00	8.00	4.00	26.80
47186	Analysis	3.82	8.42	4.00	26.72
	Pelican Perfect Guano—Guarantee	3.00	10.00	3.00	24.90
47187	Analysis	3.15	10.26	3.06	25.76
	Pelican Perfection Compound—Guarantee	4.00	12.00	4.00	31.60
47188	Analysis	4.04	12.19	4.36	32.36
	Pittsburg Cotton Oil Company, Pittsburg, Texas.—				
	Double Circle Fertilizer No. 484—Guarantee	4.00	8.00	4.00	26.80
47109	Analysis	3.71	8.73	5.03	27.88
47127	Analysis	3.77	8.87	4.78	27.96
	Double Circle Fertilizer 486—Guarantee	4.00	8.00	6.00	29.00
47110	Analysis	3.97	8.75	6.44	30.28

Table 8. Analysis of commercial fertilizer, season 1931-32—(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.—				
	Eighteen percent Superphosphate—Guarantee		18.00		21.60
47306	Analysis		19.09		22.91
47307	Analysis		18.25		21.90
	Quadruple Feed & Fertilizer Company, Beaumont, Texas.—				
	Quadruple Brand Fertilizer, Low Grade Guarantee	1.00	*3.00	1.00	6.70
47397	Analysis	1.20	2.88	1.67	7.98
47495	Analysis	1.15	3.01	1.50	7.74
	Shreveport Fertilizer Works, Shreveport, Louisiana.—				
	American Nitrate of Soda—Guarantee	16.00			51.20
47490	Analysis	15.57			49.82
	Lion 3-10-3 Blood and Bone—Guarantee	3.00	10.00	3.00	24.90
47142	Analysis	3.36	10.12	3.04	26.23
	Lion 4-8-4 Cotton Producer—Guarantee	4.00	8.00	4.00	26.80
46900	Analysis	4.14	9.47	4.01	29.02
47055	Analysis	3.81	8.03	4.12	26.36
47122	Analysis	4.01	8.53	4.41	27.92
47133	Analysis	3.76	7.92	5.49	27.57
47140	Analysis	4.02	8.14	3.67	26.67
47178	Analysis	3.57	8.10	4.99	26.63
47181	Analysis	3.84	7.78	5.45	27.63
47254	Analysis	3.67	7.62	3.80	25.06
47475	Analysis	3.95	8.47	4.01	27.21
	Lion 4-10-2 Extrafine Mixture—Guarantee	4.00	10.00	2.00	27.00
47467	Analysis	4.02	10.01	2.84	27.99
	Lion 6-10-7 La-Tex Special—Guarantee	6.00	10.00	7.00	38.90
47253	Analysis	6.52	9.55	9.21	42.45
	Lion 3-10-3 Meal Formula—Guarantee	3.00	10.00	3.00	24.90
47179	Analysis	2.91	10.18	3.36	25.23
47180	Analysis	3.54	10.69	4.21	28.79
47204	Analysis	3.37	10.89	1.72	25.74
	Lion 48% Muriate of Potash—Guarantee			48.00	52.80
47042	Analysis			48.28	53.11
	Lion 4-10-0 Non-Potassic—Guarantee	4.00	10.00		24.80
47056	Analysis	4.56	10.68		27.41
	Lion 4-8-6 Special Truck—Guarantee	4.00	8.00	6.00	29.00
46901	Analysis	4.09	8.81	5.92	30.17
47040	Analysis	4.19	8.40	5.42	29.45
47107	Analysis	4.29	8.56	6.04	30.64
47141	Analysis	4.00	7.98	6.06	29.05
47439	Analysis	4.15	8.61	6.17	30.40
47468	Analysis	3.97	7.97	6.95	29.91
47472	Analysis	3.95	8.08	4.49	27.28
	Lion 4-12-4 Superior Cotton Grower—Guarantee	4.00	12.00	4.00	31.60
47123	Analysis	4.17	11.91	4.56	32.00
47203	Analysis	4.16	11.98	4.21	31.32
47213	Analysis	4.09	11.97	4.17	32.04
47457	Analysis	4.17	12.82	4.39	33.55
47498	Analysis	4.14	12.69	4.17	33.07
	Lion 18% Superphosphate—Guarantee		18.00		21.60
46920	Analysis		18.37		22.04
47041	Analysis		18.45		22.14
47108	Analysis		17.41		20.89
47124	Analysis		18.25		21.90
47214	Analysis		18.15		21.78
	Smith County Cotton Oil & Fertilizer Co., Tyler, Texas.—				
	Smico 4-8-4—Guarantee	4.00	8.00	4.00	26.80
47035	Analysis	4.12	9.21	3.78	28.39
47088	Analysis	4.00	9.63	3.84	28.58
47255	Analysis	4.00	9.37	4.01	28.45
47335	Analysis	3.93	8.78	4.04	27.56
47444	Analysis	3.73	9.24	4.39	27.86

*Total phosphoric acid.

