

Inspection and Analysis Of Commercial Fertilizers

B. D. CLOANINGER



SOUTH CAROLINA
AGRICULTURAL EXPERIMENT STATION
OF

CLEMSON AGRICULTURE COLLEGE

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 **On Leave.

BULLETIN
INSPECTION AND ANALYSIS
OF
COMMERCIAL FERTILIZERS

Season 1947-1948

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In addition to the analytical findings of the 5,122 official fertilizers samples drawn for analysis by ten inspectors, the bulletin contains the following: (1) summary of activities of the department for the fiscal year; (2) relative commercial values; (3) tonnage report for the fiscal year 1947-1948; (4) approved ratios and minimum analyses for 1949; (5) fertilizer data pertaining to usage; (6) a report of the fertilizer tour conducted at the Pee Dee Experiment Station, Florence, S. C. for fertilizer manufacturers, dealers and salesmen; (7) fertilizer recommendations for various crops; and (8) deficiency symptoms.

Samples have been secured from all fertilizer manufacturers in South Carolina and, as far as possible, in proportion to the tonnage of fertilizer materials sold. Each sample secured represents 12.5 tons. Of all fertilizer materials sold 7.3 percent was sampled by an official inspector, the greater portion of which was drawn from fertilizer located on the farm. The securing of large numbers of samples from all sections of the state, along with rigid enforcement of the fertilizer laws not only protects the farmer but the manufacturers. In order to render a prompt, efficient service to farmers, a list of inspectors, addresses, telephone numbers and territory worked is furnished all agricultural workers in the state, asking them to request the services of an inspector

when needed. In taking an official sample, a core is removed from top to bottom of the bag by means of a double tube sampling rod. Cores are taken from not less than 10 percent of the bags present unless this process necessitates cores from more than 20 bags, in which case a core is taken from one bag for each additional ton represented. If less than 100 bags, a sample is secured from not less than 10 bags; if less than 10 bags, all bags are sampled. Five unopened bags of fertilizer or fertilizer materials is the smallest amount from which an official sample can be drawn for analysis.

The Department of Fertilizer Inspection and Analysis of The Clemson Agricultural College is charged with the enforcement of the South Carolina fertilizer law. All fertilizer manufacturers, prior to selling or offering for sale any fertilizer or fertilizer material in the state are required to register their products with the department. In addition to securing official samples for analysis to see that the guarantees are met, the department inspects for tags, proper bag branding, and weights of fertilizers. It also makes analyses of unexploited sources of water and minerals and parts of human bodies where poisons are suspected as the cause of death.

Since the department functions as a unit of the South Carolina Experiment Station, it keeps in close touch with the findings of the station, and especially those pertaining to fertilizer and fertilizer materials. This permits the experiment station facts and findings to be incorporated in the approved ratios and minimum analyses grade list for fertilizer manufacturers, thereby reducing to a minimum any lapse of time in utilizing this information. The department co-ordinates and co-operates with all other agricultural agencies in striving for a better and more efficient fertilizer program. As a result of a concerted and co-ordinated program with the fertilizer industry and agricultural agencies, the number of fertilizer grades have been reduced from 222 in 1938 to 33 in 1948; six of the 33 grades constituted 93 percent of all sales. The average analysis has changed from approximately 3-8-3 (14 units) in 1938 to a 4-10-6 (20 units) in 1948. This definitely represents progress. It is generally agreed that two distinct factors are involved in reducing the cost per unit of fertilizer. First, increasing the analysis; and second, reducing the number of grades. If six grades represent 93 percent of the tonnage of mixed fertilizer, why manufacture 27 other grades representing only 7 percent? Schedule IV shows the complete reduction.

During the year several trips were made by members of the staff of this department and the college to Washington in an effort to get allocations of solid nitrogen for South Carolina increased. On May 11, 1948, a hearing attended by 85 persons from three states, was arranged before a Sub-Committee of the House of Representatives Committee on Agriculture, and a concerted effort was made to keep Congress from increasing the

allocation of solid nitrogen for overseas shipments. Those attending from South Carolina included the director of the South Carolina Experiment Station; the master of the South Carolina Grange; the president of the South Carolina Farm Bureau; and the head of the Department of Fertilizer Inspection and Analysis.

Below is a brief summary of the activities of the department.

Fertilizer tonnage for 1947-48	987,259.5
Number of samples secured and analyzed	5,122
Number of samples deficient and excessive in chlorine:	
Nitrogen	26
Phosphoric acid	57
Potash	61
Excessive Chlorine	17
Total number of samples deficient	161
Percent of deficient samples	3.14
Refund to farmers on account of deficiencies	\$6,345.89
Number of toxicological examinations	14
Number of samples of water analyzed	22
Number of bags fertilizer underweight, dealers' warehouses, seized	7,169
Average underweight per bag in pounds	3.1
Number of bags seized other than underweight	3,335
Number of bags found underweight on farms	2,153
Average underweight per bag, pounds	3.2
Number tons refunded farmers account of shortweight	12

When a fertilizer is found by analysis to be deficient beyond the limits allowed under the law, the farmer is entitled to a refund from the manufacturer of three times the commercial value of the entire deficiency in the case of nitrogen and four times the commercial value of the entire deficiency in the case of phosphoric acid and potash. The penalty due to excessive chlorine in tobacco fertilizer is 10 percent of the selling price of the lot of fertilizer when the excess is greater than 25 percent of the guarantee; 20 percent of the selling price when the excess is greater than 50 percent of the guarantee; and 50 percent of the selling price when the excess is greater than 100 percent of the guarantee.

In order to convey a quick and accurate picture, two general groups of all samples by brand and grade have been made, showing

the following results; first, the averages of all analyses of nitrogen, phosphoric acid, and potash meeting the requirements; second, the average of all analyses not meeting the requirements (those which were deficient.) Samples deficient in water-insoluble nitrogen are indicated by an asterisk. Companies having samples excessive in chlorine are indicated in Table 7.

Schedule I shows the commercial values which were used in calculating the payment to the farmers when the analysis indicated a shortage of plant food. These values represent the average of cash values at the ports, as reported by the manufacturers on January 1, 1948. They do not include the price of bagging, handling, and freight. These values are not intended to represent the selling price of fertilizers. They were used only to calculate the payments which were to be made to the farmer when a deficiency was found in analysis.

Schedule No. I.—Relative Commercial Values for 1948.

MATERIALS	Per Unit
Ammonium Nitrate Compounds—20.5	\$ 2.13
Cottonseed Meal	14.64
Cyanamid	2.73
Fish Scrap	12.00
Nitrate of Soda	2.94
Soybean Meal	14.31
Sulphate of Ammonia	2.58
Tankage	10.00
Manure Salts	1.00
Muriate of Potash75
Sulphate of Potash	1.23
Sul. Pot. Magnesia	1.64
Superphosphate	1.00
MIXED GOODS	
Water Soluble Nitrogen	1.00
Water Insoluble Nitrogen	1.00
Available Phosphoric Acid	1.00
Available Potash	1.00

ANALYSIS OF COMMERCIAL FERTILIZERS

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Schedule II. Tonnage Report for fiscal year 1947-1948.

Grade	July-December 1947	January-June 1948	Total tons	Percent of total
0-10-20		63.4	63.4	.01
0-12-12	2,235.7	758.0	2,993.7	.44
0-14-7	1,016.8	728.4	1,745.2	.25
0-15-15	117.5		117.5	.02
3-9-6	11,796.6	54,201.3	65,997.9	9.70
3-9-9	10,217.2	32,573.6	42,790.8	6.29
3-9-12	35.9	34.0	69.9	.10
3-12-3	13,340.5	32,333.4	45,673.9	6.71
3-12-9		165.1	165.1	.02
3-12-12	40.0	46.0	86.0	.01
4-8-6		156.0	156.0	.02
4-8-8	3,770.9	22,576.2	26,347.1	3.87
4-8-12	19.7	11.0	30.7	.004
4-10-6	66,467.0	292,269.5	358,736.5	52.73
4-12-4	1,741.6	6,883.7	8,625.3	1.27
4-12-8	136.0	69.3	205.3	.03
4-12-12		132.3	132.3	.02
4-16-0	46.4	46.9	93.3	.01
5-5-20		67.8	67.8	.01
5-10-5	18,836.8	73,319.0	92,155.8	13.55
5-10-10	320.3	1,264.1	1,584.4	.23
6-8-6	2,279.2	17,093.2	19,372.4	2.85
6-8-8	170.1	114.0	284.1	.04
6-9-3	2,467.7	1,481.6	3,949.3	.58
6-9-6		138.0	138.0	.02
6-10-4		6.0	6.0	.0009
6-14-0	16.1	13.5	29.6	.004
7-7-7	64.2	1,488.8	1,553.0	.22
8-8-8	23.0	3,416.6	3,439.6	.50
8-12-0	215.8	429.7	645.5	.09
10-10-0	246.8	2,010.0	2,256.8	.29
10-10-10		649.0	649.0	.09
14-0-14	3.0	189.4	192.4	.03
	135,624.0	544,728.8	680,353.6	100.0 %

Material	July-December 1947	January-June 1948	Total Tons
Ammono Nit. Compound—20.5%.....	6,275.3	19,588.9	25,864.2
Ammono Nitrate 32.5%—33.5%.....	679.3	1,784.4	2,463.7
Cottonseed Meal.....	2.5	299.2	301.7
Cyanamid.....	849.1	275.0	1,124.1
Flour Bone Meal.....	7.0	23.0	30.0
Nitrate of Soda.....	18,253.7	81,298.9	99,552.6
Shrimp and Cow Manure.....	85.8	78.7	164.5
Sulphate of Ammonia.....	2,631.6	3,064.9	5,696.5
Package.....		5.0	5.0
Perlite & Lime.....		156.6	156.6
Urea Fertz. Compound.....	29.5	65.7	97.2
Basic Slag.....	2,870.0	3,150.0	6,020.0
Landplaster.....	390.3	4,382.1	4,772.4
Colloidal Phosphate.....	250.0	180.0	430.0

Superphosphate—18%	28,686.9	4,503.2	33,190.1
Superphosphate—19%	609.8	2,079.0	2,688.8
Superphosphate—20%	2,005.6	568.4	2,574.0
Manure Salts 20—30%	1,147.1	6,661.4	7,808.5
Muriate of Potash—50%—60%	864.3	5,509.8	6,374.1
Sul-Pot-Magnesia	89.7	611.0	700.7
Sulphate of Potash	43.7	518.3	562.0
Fish & Steam Meal	39.8		39.8
	65,811.0	134,803.5	200,614.5
Total of mixed fertilizers		680,353.6	
Total of materials		200,614.5	
		880,968.1	

Schedule III.—Fertilizer Ratios and Minimum Analyses Approved for 1949.

No.	Ratios	Minimum analysis	Total units
1	1-3-2	3-9-6	18*
2	2-4-3	4-8-6	18*
3	2-3-1	6-9-3	18*
4	1-3-3	3-9-9	21
5	1-3-4	3-9-12	24
6	1-4-2	3-12-6	21
7	1-4-3	3-12-9	24
8	1-4-4	3-12-12	27
9	1-3-1	4-12-4	20
10	1-3-2	4-12-8	24
11	1-3-3	4-12-12	28
12	2-5-3	4-10-6	20
13	1-2-2	4-8-8	20
14	1-2-3	4-8-12	24
15	1-2-1	5-10-5	20
16	1-2-2	5-10-10	25
17	1-1-4	5-5-20	30
18	3-5-2	6-10-4	20
19	3-4-3	6-8-6	20
20	3-4-4	6-8-8	22
21	2-3-2	6-9-6	21
22	1-1-1	7-7-7	21
23	1-4-0	4-16-0**	20
24	1-0-1	14-0-14	28
25	0-2-1	0-14-7	21
26	0-1-1	0-12-12	24
27	0-1-2	0-10-20	30

*This grade must contain 25 percent or more of the nitrogen in water-insoluble form. Several ratios are duplicated in this list on the basis that the lower grades in the lower nitrogen ratios may contain as much as 25 percent or more of water-insoluble nitrogen.

**or higher Nitrogen

Farmers or customers mixtures must conform to the above.

Schedule IV.—Fertilizer Grade Data for South Carolina as compiled from grade tonnage reports.

Fiscal Year	Grades Reported	Total % tonnage (6 grades)	Six leading grades in order of amount used.					
1939-40	201	71.2	3-8-5	4-8-4	3-10-3	5-7-5	4-8-6	4-7-5
1940-41	200	62.0	3-8-5	4-8-4	5-7-5	4-7-5	3-10-3	2-10-4
1941-42	156	68.4	3-8-5	4-8-4	5-7-5	4-8-6	4-7-5	4-10-6
1942-43	66	85.5	3-9-6	2-12-6	4-8-6	3-8-5	4-8-4	4-8-8
1943-44	24	89.7	3-9-6	4-10-6	5-10-5	4-10-4	3-9-9	2-12-6
1944-45	21	91.6	4-10-6	3-9-9	3-9-6	5-10-5	4-8-8	3-12-6
1945-46	30	94.1	4-10-6	3-9-9	3-9-6	5-10-5	3-12-6	4-8-8
1946-47	30	89.8	4-10-6	5-10-5	3-9-6	3-9-9	3-12-6	4-12-4
1947-48	33	92.8	4-10-6	5-10-5	3-9-6	3-12-6	3-9-9	4-8-8

Below are listed the average analyses by year, for a three year period as compiled from tonnage reports submitted by the fertilizer manufacturers selling in South Carolina.

Year	Nitrogen	Ava. Phos. Acid	Potash
1944-45	3.8171%	9.6354%	6.6501%
1945-46	3.7956%	9.7072%	6.5358%
1946-47	3.9551%	9.8602%	6.1271%
1947-48	4.0106%	9.8599%	6.1088%

Schedule V.—Data on fertilizer tonnage, on number of samples secured, analyzed, and percentage found deficient from 1905 through June 1948.

Year	No. tons fertilizer sold	No. samples drawn	Deficient in one or more ingredients	% Deficient	Year	No. tons fertilizer sold	No. samples drawn	Deficient in one or more ingredients	% Deficient
1905	521,758.2	522	165	31.61	1927	722,115.6	1348	441	32.72
1906	669,033.6	655	201	30.69	1928	793,337.4	1525	584	38.30
1907	603,939.2	743	153	20.59	1929	775,177.0	1307	367	28.08
1908	688,939.0	713	161	22.58	1930	734,232.2	1356	336	24.78
1909	810,965.2	805	197	24.47	1931	602,228.8	1057	271	25.64
1910	960,395.8	1188	235	19.78	1932	455,048.8	961	252	26.22
1911	1,020,329.9	1605	393	24.49	1933	547,459.9	1226	343	27.98
1912	887,998.3	1689	380	22.50	1934	586,021.9	1037	94	9.06
1913	961,793.7	1922	389	20.24	1935	613,620.8	1283	61	4.75
1914	1,064,256.4	2537	534	21.05	1936	614,673.9	1544	136	8.81
1915	889,961.4	1227	333	27.14	1937	776,912.2	1651	124	7.51
1916	725,324.4	1598	378	23.65	1938	666,853.2	4318	279	6.46
1917	875,163.5	1594	477	29.92	1939	677,950.7	4980	376	7.55
1918	1,028,597.1	1474	438	29.72	1940	682,672.5	5026	226	4.50
1919	1,073,325.9	1301	362	27.82	1941	713,270.9	5446	324	5.95
1920	1,106,941.2	1668	519	31.12	1942	658,776.2	4939	266	5.39
1921	602,081.7	763	229	30.01	1943	802,578.5	4450	295	6.63
1922	527,954.2	722	230	31.86	1944	813,774.4	3880	242	6.24
1923	693,040.1	1181	360	30.48	1945	837,271.6	3574	324	9.07
1924	659,196.4	1272	366	28.77	1946	839,292.2	4456	456	10.23
1925	872,019.2	1239	368	29.70	1947	894,345.0	5314	243	4.65
1926	846,779.9	1327	362	27.28	1948	987,259.5	5122	161	3.14

**Schedule VI. — Summary of Fertilizer and Fertilizer Materials Sold by
Fiscal Years 1939-40 through 1947-48 as Reported by Fertilizer
Manufacturers.**

Fiscal Years	Mixed Fertilizers	Materials	Total
1939-40	392,958.1	269,961.4	662,919.5
1940-41	425,461.9	242,554.1	668,016.0
*1941-42	467,566.2	122,088.7	589,654.9
1942-43	525,211.4	272,776.2	797,987.6
1943-44	545,563.4	180,944.9	726,508.3
1944-45	545,296.1	222,380.7	767,676.8
1945-46	596,133.4	208,872.8	805,006.2
1946-47	704,653.4	153,739.8	858,393.2
1947-48	680,353.6	200,614.5	880,968.1

* Reports incomplete.