Table 8. Analysis of commercial fertilizer, season 1931-32—(continued).

Laboratory number	Manufacturer, place of business and brand	Nitrogen—per cent	Available phosphoric acid—per cent	Potash—per cent	Valuation found—per ton
	Smith County Cotton Oil & Fertilizer Company, Tyler, Texas.—Continued.—				
	Smico 4-8-6—Guarantee	4.00	8.00	6.00	29.00
47036	Analysis	4.08	9.33	6.26	31.15
47338	Analysis	4.10	9.16	6.49	31.25
47466	Analysis	4.31	8.60	6.46	31.22
	Smico 4-10-0—Guarantee	4.00	10.00	—	24.80
47037	Analysis	4.10	10.77	—	26.04
	Smico 4-12-4—Guarantee	4.00	12.00	4.00	31.60
47336	Analysis	4.01	12.46	4.37	32.59
	Smico 6-9-3—Guarantee	6.00	9.00	3.00	33.30
47443	Analysis	6.08	9.87	3.39	35.03
	Smico Muriate of Potash—Guarantee	—	—	48.00	52.80
47440	Analysis	—	—	48.83	53.71
	Smico Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
47337	Analysis	20.53	—	—	65.70
	Smico 18% Superphosphate—Guarantee	—	18.00	—	21.60
47089	Analysis	—	18.85	—	22.62
47096	Analysis	—	18.00	—	21.60
47334	Analysis	—	18.50	—	22.20
	South Texas Cotton Oil Company, Houston, Texas—				
	Fertilo—Guarantee	4.00	8.00	4.00	26.80
47411	Analysis	4.18	8.22	4.13	27.78
	Swift & Company Fertilizer Works, Harvey and Shreveport, Louisiana, and Houston, Texas—				
	Muriate of Potash—Guarantee	—	—	48.00	52.80
46932	Analysis	—	—	47.14	51.85
	Pioneer 4-12-4—Guarantee	4.00	12.00	4.00	31.60
46892	Analysis	4.18	11.86	3.80	31.79
	Pioneer 6-12-6—Guarantee	6.00	12.00	6.00	40.20
46893	Analysis	6.17	12.04	6.01	40.80
	Steamed Bone Meal Fertilizer—Guarantee	1.25	*29.00	—	27.20
46878	Analysis	1.69	*30.07	—	29.47
	Sulphate of Ammonia—Guarantee	20.00	—	—	64.00
46874	Analysis	20.92	—	—	66.94
47483	Analysis	20.00	—	—	64.00
	Sulphate of Potash—Guarantee	—	—	48.00	52.80
46931	Analysis	—	—	48.09	52.90
	Swift's Red Steer 3-10-3—Guarantee	3.00	10.00	3.00	24.90
47079	Analysis	3.05	9.46	3.39	24.84
47206	Analysis	3.08	10.62	2.83	25.71
47211	Analysis	3.11	9.98	3.86	26.18
47332	Analysis	3.39	10.34	3.45	27.06
47362	Analysis	3.15	10.33	3.44	26.26
47364	Analysis	3.16	10.04	3.27	25.76
47435	Analysis	3.11	10.54	3.56	26.30
47506	Analysis	3.02	10.70	2.86	25.65
	Swift's Red Steer 3-10-8—Guarantee	3.00	10.00	8.00	30.40
46933	Analysis	3.12	10.17	9.90	33.07
	Swift's Red Steer 4-8-4—Guarantee	4.00	8.00	4.00	26.80
46895	Analysis	3.82	9.07	4.13	27.64
46914	Analysis	3.77	7.90	3.89	25.82
46945	Analysis	4.93	10.62	5.47	34.54
47039	Analysis	4.19	8.54	3.95	28.01
47049	Analysis	4.00	8.01	4.08	26.90
47097	Analysis	4.18	7.94	4.02	27.33
47132	Analysis	4.06	8.38	4.01	27.40
47154	Analysis	4.02	8.21	4.03	27.14
47183	Analysis	4.12	8.72	4.14	28.19
47241	Analysis	4.10	7.75	4.03	26.85
47289	Analysis	4.04	8.07	4.03	27.04
47292	Analysis	4.12	8.12	4.01	27.33