SOUTH CAROLINA FERTILIZER MEETING PEE DEE EXPERIMENT STATION.

A better understanding of the problems of crop production should result from meetings of representatives of the fertilizer and insecticide industries with research and extension workers, especially when the group can study field results of the combined use of their products. This statement by J. T. Lazar, Clemson extension district agent for the Florence District, was exemplified at the annual meeting of the representatives of the fertilizer industry, various agricultural agencies, commercial insecticide manufacturers, and others interested in crop production held at the Pee Dee Experiment Station at Florence, July 14th.

Invitations to the meeting extended by Dr. H. P. Cooper, director and B. D. Cloaninger, head, Department of Fertilizer Inspection and Analysis, both of the South Carolina Experiment Station of Clemson College were accepted by about 300 from six states and from Washington, D. C. The visitors represented not only fertilizer manufacturers, dealers, and salesmen doing business in South Carolina, but also represented various branches of the U. S. Department of Agriculture, Clemson College Extension Service, South Carolina Experiment Station, Soil Conservation Service, Farmers Home Administration, seed companies, cotton oil companies American Potash Institute, National Fertilizer Association, American Plant Food Council, vocational agricultural teachers, bankers, railroads, and other groups and agencies. E. E. Hall, superintendent of the Pee Dee Station, and his staff cooperated with Director Cooper and Mr. Cloaninger in completing local arrangements.

Through the cooperation of a number of fertilizer manufacturers in the Pee Dee section, trucks were available, and the visitors were divided into groups to see the experimental results in the various combinations of fertilizer materials, cultural practices, insect and disease control on the experiment station farms. The groups were conducted by Dr. Cooper, E. E. Hall, J. F. Bullock, and Norman Allen of the Experiment Station staff. Experimental work on cotton, corn, tobacco, and other crops was studied.

The group was impressed not only with the general excellence of the crops but also with the apparent effectiveness of the new insecticides in weevil control. Progress in increasing corn yields by the development of new hybrids, proper fertilization, and good cultural methods were also noted.

Principal speakers at the luncheon meeting at the noon hour were Dr. Cooper, Mr. Lazar, Mr. Cloaninger, and A. D. Kincaid, Southern Cotton Oil Company, Columbia, who responded for the fertilizer industry to the welcome extended them.

Dr. Cooper stressed the responsibility of both fertilizer and insecticides manufacturers in crop production. He pointed out that the work of one man in a fertilizer factory is equal to the work of 30 men on the farm in crop production. He also cautioned



FERTILIZER MANUFACTURERS, DEALERS, SALESMEN AND OTHERS ATTENDING
TOUR AT PEE DEE EXPERIMENT STATION, FLORENCE, S. C.



DR. H. P. COOPER, DIRECTOR, S. C. EXPERIMENT STATIONS EXPLAINS
COTTON FERTILIZATION EXPERIMENTS AT PEE DEE
EXPERIMENT STATION

that the use of fertilizer is a loss unless the weevils are controlled. He complimented Superintendent Hall and members of the Pee Dee Station staff upon their successful efforts to control weevils on the experiment Station Farms.

Mr. Lazar welcomed the visitors to Florence and pointed out that increased yields and better methods of crop production will result through cooperation of the groups represented at the meeting.

Mr. Cloaninger complimented the fertilizer manufacturers for their co-operation in recent years in helping to make possible a reduction in the number of fertilizer formulas from over 200 a few years ago to about 33 at the present time. He pointed out that of the approximately 33 grades on the market last year almost 93 percent of the fertilizers sold were of only six grades.

Floyd F. Bondy, USDA entomologist at the Pee Dee Station, by the use of charts presented a brief summary report of boll weevil control results at the station from the use of new insecticides in 1947.

In the afternoon the group visited the Pedigreed Seed Farms at Hartsville where the importance of the use of certified cotton and corn seed was stressed. The necessity for planting only wilt-



J. F. BULLOCK, AGRONOMIST, PEE DEE EXPERIMENT STATION
EXPLAINS TOBACCO EXPERIMENTS ON STATION FARM

resistant cotton varieties was also made evident. The day's activities were brought to a most delightful end by an old-time watermelon cutting with Dr. George Wilds and Robert Coker of the Pedigreed Seed Company supplying an abundance of the famous Coker watermelons for the occasion.

Among the out-of-state visitors at the meeting and the organizations they represented were: E. Y. Floyd, Raleigh, N. C., Plant Food Institute of North Carolina and Virginia; Dr. M. H. McVickar, Washington, D. C., National Fertilizer Association; Dr. S. F. Thornton, Norfolk, Va., Royster Guano Company; Dr. John R. Taylor, Washington, D. C., The American Plant Food Council; Frank E. Boyd, Montgomery, Ala., V-C Chemical Corporation; J. E. Bussart, Wheaton, Ill., Velsical Corporation; and J. M. Gibson, Atlanta, Ga., Cotton Products Association.

Also E. M. Hansen, Raleigh, N. C., Solvay Products Division, Allied Chemical and Dye Corporation; J. F. Kimball, Birmingham, Ala., T. C. I. and R. R. Company; H. B. Mann, Washington, D. C. American Potash Institute; and George W. Suggs, Atlanta, Ga. The Barrett Division, Allied Chemical and Dye Corporation. Many other commercial representatives were present, together with other agricultural leaders.

SPECIAL CROP RECOMMENDATIONS***COTTON**

	Grade	Rate		Condition
		Pounds per acre		
1.	3-12-6	400-800		Following good legume crop on heavier soils
2.	3-9-9 or 4-12-12	400-800		Following good legume crop on lighter soils
3.	3-9-9	400-800		Following good legume hay crop on Idrell, or similar soils low in available potash
4.	4-12-4	400-600		On poorer types of heavier soils
5.	4-10-6	400-600		On poorer types of lighter soils
6.	4-8-8 or 5-10-10	400-1000		On average types of lighter soils low in available potash
7.	5-10-5	400-1000		On average types of heavier soils
8.	6-8-6 or 7-7-7	400-1000		On productive soils where high yields can be expected
9.	0-14-7	400-800		Heavier soils following good winter legume green manure crop.
10.	0-12-12	400-800		Lighter soils following good winter legume green manure crop
11.	0-20-0	500-1000		On relatively new land in combination with good farm manure
12.	Side-dress with 150 to 250 pounds nitrate of soda (or equivalent)			

TOBACCO

	Grade	Rate		Condition
		Pounds per acre		
1.	3-9-6	800-1200		Average soil conditions
2.	3-9-9 or 3-9-12	800-1000		For high quality tobacco
3.	6-9-3	1 lb. sq. yd.		For plantbeds
4.	5-5-20	200 lbs. or more		for side dressing or
5.	Side dress with 100-200 lbs. sulphate of potash (or equivalent) where extra potash is desired.			

CORN, SORGHUM, MILLET, ANNUAL GRAZING

	Grade	Rate		Condition
		Pounds per acre		
1.	3-9-9 or 4-12-12	300-600		Lighter soils
2.	4-12-4	300-600		Heavier soils
3.	0-12-12	300-600		Lighter soils following good legume crop
4.	0-14-7	300-600		Heavier soils following good legume crop
5.	Side-dress with 150-250 pounds nitrate of soda (or equivalent)			

SMALL GRAIN

	Grade	Rate		Condition
		Pounds per acre		
1.	3-12-6	300-600		Better soils
2.	4-12-4	300-600		Average soils
3.	0-12-12	400-600		Lighter soils, following good legume crop
4.	0-14-7	400-600		Heavier soils, following good legume crop
5.	Top-dress with 200 to 300 pounds of nitrate of soda (or equivalent)			

PEANUTS

	Grade	Rate Pounds per acre	Condition
1.	3-12-6	400-800	Average soils low in nitrogen
2.	0-12-12	400-800	Better soils

PERMANENT PASTURES

	Grade	Rate Pounds per acre	Condition
1.	3-12-12	400-800	Establishing on average soils and as annual top-dressing on less fertile soils
2.	4-12-4 or 5-10-5	400-800	Establishing on less fertile soils
3.	0-12-12	400-800	Top-dressing on established and improved pastures on lighter soils
4.	0-14-7	400-800	Top-dressing on established and improved pastures on heavier soils
5.	0-20-0	400-800	In combination with ample farm manure

* Clemson Agric. College Extension Circ. 283, 1946



PROPER FERTILIZATION, FIRM SEED BED, GOOD SEED AND HIGH ANALYSIS FERTILIZER MAKE FOR PROFITABLE RETURNS FROM SMALL GRAINS

LEGUMES

	Grade	Rate Pounds per acre	Condition
1.	3-12-6	200-500	Average soils
2.	4-12-4	200-500	Less productive soils
3.	0-12-12	200-500	Productive lighter soils
4.	0-14-7	200-500	Productive heavier soils
5.	0-20-0	200-500	New land

TRUCK CROP FERTILIZER RECOMMENDATIONS **

Crop	Analyses	Pounds per acre	Side dressing lbs. of N. per Acre
Asparagus	5-10-5	2000 ($\frac{1}{2}$ before cutting), ($\frac{1}{2}$ after cutting)	
Beets	5-10-5 or 6-9-6	1200-1500	30-45
Carrots	5-10-5 or 6-9-6	1200-1500	30-45
Lettuce	5-10-5 or 6-9-6	1200-1500	
Beans, snap	4-12-4, 5-10-5		
Beans, Lima	or 4-16-0***	700-1000	
Cantaloupe	5-10-5 or 4-8-6	800-1000	
Cucumber	5-10-5 or 4-8-6	800-1000	
Watermelon	5-10-5 or 4-8-6	600-800	
Broccoli	5-10-5 or 6-9-6	1200-1500	30-45
Collards, Kale etc.	5-10-5 or 6-9-6	1200-1500	30-45
Rutabaga	5-10-5 or 6-9-6	1200-1500	30-45
Cabbage	5-10-5 or 6-9-6	2000-	30-60
Cauliflower	5-10-5 or 6-9-6	2000-3000	45-60
Spinach	5-10-5 or 6-9-6	1500-2000	30-45
Turnips, Mustard etc.	5-10-5 or 6-9-6	500-1000	25-30
Potato, Irish	5-10-5 or 6-9-6	2000-	
Potato, Sweet	3-9-9	800-1000 ($\frac{1}{2}$ before setting) ($\frac{1}{2}$ -30 days after setting)	
Tomato	5-10-5 or 6-9-6	1000-1500	
Pepper & Paprika	5-10-5 or 6-9-6	800-1200	25-30
Okra	5-10-5 or 6-9-6	800-1200	25-30
Onions	5-10-5 or 6-9-6	1200-1600	25-30
Sweet Corn	5-10-5 or 6-9-6	600-800	25-30

**South Carolina Experiment Station.

***Use on Coastal vegetable soils where beans are grown immediately following a heavily fertilized crop such as potatoes, cabbage or tomatoes.

MAGNESIUM DEFICIENCY IN COTTON



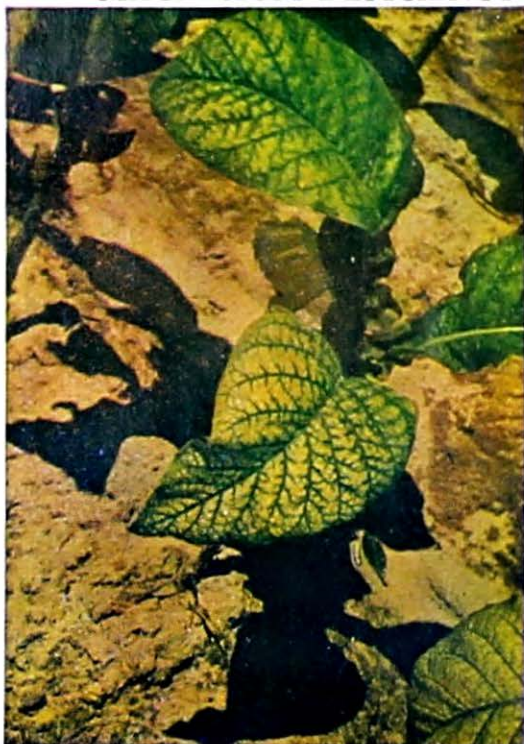
A field of cotton in an advanced stage of magnesium deficiency.

The symptoms of the disease appear first on the lower leaves which turn dull red with pale green mid-rib and veins.



(Photographs Courtesy of Chilean Nitrate Educational Bureau, Inc.)

MAGNESIUM DEFICIENCY IN TOBACCO



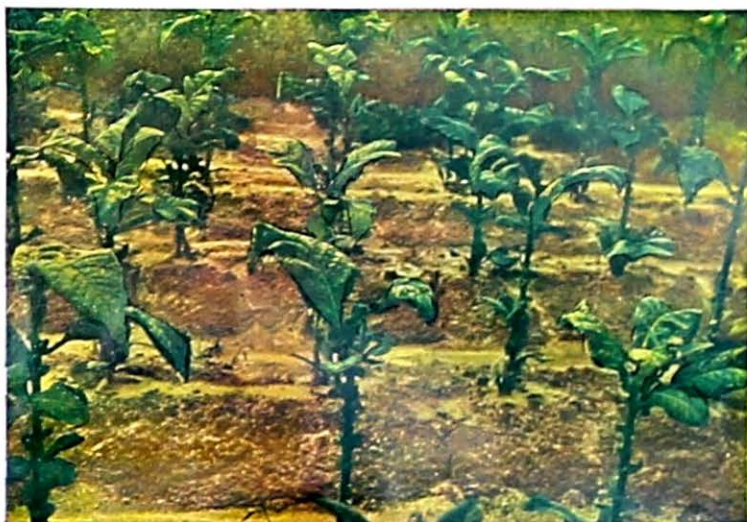
"Sand Drown"

The leaves gradually turn yellow, remaining green along the veins until the entire leaf loses its normal color.

BORON DEFICIENCY IN TOBACCO

(Below)

Part of a field of plants showing characteristic symptoms of boron deficiency.



(Photographs Courtesy of Chil. Nitrate Educational Bureau, Inc.)

**Approximate Optimum pH Range for the Growth of Various Crops under the
Common Conditions existing in South Carolina Soils** *

Crop		Crop	
Alfalfa	6.5 to 7.5	Millet	5.5 to 6.5
Alsike clover	6.0 to 7.0	Oats	5.5 to 6.5
Asparagus	6.0 to 6.5	Onions	6.0 to 6.5
Austrian peas	6.0 to 6.5	Peaches	5.5 to 6.0
Barley	5.5 to 6.5	Peanuts	6.0 to 6.5
Bermuda grass	5.5 to 6.5	Peppers	5.5 to 6.5
Blue grass	6.0 to 7.0	Potatoes	5.0 to 5.5
Beets	6.0 to 7.0	Rape	5.5 to 6.0
Cabbage	6.0 to 6.5	Rye	5.5 to 6.0
Cantaloupes	6.0 to 6.5	Snap beans	5.5 to 6.0
Carpet grass	5.0 to 6.0	Sorghum	5.5 to 6.0
Corn	5.5 to 6.5	Soybeans	5.5 to 6.5
Cotton	5.5 to 6.5	Squash	5.5 to 6.5
Cowpeas	5.5 to 6.5	Sweet clover	6.5 to 7.5
Crimson clover	6.0 to 6.5	Tobacco	5.3 to 5.5
Crotalaria	5.0 to 5.5	Tomatoes	5.5 to 6.5
Cucumber	5.5 to 6.5	Velvet beans	5.5 to 6.5
Dallas grass	6.0 to 6.5	Vetch	5.5 to 6.5
Garden peas	6.0 to 6.5	Watermelons	5.0 to 5.5
Hop clover	5.5 to 6.5	Wheat	5.5 to 6.5
Kudzu	5.5 to 6.5	White clover	6.0 to 7.0
Lespedeza	5.5 to 6.5		