*Total phosphoric acid

Table 8. Analysis of commercial fertilizer, season 1931-32—(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, Louisiana, and Houston, Texas.—Continued.—				
	Swift's Red Steer 4-8-4—Guarantee—Continued.—	4.00	8.00	4.00	26.80
47300	Analysis	4.12	8.01	5.82	29.19
47321	Analysis	3.99	8.40	4.08	27.34
47333	Analysis	4.04	8.32	4.10	27.42
47347	Analysis	3.89	8.02	4.04	26.51
47367	Analysis	3.84	8.15	4.48	27.00
47371	Analysis	4.02	8.21	3.53	26.59
47394	Analysis	4.04	8.05	4.12	27.12
47421	Analysis	4.12	8.07	4.57	27.89
47424	Analysis	4.05	8.20	4.24	27.46
47445	Analysis	4.03	8.53	4.03	27.57
47479	Analysis	3.52	8.02	4.54	25.87
	Swift's Red Steer 4-8-6—Guarantee	4.00	8.00	6.00	29.00
46982	Analysis	3.79	7.99	6.02	28.34
47095	Analysis	4.04	7.86	5.87	28.82
47111	Analysis	4.08	8.19	5.83	29.30
47128	Analysis	4.02	7.88	6.14	29.07
47156	Analysis	4.04	8.14	6.08	29.39
47256	Analysis	3.95	8.07	6.03	28.95
47293	Analysis	4.10	7.95	6.02	29.28
47346	Analysis	4.00	8.37	5.30	28.67
	Swift's Red Steer 4-8-10—Guarantee	4.00	8.00	10.00	33.40
47112	Analysis	4.10	8.74	9.21	33.74
	Swift's Red Steer 4-10-0—Guarantee	4.00	10.00	—	24.80
46894	Analysis	4.13	10.37	—	25.66
	Swift's Red Steer 4-10-7—Guarantee	4.00	10.00	7.00	32.50
46909	Analysis	4.04	10.51	7.00	33.24
	Swift's Red Steer 4-12-4—Guarantee	4.00	12.00	4.00	31.60
46944	Analysis	4.15	11.84	4.30	32.22
46947	Analysis	4.18	12.69	3.49	32.45
47048	Analysis	4.08	11.49	4.28	31.56
47081	Analysis	4.15	11.64	4.24	31.91
47136	Analysis	4.30	12.42	4.33	33.42
47173	Analysis	4.16	12.25	4.16	32.59
47192	Analysis	4.18	12.07	4.13	32.40
47205	Analysis	4.12	12.11	4.61	32.78
47210	Analysis	4.10	12.21	3.36	31.47
47212	Analysis	4.06	12.00	4.44	32.27
47216	Analysis	4.08	12.23	4.16	32.32
47320	Analysis	4.25	12.35	4.39	33.25
47363	Analysis	4.06	12.21	4.29	32.36
47366	Analysis	4.32	12.31	4.22	33.23
47393	Analysis	4.12	12.44	4.11	32.63
47418	Analysis	4.05	12.41	4.16	32.43
47420	Analysis	4.17	12.44	4.29	32.99
47460	Analysis	4.14	12.58	4.27	33.05
47482	Analysis	4.19	12.04	4.08	32.35
47488	Analysis	4.07	12.35	4.13	32.38
	Swift's Red Steer 5-15-5—Guarantee	5.00	15.00	5.00	39.50
46885	Analysis	5.21	14.84	5.61	40.65
46887	Analysis	5.33	15.33	5.17	41.15
46951	Analysis	5.16	15.09	5.22	40.36
47182	Analysis	5.14	14.08	5.01	38.86
	Swift's Red Steer 6-10-7—Guarantee	6.00	10.00	7.00	38.90
46886	Analysis	5.97	10.56	7.39	39.90
46907	Analysis	6.00	9.95	7.18	39.04
46942	Analysis	6.01	9.96	7.37	39.29
47080	Analysis	6.00	10.08	6.70	38.67
47155	Analysis	5.86	10.03	7.00	38.49
47201	Analysis	5.78	10.25	7.58	39.14
47469	Analysis	5.93	10.25	7.83	39.89
	Swift's Red Steer 6-12-6—Guarantee	6.00	12.00	6.00	40.20
46876	Analysis	6.02	13.37	6.85	42.84
46948	Analysis	6.02	12.39	6.08	40.82