* Clemson Agric. College Extension Circular 283, 1946



**PROPER APPLICATION OF HIGH ANALYSES FERTILIZERS AND
GOOD SEED IMPORTANT FOR MAXIMUM YIELDS**

TABLE 1—Nitrogen, Phosphoric Acid and Potash

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Acme Fertilizer Co., Wilmington, N. C.								
Acme Tobacco Ace.	3-9-6	29	3.07	9.33	6.41			
Acme Tobacco Fertilizer	3-9-6	1	3.09	9.15	6.06			
Acme Fertilizer	4-8-8	1	3.80	7.90	7.80			
Acme Fertilizer	4-10-6	24	4.01	10.10	6.20			
Acme Fertilizer	5-10-5	8	4.88	9.77	5.52	2	4.70	9.00
Acme Plant Bed Spec.	6-9-3	1	5.65	8.95	3.80			
Aiken Fertilizer Co., Aiken, S. C.								
Aiken's	3-9-9	1	3.60	8.85	9.92			
Aiken's	4-10-6	9	4.11	9.97	6.44			
Allendale Fertilizer Co., Allendale, S. C.								
Cotton Fertilizer	4-12-4	1	5.00	11.93	4.78			
Watermelon Fertilizer	5-10-5	1	5.30	9.95	4.77			
American Agri. Chemical Co., New York, N. Y.								
Agrico for Tobacco	3-9-6	34	2.99	9.14	6.15			
Zells High Grade Tob.	3-9-6	4	2.96	9.11	6.14			
Zells Bright Tob.	3-9-6	8	2.91	9.21	6.21			
Agrico for Sweet Pot.	3-9-9	3	3.15	9.25	8.81	2	3.13	9.75
Agrico for Corn	3-9-9	1	3.19	8.95	8.96			
Agrico for Tobacco	3-12-6	2	3.15	11.80	6.37			
Agrico for Corn	3-12-6	11	3.15	12.02	6.45			
Agrico for Cotton	3-12-6	7	3.19	12.26	6.35			
Agrico for Grain	3-12-6	19	3.09	12.07	6.30			
A. A. Quality	3-12-6	37	3.13	12.22	6.29			
Agrico for Corn	4-8-8	2	4.03	7.95	8.22			
Agrico for Cotton	4-10-6	30	3.99	10.33	6.32			
A. A. Quality	4-10-6	38	4.01	10.40	6.23	1	3.15	11.30
A. A. Quality	4-12-4	1	4.10	13.45	4.53			
Agrico for Cotton	4-12-4	4	4.14	12.26	4.29			
Agrico for Truck	5-10-5	13	4.92	10.40	5.34			
A. A. Quality	5-10-5	4	4.88	10.20	5.39			
Agrico for Fruit	6-8-6	1	5.90	8.63	6.07			
Agrico for Plant Bed	6-9-3	9	6.47	9.34	3.70			
Anderson Fertilizer Co., Anderson, S. C.								
Anderson	4-8-8	5	4.11	9.08	8.31			
Anderson	4-10-6	40	4.71	10.72	6.37			
Anderson	5-10-5	21	5.16	10.39	5.48			
Anderson	6-8-6	5	6.12	8.83	6.34			
Anderson Guano Co., Timmonsville, S. C.								
Ed Anderson's Tobacco	3-9-6	19	3.23	9.63	6.63			
Ed Anderson's	4-10-6	3	4.30	10.28	6.65			
Ed Anderson's Cotton	4-12-4	5	4.01	12.12	4.29	2	4.17	10.82
Armour Fertilizer Works, Augusta, Ga.								
Armour's Big Crop	3-9-9	2	3.07	9.03	9.22			
Armour's Big Crop	3-12-6	2	3.08	11.88	6.15			
Armour's Big Crop	4-8-8	2	3.95	8.43	7.63			
Armour's Big Crop	4-10-6	16	3.99	10.25	6.07			
Armour's Big Crop	5-10-5	3	4.85	10.27	5.04			
Armour's Big Crop	6-8-6	2	5.88	8.43	5.99			
Armour Fertilizer Works, Columbia, S. C.								
Armour's Big Crop	3-9-9	8	3.31	9.56	8.98			
Armour's Big Crop	3-12-6	1	3.35	11.95	5.70			
Armour's Big Crop	4-8-8	13	4.03	8.33	8.04			
Armour's Big Crop	4-10-6	74	4.16	10.33	6.23			
Armour's Big Crop	5-10-5	24	5.07	10.28	5.32			
Armour's Big Crop	6-8-6	20	5.97	8.64	6.19			
Armour Fertilizer Works, Wilmington, N. C.								
Armour's Light Meal Tob.	3-9-6	16	3.13	9.03	6.08	1	3.35	8.75
Armour's N. C. State Tob.	3-9-6	21	3.11	9.23	6.18			
Armour's Big Crop	3-12-6	6	3.38	12.09	6.33			
Armour's Big Crop	4-10-6	23	4.12	10.07	6.32			
Armour's Big Crop	5-10-5	9	5.16	10.42	5.51			
Armour's Big Crop	6-8-6	6	6.00	8.68	5.74			
Armour's Big Crop	6-9-3	1	5.95	9.20	3.62			
Armour's Big Crop	7-7-7	1	6.80	7.60	7.29			
Augusta Fertilizer Works, Augusta, Ga.								
Augusta	4-10-6	2	4.35	10.45	6.39			

TABLE 1—Nitrogen, Phosphoric Acid and Potash

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Augusta	5-10-5	1	5.15	10.30	5.25			
Banks Fertilizer Co., St. Matthews, S. C.		2	4.33	8.65	8.79			
Banks High Grade	4-8-8	9	4.32	10.26	6.64			
Banks High Grade	4-10-6							
Batesburg Fertilizer Co., Batesburg, S. C.		11	4.08	10.40	6.19			
Tri-County Non-Compare	4-10-6	4	5.34	10.38	5.33			
Tri-County Asparagus Sp.	5-10-5							
Bauknight, J. E., Walhalla, S. C.		2	4.05	9.88	6.57			
Bauknight's Pride	4-10-6	2	4.85	9.85	5.56			
Bauknight's Pride	5-10-5							
Blue Belt Fertilizer Co., Savannah, Ga.		1	4.10	9.90	7.10			
Blue Belt	4-10-6	1	4.60	10.00	6.60			
Blue Belt	5-10-5							
Brown Fertilizer Co., Blackville, S. C.		3	3.20	13.02	6.03			
Brown's Best	3-12-6	14	4.05	10.80	5.99	2	3.45	11.30
Brown's Best	4-10-6							
Burr Gin & Fertz. Co., Cheraw, S. C.		6	4.26	10.31	6.07			
Burr's Meal Mix	4-10-6	1	5.05	10.00	5.30			
Burr's Meal Mix	5-10-5							
Caldwell & Co., Spartanburg, S. C.		4	4.08	9.94	6.60	1	4.10	9.10
Sunrise	4-10-6							6.50
Carolina Mixing Co., Fairfax, S. C.		2	3.05	8.88	9.59			
Carolina	3-9-9	2	3.85	8.08	9.39			
Carolina	4-8-8							
Carolina	4-10-6	2	6.03	8.55	6.65	2	4.05	9.18
Carolina	6-8-6							7.19
Catawba Fertilizer Co., Lancaster, S. C.		1	2.95	9.25	9.21			
Catawba Big Chief	3-9-9	5	4.27	8.81	7.97			
Catawba Big Chief	4-8-8	20	4.17	10.05	6.31	2	4.30	10.33
Catawba Big Chief	4-10-6	1	5.25	10.50	5.11			5.13
Catawba Big Chief	5-10-5							
Chatham Fertilizer Co., Savannah, Ga.		12	4.16	10.39	6.45			
Pineland	4-10-6							
Coleman Guano Co., Pamplico, S. C.		12	3.75	8.97	7.12			
Mo-Pay Tobacco	3-9-6	9	4.33	8.04	8.54	1	4.30	8.90
General Crop	4-8-8	1	6.45	8.00	6.63			7.25
Plant Bed Special	6-8-6							
Cooper (W.C.) Fertilizer Co., St. Matthews, S. C.		1	3.15	9.40	8.64			
High Quality	3-9-9	3	3.05	12.10	6.44			
High Quality	3-12-6	9	4.08	10.02	6.73			
High Quality	4-10-6							
Cooperative Fertilizer Service, Norfolk, Va.		6	3.08	9.17	6.29			
Open Formula Tob.	3-9-6	4	3.14	11.88	6.63			
Open Formula	3-12-6							
C-W-S Guano Co., Clinton, S. C.		3	3.33	9.23	9.46			
C-W-S High Quality	3-9-9	7	4.26	8.49	8.11			
C-W-S High Quality	4-8-8	7	6.03	8.24	6.40			
C-W-S High Quality	6-8-6							
Culler (J. E.) & Co., North, S. C.		1	4.13	9.25	8.72			
Culler's Pride	3-9-9	9	3.89	9.76	6.21	2	4.15	9.13
Culler's Pride	4-10-6	2	7.90	8.40	7.87			6.94
Culler's Top Dresser	8-8-8							
Davison Chemical Corp., Savannah, Ga.		3	3.15	8.78	6.98			
Davco Ober Read Tob.	3-9-6	2	3.08	9.45	8.99			
Davco Ober Read Tob.	3-9-9	38	4.03	10.00	6.26	1	3.90	9.40
Davco Ober Read	4-10-6	15	5.07	9.89	5.43			6.67
Davco Ober Read	5-10-5	3	6.00	8.17	7.16			
Davco Pomo Food	6-8-6							
Denmark Fertilizer Co., Denmark, S. C.		1	4.20	9.70	6.60	1*	3.15	8.80
Denmark	4-10-6	1	5.15	10.20	5.49			5.98
Denmark	5-10-5							
Dew (D. M.) & Sons, Latta, S. C.		6	4.12	9.96	6.49			
Cotton Special	4-10-6							
Dixie Guano Co., Laurinburg, N. C.		5	3.37	9.39	5.96			
Tobacco Special	3-9-6	1	3.55	9.90	8.53			
Potato Special	3-9-9	1	3.20	12.45	6.55			
Dixie Fertz.	3-12-6							

*Deficient also in water insol. nitrogen.

TABLE 1—Nitrogen, Phosphoric Acid and Potash

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Int. Prem. Tob.	3-9-6	4	3.09	9.01	6.59			
Int. Prem. Producer Tob.	3-9-6	6	3.08	8.72	6.35			
Int. Spec. Tob.	3-9-6	2	2.98	9.43	6.34			
Int. Cracker Jack Tob.	3-9-6	1	2.45	8.65	6.42			
Hartsville Fertz.	3-9-6	4	3.08	9.60	6.35			
Hartsville Spec. Tob.	3-9-9	1	3.00	10.00	8.50			
Hartsville Sweet Potato	3-9-9	3	3.00	9.77	8.82	1*	3.00	9.95
Hartsville Fertz.	3-12-6	6	3.19	12.27	6.30			
International Fertz.	3-12-6	2	3.13	11.50	6.35	1	3.35	11.15
International Fertz.	4-10-6	15	4.17	10.43	6.32			
Hartsville Fertz.	4-10-6	28	4.10	10.23	6.37			
Hartsville Fertz.	5-10-5	11	5.11	10.13	5.42			
International Fertz.	5-10-5	6	5.11	10.11	5.45			
International Fertz.	6-8-6	1	5.90	8.23	6.36			
Hartsville Fertz.	6-8-6	2	5.65	8.38	6.33			
Hartsville Plant Bed	6-9-3	8	6.23	9.09	3.56	1	5.05	9.30
International Plant Bed	6-9-3	3	6.30	9.50	3.58			
Internat. Min. & Chem. Corp., Spartanbg, S. C.								
Int. Cracker Jack Tob	3-9-6	1	3.20	9.45	5.82			
International Fertz.	3-9-9	27	3.13	9.51	9.15			
International Fertz.	3-12-6	4	3.16	12.18	6.01			
International Fertz.	4-8-8	9	3.95	8.66	8.01			
International Fertz.	4-8-12	1	4.20	8.95	11.74			
International Fertz.	4-10-6	51	3.94	10.22	6.24			
International Fertz.	5-10-5	13	4.89	10.48	5.41			
International Fertz.	6-8-6	13	5.73	8.63	6.19	2	5.33	8.83
Internat. Min. & Chem. Corp. Wilmington, N. C.								
International Prem. Tob.	3-9-6	1	3.10	8.60	6.16			
International Fertz.	4-10-6	1	3.95	9.95	6.28			
International Plant Bed	6-9-3	3	6.02	9.08	3.71			
Jordan (C. M.), Angelus, S. C.								
Jordan's Tob. Grower	3-9-6	3	2.95	9.95	6.77			
Jordan's All Purpose	4-10-6	6	4.15	10.16	6.15	1	3.85	9.80
Josey Fertilizer Corp., Wilmington, N. C.								
Standard Tobacco	3-9-6	6	3.20	9.12	6.34	1	3.30	10.35
All Cream Tob.	3-9-6	30	3.09	9.20	6.31			4.21
All Cream Tob.	3-9-9	4	3.28	8.90	9.29			
Yam Special	3-9-9	5	3.13	8.95	8.84			
Josey's General Crop	4-10-6	23	4.03	9.90	6.19			
Josey's General Crop	5-10-5	2	4.85	9.68	5.50			
Josey's Top Dresser	5-5-20	1	5.00	5.25	19.62			
Josey's Cash Top Dresser	6-8-6	2	5.78	8.38	6.05			
Josey's General Crop	6-8-6	2	5.84	8.00	6.65			
Josey's Truck Spec.	6-8-6	3	5.83	7.98	6.12			
Josey's Plant Bed Spec.	6-9-3	9	5.87	9.46	3.40			
Kershaw Oil Mill, Kershaw, S. C.								
Kershaw High Quality	3-9-6	4	3.14	8.81	6.68			
Kershaw High Quality	4-8-6	2	4.18	8.05	6.10			
Kershaw High Quality	4-8-8	10	4.03	8.27	8.54	1	4.30	8.45
Kershaw High Quality	4-10-6	9	4.05	9.91	6.81			7.17
Logan-Robinson Fertilizer Co., Charleston, S. C.								
L. R. Oriental Tobacco	3-9-6	27	3.28	9.27	6.53			
L. R. Giant	3-9-9	52	3.17	9.31	9.37	4	3.19	9.43
L. R. Giant	3-12-6	16	3.23	12.42	6.66			8.23
L. R. Giant	4-8-8	2	4.08	8.48	8.58			
L. R. Giant	4-10-6	119	4.21	10.29	6.45			
L. R. Giant	5-10-5	16	5.22	12.77	5.56			
Lynchburg Fertilizer Co., Lynchburg, S. C.								
Mealo Tobacco	3-9-6	1	2.75	9.30	6.20			
Mealo Cotton	3-12-6	3	2.99	12.27	6.14			
Cotton Fertz.	4-10-6	8	4.09	10.13	6.42			
Cotton and Corn	4-12-4	2	4.58	11.78	4.70			
Manning & Shine, Latta, S. C.								
M & S Tobacco	3-9-6	9		12	7.33			
M & S Cotton and Corn	4-10-6	8		12	5.66			
M & S Top Dresser	7-7-7	2		5	9.03			

*Deficient in water insoluble nitrogen.