Table 8. Analysis of commercial fertilizer, season 1931-32—(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, Louisiana, and Houston, Texas.—Continued.—				
	Swift's Red Steer 6-12-6—Guarantee.—Continued.—	6.00	12.00	6.00	40.20
46950	Analysis	5.63	12.47	6.05	39.64
46965	Analysis	6.05	12.62	5.93	41.02
47088	Analysis	6.12	12.41	6.09	41.17
47066	Analysis	6.05	12.37	6.05	40.86
47067	Analysis	6.14	11.79	5.80	40.18
47197	Analysis	5.97	12.65	5.59	40.43
47299	Analysis	5.92	12.28	6.01	40.29
47388	Analysis	6.03	12.05	6.38	40.78
47423	Analysis	6.16	12.29	6.22	41.30
	Swift's Red Steer 6-18-6—Guarantee	6.00	18.00	6.00	47.40
47368	Analysis	6.30	18.12	6.11	48.62
	Swift's Red Steer 8-24-8—Guarantee	8.00	24.00	8.00	63.20
46908	Analysis	8.06	23.21	7.54	61.93
46912	Analysis	7.63	22.38	7.62	59.66
46949	Analysis	8.09	24.35	8.74	64.72
46967	Analysis	8.14	24.09	8.01	63.77
46969	Analysis	8.44	24.49	8.33	65.56
	<i>Swift's Red Steer 10-20-10—Guarantee</i>	<i>10.00</i>	<i>20.00</i>	<i>10.00</i>	<i>67.00</i>
46877	Analysis	9.14	19.86	9.03	63.01
46943	Analysis	9.80	19.77	9.74	65.79
46970	Analysis	10.12	20.11	10.02	67.53
	Swift's Red Steer 18% Superphosphate—Guarantee		18.00		21.60
46913	Analysis		18.82		22.58
47050	Analysis		18.19		21.83
47094	Analysis		18.28		21.91
47098	Analysis		18.05		21.66
47242	Analysis		17.77		21.32
47372	Analysis		18.14		21.77
47415	Analysis		18.59		22.31
	Swift's Red Steer 20% Superphosphate—Guarantee		20.00		24.00
46875	Analysis		20.00		24.00
47198	Analysis		20.62		24.74
47202	Analysis		20.10		24.12
47217	Analysis		20.12		24.14
47365	Analysis		20.40		24.48
47408	Analysis		20.63		24.76
	Vigoro—Guarantee	4.00	12.00	4.00	31.60
46879	Analysis	4.44	12.22	4.40	33.71
47209	Analysis	4.54	12.79	4.32	34.63
47285	Analysis	4.36	12.30	4.02	33.13
	Synthetic Nitrogen Products Corporation, 285 Madison Avenue, New York, N. Y.—				
	Calcium Nitrate (Nitrate of Lime)—Guarantee	15.00			48.00
46936	Analysis	14.59			46.69
	Texas Chemical Company, Houston, Texas.—				
	T. C. C. Raw Bone Meal—Guarantee	3.70	*22.00		29.44
47493	Analysis	4.34	23.25		32.49
	Texas Farmers Cooperative Association, Dallas, Texas.—				
	Cooperative Association 18% Superphosphate—Guarantee		18.00		21.60
47250	Analysis		18.66		22.39
	Texas Farm Products Co., Nacogdoches, Texas.—				
	Lone Star Brand 3-10-3 Fertilizer	3.00	10.00	3.00	24.90
47016	Analysis	3.13	9.90	3.03	25.23
47164	Analysis	3.07	9.81	2.90	24.78
47381	Analysis	3.23	10.39	3.01	26.12
	Lone Star Brand 4-8-4 Fertilizer	4.00	8.00	4.00	26.80
47061	Analysis	4.00	8.17	3.73	26.70
47065	Analysis	3.94	8.12	4.04	26.79
47162	Analysis	3.81	7.78	4.03	25.96