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	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Marion Cotton Oil Co., Marion, S. C.								
Gold Coin Tobacco..... 3-9-6	13	3.11	8.98	6.83				
Gold Coin Gen. Crop..... 3-9-9	2	3.10	8.90	9.28				
Gold Coin Gen. Crop..... 4-10-6	9	3.97	10.27	6.48	1	4.10	9.25	6.47
Gold Coin Gen. Crop..... 5-10-5	4	4.94	9.89	5.71				
Marlboro Fertilizer Co., Clio, S. C.								
Marlboro..... 4-10-6					1	3.95	10.25	5.19
Maxton Oil & Fertilizer Co., Maxton, N. C.								
MOFCO..... 4-10-6	1	4.35	10.55	6.69				
Maybank Fertilizer Corp., Charleston, S. C.								
Omar Premium Tob..... 3-9-6	31	3.16	9.24	6.17				
Maybank Fish..... 3-9-9	26	3.18	9.42	9.29				
Maybank Fish..... 3-12-6	9	3.18	12.19	6.40				
Maybank Fish..... 4-10-6	77	4.10	10.11	6.42	2	3.98	9.23	6.15
Maybank Fish..... 5-10-5	8	4.98	10.07	5.39				
McLeod's Special..... 5-10-5	3	4.92	9.97	5.40				
Omar Plant Bed..... 6-9-3	5	6.13	8.90	3.28	3	6.23	8.38	3.29
McLaurin's, Inc., Rockingham, N. C.								
Wolf Pit..... 4-10-6	3	4.50	10.75	6.33				
McLees Fertilizer Co., Anderson, S. C.								
McLees Special..... 3-9-9	2	3.13	9.35	9.99				
McLees Special..... 4-10-6	4	4.06	10.23	6.43				
Merco Company of Gaffney, Gaffney, S. C.								
Merco Special..... 3-9-12	1	3.65	10.40	11.54				
Merco Special..... 4-8-8	4	4.49	8.58	7.80	3	4.33	8.50	6.65
Merco Special..... 4-10-6	9	4.03	9.87	6.49	1	4.15	9.35	6.76
Merco Special..... 6-8-6	1	6.00	8.05	6.91				
Miller Brothers Co., Jefferson, S. C.								
Miller's All Crop..... 3-9-6	11	3.29	9.40	6.76				
Miller's Meal Mix..... 3-9-6	1	3.45	8.85	6.36				
Miller's All Crop..... 4-8-8	1	4.45	9.60	7.90				
Miller's Peach Special..... 4-8-8	1	3.85	9.00	8.15				
Miller's All Crop..... 5-10-5	2	4.98	10.15	5.54				
Molony Fertilizer Co., Charleston, S. C.								
Special Tobacco..... 3-9-6	5	3.22	9.05	6.39				
Field Crop..... 3-12-6	1	3.30	11.75	5.81				
Field Crop..... 4-10-6	8	4.11	10.26	6.16				
Truck Mixture..... 5-10-5	10	4.92	10.42	5.13				
Field Crop..... 5-10-10	1	5.25	10.50	10.16				
Truck Mixture..... 6-8-6	2	5.85	8.28	6.20				
Morris Fertilizer Co., Wilmington, N. C.								
Light Meal Tobacco..... 3-9-6	3	3.09	9.03	6.08				
N. C. State Tobacco..... 3-9-6	8	3.19	9.23	6.26				
Gold Bond..... 4-10-6	4	4.20	10.08	6.47	1	3.10	9.60	8.60
Gold Bond..... 5-10-5	6	5.07	9.93	5.49				
Plant Bed..... 6-9-3	2	5.93	9.45	3.35				
Mutual Fertilizer Co., Savannah, Ga.								
Mutual Tobacco..... 3-9-6	2	3.18	9.43	6.15				
Mutual Sweet Potatoes..... 3-9-9	1	3.25	9.50	9.53				
Mutual..... 3-9-9	7	3.09	9.36	9.15				
Mutual..... 3-12-6	6	3.50	12.32	6.47				
Mutual..... 4-8-8	2	3.98	8.18	8.60				
Mutual..... 4-10-6	60	4.14	10.05	6.33				
Mutual..... 5-10-5	10	4.85	10.09	5.49				
Naco Fertilizer Company, Charleston, S. C.								
Seabird Tob. Grower..... 3-9-6	4	3.28	9.26	6.40				
Caravan Tob. Special..... 3-9-6	8	3.14	9.38	6.21				
P & M Tob Mixture..... 3-9-6	15	3.18	9.59	6.25				
Peacock Tob. Special..... 3-9-6					1	3.05	8.00	5.95
Seabird Crop Grower..... 3-9-9	16	3.45	9.07	9.17				
Seabird Crop Grower..... 3-12-6	12	3.33	11.84	6.14	1	3.45	12.90	5.01
Seabird Crop Grower..... 3-12-12	1	4.00	11.55	12.10				
Seabird Crop Grower..... 4-8-8	6	3.98	8.17	9.17				
Seabird Crop Grower..... 4-10-6	86	4.19	10.09	6.38	1	4.25	9.40	6.54
Seabird Crop Grower..... 4-12-4	1	4.25	11.90	4.00				
Seabird Crop Grower..... 5-10-5	15	5.02	10.06	5.36				
Seabird Truck Grower..... 5-10-5	24	4.99	10.28	5.56				
Seabird Crop Grower..... 5-10-5	9	5.83	8.27	6.32				
Redbird Plant Grower..... 5-10-5	3	6.00	9.88	3.23				

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	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Seabird Top Dresser..... 8-8-8	1	7.85	8.05	7.95				
Naco Fertilizer Co., Spartanburg, S. C.								
Seabird Crop Grower..... 3-9-9	5	3.29	9.56	9.42				
Seabird Crop Grower..... 4-8-8	2	4.13	7.98	8.06				
Seabird Crop Grower..... 4-10-6	13	4.28	9.77	6.47	2	4.20	9.28	7.25
Seabird Crop Grower..... 5-10-5	1	5.10	9.60	5.20	1	5.10	9.30	5.38
Naco Fertilizer Co., Wilmington, N. C.								
Caravan Tob. Grower..... 3-9-6	9	3.09	9.27	6.29				
P & M Tobacco Mix..... 3-9-6	11	3.08	9.29	6.22				
Double Eagle Tob..... 3-9-6	2	3.18	9.65	6.08				
Seabird Tob. Grower..... 3-9-6	2	3.15	9.40	5.77				
Caravan Tob. Spec..... 3-9-9	4	3.10	9.69	8.88				
P. & M. Tob. Mix..... 3-9-9	1	3.15	9.25	8.56				
Peacock Tob. Spec..... 3-9-9	1	3.05	9.05	8.95				
Sweet Potato Spec..... 3-9-9	1	3.05	9.30	8.92				
Seabird Crop Grower..... 4-10-6	16	4.01	10.19	6.27				
Seabird Crop Grower..... 5-10-5	5	5.06	10.12	5.27				
Redbird Plant Bed..... 6-9-3	5	5.96	9.33	3.65				
Nimmons (W. P.) & Co., Seneca, S. C.								
Nimmons..... 3-12-6	1	3.40	12.65	7.76				
Nimmons..... 4-10-6	6	4.41	11.10	6.64				
Nimmons..... 5-10-5	2	5.43	10.33	6.29				
Nimmons..... 5-10-10	4	5.28	10.44	10.91				
Nimmons..... 6-8-6	1	6.35	9.20	6.78				
Pendleton Oil Mill, Pendleton, S. C.								
Pendleton..... 4-10-6	9	4.30	10.11	6.53				
Piedmont Fertilizer Corp., Greenwood, S. C.								
Piedmont..... 3-9-9	16	3.22	9.49	8.99	1	3.10	9.60	7.88
Piedmont..... 3-12-6	3	3.25	12.33	6.31				
Piedmont..... 4-10-6	12	4.11	10.40	6.32				
Piedmont..... 5-10-5	5	4.92	10.43	5.47				
Planters Fertil. & Phos. Co., Charleston, S. C.								
Pee Dee Tobacco..... 3-9-6	13	3.14	9.70	6.36				
Special Mixture..... 3-9-9	2	3.13	9.50	9.06	1	3.25	9.30	8.30
Special Mixture..... 3-12-6	7	3.25	11.99	6.24				
Special Mixture..... 4-8-8	11	4.45	8.45	8.64	2	4.35	8.38	7.14
Special Mixture..... 4-10-6	81	4.14	10.29	6.20	2	3.40	10.53	6.10
Special Mixture..... 4-12-4	2	4.55	11.60	4.55				
Special Mixture..... 5-10-5	20	5.12	10.15	5.47				
Tobacco Bed..... 6-9-3	6	6.13	9.92	3.49				
Planters Fertilizer & Phos. Co., Charlotte, N. C.								
Special Mixture..... 4-10-6	11	4.22	10.18	6.49				
Special Mixture..... 5-10-5	2	5.05	10.48	6.01				
Pringle A. F.) & Co., Charleston, S. C.								
Merco Premium Tobacco..... 3-9-6	58	3.19	9.21	6.47	2	2.58	7.73	5.16
Commander Brown Spec..... 3-9-6	1	3.60	9.20	6.36				
Merco Premium Tobacco..... 3-9-9	4	3.23	9.39	9.35				
Merco Special..... 3-9-9	11	3.19	9.29	9.85	2	2.75	9.13	7.98
Sweet Potato Spec..... 3-9-9	2	3.33	9.48	9.11				
Merco Special..... 3-12-6	5	3.37	12.11	6.55				
Merco Special..... 4-10-6	82	4.47	10.41	6.36	6	3.59	9.79	6.42
Merco Special..... 4-12-4					1	4.2	11.25	4.57
Merco Special..... 4-12-12	1	4.35	12.95	11.69				
Merco Special..... 5-10-5	44	5.00	10.18	5.55	1	5.05	9.40	5.35
Merco Plant Bed..... 6-9-3	9	6.04	10.05	3.72				
Merco Special..... 8-8-8	3	7.88	9.06	8.51				
Rabb & Smith, Fountain Inn, S. C.								
R & S Boll Filler..... 3-12-6					2	2.98	10.12	6.05
R & S Boll Filler..... 4-8-8	7	4.07	7.99	3.36	2	3.95	7.40	7.50
R & S Boll Filler..... 5-10-5	1	4.65	9.65	5.31	2	4.78	8.78	5.55
Rentz & Felder, Bamberg, S. C.								
Rich Harvest..... 4-10-6	2	3.83	10.20	6.21				
Rich Harvest..... 4-12-4					1	4.25	11.20	5.23
Reliance Fertilizer Co., Savannah, Ga.								
Reliance..... 3-9-9		29	9.63	9.64				
Reliance..... 3-12-6		5	10.05	7.09				
Reliance..... 4-8-8			8.66	9.15				
Reliance..... 4-10-6			10.43	6.47				
Reliance..... 5-10-5		15	19.75	5.33				