*Total phosphoric acid

Table 8. Analysis of commercial fertilizer, season 1931-32—(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.—	4.00	8.00	4.00	26.80
47171	Analysis	3.88	7.87	4.18	26.46
47218	Analysis	4.37	8.13	4.28	28.46
47224	Analysis	3.89	8.28	4.07	26.87
47370	Analysis	3.80	8.07	4.37	26.65
47377	Analysis	3.78	8.08	4.40	26.64
47385	Analysis	3.39	8.25	4.36	25.55
47476	Analysis	4.04	8.42	3.56	26.95
	Lone Star Brand 4-10-0 Fertilizer—Guarantee	4.00	10.00	—	24.80
47012	Analysis	3.53	10.66	—	24.09
	Lone Star Brand 4-12-4 Fertilizer—Guarantee	4.00	12.00	4.00	31.60
47003	Analysis	3.60	12.60	4.00	31.04
47017	Analysis	3.73	12.41	4.21	31.46
47070	Analysis	3.73	12.24	4.23	31.28
47172	Analysis	4.11	12.00	4.14	32.10
47184	Analysis	3.92	12.32	4.19	31.93
47219	Analysis	4.00	12.20	4.07	31.92
47378	Analysis	4.05	12.04	4.03	31.84
47384	Analysis	4.02	12.63	4.03	32.45
47389	Analysis	3.92	12.37	4.06	31.85
47487	Analysis	3.88	12.62	3.83	31.77
	Lone Star Brand 6-10-7 Fertilizer—Guarantee	6.00	10.00	7.00	38.90
47004	Analysis	6.29	10.35	6.80	40.03
47011	Analysis	6.08	10.07	7.25	39.52
47018	Analysis	5.80	10.71	6.66	38.74
47060	Analysis	6.24	10.34	7.02	40.10
47075	Analysis	6.43	9.91	6.54	39.66
47163	Analysis	6.33	10.12	7.00	40.10
47185	Analysis	5.93	10.37	6.74	38.83
47223	Analysis	6.00	10.28	7.00	39.24
47227	Analysis	5.40	10.83	6.79	37.75
47369	Analysis	5.60	10.59	6.30	37.56
47502	Analysis	5.77	10.28	7.19	38.71
	Lone Star Brand 6-12-6 Fertilizer—Guarantee	6.00	12.00	6.00	40.20
47071	Analysis	6.02	12.40	5.76	40.48
47157	Analysis	5.82	12.14	6.06	39.86
47215	Analysis	5.64	11.53	5.78	38.25
47228	Analysis	5.32	12.84	6.05	39.09
47382	Analysis	5.45	13.24	5.44	39.31
	Lone Star Brand 18% Superphosphate—Guarantee	—	18.00	—	21.60
47019	Analysis	—	18.34	—	22.01
47170	Analysis	—	17.80	—	21.36
47380	Analysis	—	18.76	—	22.51
	Lone Star Brand 20% Superphosphate—Guarantee	—	20.00	—	24.00
47005	Analysis	—	18.63	—	22.36
47020	Analysis	—	20.51	—	24.68
47161	Analysis	—	20.60	—	24.72
47169	Analysis	—	20.43	—	24.52
47379	Analysis	—	21.87	—	26.24
47390	Analysis	—	21.28	—	25.54
47501	Analysis	—	21.44	—	25.73
Thomas Self, Crockett, Texas.—					
	Crockett 4-8-4 Fertilizer—Guarantee	4.00	8.00	4.00	26.80
47358	Analysis	4.94	10.28	5.18	33.85
	Crockett 4-12-4 Fertilizer—Guarantee	4.00	12.00	4.00	31.60
47359	Analysis	4.41	12.52	4.28	33.84
	Crockett 6-10-7 Fertilizer—Guarantee	6.00	10.00	7.00	38.90
47360	Analysis	5.85	10.13	7.54	39.17
	Crockett 18% Superphosphate—Guarantee	—	18.00	—	21.60
47480	Analysis	—	20.04	—	24.05
	Crockett 20% Superphosphate—Guarantee	—	20.00	—	24.00
47361	Analysis	—	20.82	—	24.98

Table 8. Analysis of commercial fertilizer, season 1931-32—(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.—				
	Eighteen Per Cent Superphosphate—Guarantee		18.00		21.60
47069	Analysis		18.25		21.90
	Heart Brand Fertilizer No. 3-10-3—Guarantee	3.00	10.00	3.00	24.90
47343	Analysis	2.90	11.96	3.66	27.66
	Heart Brand Fertilizer No. 4-8-4—Guarantee	4.00	8.00	4.00	26.80
47342	Analysis	4.00	9.08	4.23	28.35
47447	Analysis	3.58	8.12	4.23	25.85
	Heart Brand Fertilizer No. 4-8-6—Guarantee	4.00	8.00	6.00	29.00
47032	Analysis	3.95	8.41	6.03	29.36
47243	Analysis	4.06	8.64	5.83	29.77
	Heart Brand Fertilizer No. 4-12-4—Guarantee	4.00	12.00	4.00	31.60
47033	Analysis	4.36	11.91	3.82	32.44
47244	Analysis	4.18	11.57	4.24	31.92
47438	Analysis	3.85	10.64	4.48	30.02
	Heart Brand Fertilizer No. 6-9-3—Guarantee	6.00	9.00	3.00	33.30
47034	Analysis	5.78	8.70	3.16	32.42
47341	Analysis	5.68	9.26	3.38	33.01
47442	Analysis	6.10	9.05	2.86	33.53
	Heart Brand Fertilizer No. 6-10-7—Guarantee	6.00	10.00	7.00	38.90
47068	Analysis	5.71	10.96	7.26	39.41
47430	Analysis	5.64	10.87	6.38	38.11
	Heart Brand Fertilizer No. 6-12-6—Guarantee	6.00	12.00	6.00	40.20
47345	Analysis	6.07	11.80	5.30	39.41
47441	Analysis	5.59	10.79	6.57	38.07
47470	Analysis	5.88	10.99	6.65	39.33
	Virginia-Carolina Chemical Corporation, Shreveport, La.—				
	Muriate of Potash—Guarantee			48.00	52.80
46987	Analysis			47.83	52.61
	Sulphate of Ammonia—Guarantee	20.00			64.00
47221	Analysis	20.82			66.62
	V-C Big Giant Crop Grower—Guarantee	6.00	12.00	6.00	40.20
47245	Analysis	6.14	11.53	6.58	40.73
	V-C Blood, Bone and Potash—Guarantee	3.00	10.00	3.00	24.90
47313	Analysis	3.23	10.39	3.34	26.48
	V-C Fruit & Truck Special—Guarantee	6.00	10.00	7.00	38.90
46899	Analysis	6.33	10.94	7.74	41.90
47246	Analysis	5.78	10.44	7.00	38.73
	V-C Good Luck Fertilizer—Guarantee	4.00	8.00	4.00	26.80
46898	Analysis	3.75	10.05	3.39	27.79
47139	Analysis	4.07	10.67	2.73	28.82
47199	Analysis	3.76	9.25	3.76	27.27
47344	Analysis	3.92	8.34	4.01	26.96
47446	Analysis	4.02	9.00	4.10	28.17
47458	Analysis	4.08	8.15	4.10	27.35
	V-C Indian Brand Fertilizer—Guarantee	4.00	12.00	4.00	31.60
47072	Analysis	4.28	12.28	4.59	33.49
47177	Analysis	3.77	11.03	4.12	29.83
47220	Analysis	4.34	12.23	4.22	33.21
47314	Analysis	4.36	12.23	4.52	33.60
47386	Analysis	4.26	12.40	4.59	33.56
47459	Analysis	4.29	12.31	4.38	33.32
	V-C 18% Phospho Tobacco Brand Superphosphate—Guar.		18.00		21.60
47494	Analysis		19.90		23.88
	V-C Prolific Cotton Grower—Guarantee	3.00	10.00	3.00	24.90
47138	Analysis	3.21	10.02	3.14	25.74
47176	Analysis	3.06	9.84	3.36	25.30
47312	Analysis	3.29	10.40	3.51	26.87
47387	Analysis	3.31	10.36	3.31	26.66
47414	Analysis	3.05	10.84	3.54	26.66
	V-C Special 4-10-0 Fertilizer—Guarantee	4.00	10.00		24.80
47057	Analysis	3.74	10.59		24.68
	V-C Stonewall High Grade Guano—Guarantee	3.00	10.00	8.00	30.40
46985	Analysis	3.22	10.71	7.41	31.30
47311	Analysis	3.29	10.05	7.78	31.15

Table 8. Analysis of commercial fertilizer, season 1931-32—(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, Louisiana.—Continued.—				
47159	V-C Super 25 Fertilizer—Guarantee	5.00	15.00	5.00	39.50
	Analysis	4.86	13.99	5.54	38.43
46986	V-C 18% Superphosphate—Guarantee	—	18.00	—	21.60
47160	Analysis	—	20.47	—	24.56
47310	Analysis	—	18.20	—	21.84
	V-C 20% Superphosphate—Guarantee	—	18.77	—	22.52
47200	Analysis	—	20.00	—	24.00
47316	Analysis	—	20.53	—	24.64
	V-C Trucker's Special—Guarantee	—	20.31	—	24.37
47137	Analysis	4.00	8.00	6.00	29.00
47315	Analysis	4.27	8.44	5.75	30.12
		3.97	8.32	6.18	29.48