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	Reliance Guano Co., Whiteville, N. C.							
Golden Harvest Tob.	27	3.14	9.13	6.73				
Golden Harvest Tob.					1	3.50	11.50	8.21
Reliable Crop Grower	2	3.35	9.75	9.50	1	4.15	10.30	7.54
Reliable Crop Grower	2	3.20	12.25	6.54				
Reliable Crop Grower	2	3.95	8.00	7.60				
Reliable Crop Grower	16	4.38	10.88	6.27				
Reliable Crop Grower	5	5.22	10.45	5.54				
Ridge Fertilizer Co., Johnston, S. C.								
Pride of The Ridge	1	3.25	9.05	8.96				
Pride of The Ridge	5	4.10	7.92	8.41				
Pride of The Ridge	20	4.20	10.20	6.54	1	4.25	8.90	6.54
Royster (F. S.) Guano Co., Norfolk, Va.								
Bonanza Tobacco	48	3.18	9.22	6.26				
Perfecto Tobacco	27	3.21	9.27	9.11				
Royster's Ideal	48	3.16	9.49	9.29				
Royster's Triumph	13	3.27	12.08	6.38				
Royster's	115	4.21	10.18	6.36				
Royster's Trusty	17	4.19	8.61	8.38				
Royster's Dependable	28	5.11	10.20	5.43				
Royster's Boll Filler	4	5.05	10.01	5.51				
Royster's Truckers Delight	2	5.25	10.80	5.39				
Royster's Prem. Ideal	2	5.10	10.35	5.44				
Royster's Sterling	7	5.94	8.44	6.31				
Royster's Tobacco Bed	10	6.28	9.62	3.46				
Santee Guano Co., Greelyville, S. C.								
Santee Tob. Spec.	12	3.16	8.95	6.33	1	3.25	8.40	6.08
Santee	6	3.07	12.37	5.99				
Santee	10	3.95	9.97	6.42				
Salley Gin & Fertilizer Co., Salley, S. C.								
Salley's	2	4.00	10.33	6.38				
Smith-Douglass Co., Inc., Norfolk, Va.								
Smith Orange Tob.	8	3.57	9.14	6.28				
Smith Square Deal	6	4.42	10.16	6.06				
Smith Gro-Green	1	7.15	7.59	7.02				
Smith Smldo	1	6.05	7.75	6.24				
Smith Fertilizer Co., Williston, S. C.								
Smith's	2	3.78	8.75	8.37				
Smith's	4	4.01	10.89	6.54	1	4.35	10.45	4.70
Southern Cotton Oil Co., Allendale, S. C.								
SCO-SCO	1	4.00	9.85	6.29				
SCO-CO	1	5.00	10.00	4.98				
Southern Cotton Oil Co., Augusta, Ga.								
SCO-CO	1	4.00	9.85	6.29				
Southern Cotton Oil Co., Camden, S. C.								
SCO-CO	1	4.55	10.95	5.85				
Southern Cotton Oil Co., Charleston, S. C.								
SCO-CO					3	3.25	9.15	8.06
SCO-CO	5	3.29	12.23	6.20				
SCO-CO	19	4.11	10.10	6.32				
SCO-CO	1	5.35	9.85	5.36				
Southern Cotton Oil Co., Chester, S. C.								
SCO-CO	6	3.13	8.98	9.29	1	3.15	10.65	8.02
SCO-CO	1	3.40	12.45	6.03				
SCO-CO	2	4.15	8.33	7.64				
SCO-CO	13	4.19	10.44	6.37	2	4.33	9.00	6.70
SCO-CO	3	5.23	10.40	5.49				
Southern Cotton Oil Co., Columbia, S. C.								
SCO-CO					1	3.40	9.60	8.17
SCO-CO	2	3.95	9.88	6.15				
Southern Cotton Oil Co., Florence, S. C.								
SCO-CO Tobacco	11	3.13	9.22	6.40				
SCO-CO	2	3.38	12.00	6.41				
SCO-CO	1	4.00	8.10	7.64				
SCO-CO	9	4.16	10.37	6.27				

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SCO-CO 5-10-5	6	4.98	9.99	5.60				
SCO-CO Plant Bed 6-9-3	2	5.80	9.85	3.45				
Southern Cotton Oil Co., Gibson, N. C.								
SCO-CO 4-10-6	2	4.00	10.33	6.03				
Southern Cotton Oil Co., Greenville, S. C.								
SCO-CO 3-9-9	1	2.95	8.90	8.65				
SCO-CO 4-8-8	1	4.00	8.15	8.26				
SCO-CO 4-10-6	2	4.20	10.33	5.97				
SCO-CO 5-10-5	5	5.25	9.99	5.14				
Southern Cotton Oil Co., Laurens, S. C.								
SCO-CO 3-9-9	8	3.46	9.59	9.82				
SCO-CO 3-12-6	6	3.42	12.11	6.82	1	3.65	11.15	6.81
SCO-CO 4-8-8	5	4.31	8.97	8.30				
SCO-CO 4-10-6	18	4.23	10.17	6.64				
SCO-CO 5-10-5	28	5.38	10.34	5.62				
Southern Cotton Oil Co., Savannah, Ga.								
SCO-CO 3-12-6	1	3.50	12.20	5.91				
SCO-CO 4-10-6	21	4.07	10.12	6.19				
SCO-CO 5-10-5	2	4.85	10.08	5.48				
Southern Cotton Oil Co., Shelby, N. C.								
SCO-CO 4-8-8	1	3.70	8.75	8.15				
SCO-CO 4-10-6	1	4.35	10.65	5.75				
SCO-CO 5-10-10					1	4.40	10.95	10.66
Southern Cotton Oil Co., Spartanburg, S. C.								
SCO-CO 3-12-6	3	3.05	12.07	6.44				
SCO-CO 4-8-8	6	3.97	9.08	8.33				
SCO-CO 4-10-6	11	3.98	10.57	6.57				
SCO-CO 4-12-12	1	4.10	12.20	12.91				
SCO-CO 5-10-5	2	5.13	10.63	5.96				
Southern Cotton Oil Co., Wadesboro, N. C.								
SCO-CO 4-10-6	1	4.35	9.75	6.50				
Southern Fertz. & Chem. Co., Savannah, Ga.								
Gold Leaf Tobacco 3-9-8	19	2.98	9.41	6.12				
Santa Clara Tobacco 3-9-6	18	3.03	9.31	6.13				
Southern Sweet Potato 3-9-9	2	3.15	9.45	9.22				
Southern 3-9-9	4	3.09	9.25	9.33				
Southern 3-12-6	13	3.18	12.15	6.02				
Southern 4-8-8	6	4.18	8.03	8.14				
Southern 4-10-6	133	4.09	10.11	6.23	5	4.09	9.63	5.92
Southern 4-12-4	7	4.10	12.04	4.28				
Southern 5-10-5	37	4.97	10.07	5.28	1	4.45	9.45	5.84
Southern 6-8-6	13	5.82	8.24	6.22				
Southern Plant Bed 6-9-3	4	5.75	9.50	2.68				
Southern Top Dresser 8-8-8	2	7.70	8.50	7.68				
South. States Phos. & Fertz. Co., Savannah, Ga.								
Southern States 3-12-6	1	3.00	11.75	6.02				
Southern States 4-8-8	1	7.60	8.50	8.68				
Southern States 4-10-6	4	4.04	10.53	6.09				
Sumter Fertilizer Mfg. Co., Sumter, S. C.								
Wulbern Tobacco Special 3-9-6	1	2.85	8.70	6.70				
Wulbern Wonder Worker 3-9-9	5	3.00	9.24	9.26				
Wulbern Wonder Worker 3-12-6	2	3.25	12.68	6.66				
Wulbern Wonder Worker 4-10-6	12	4.69	10.15	6.21				
Wulbern Wonder Worker 5-10-5	5	4.84	10.59	5.31				
Swift & Co., Plant Food Div., Columbia, S. C.								
Red Steer 3-9-9	15	2.92	9.39	9.32				
Red Steer 3-12-6	5	2.99	11.41	6.59				
Red Steer 4-8-8	11	3.95	8.43	8.27				
Peach Grower 4-8-8	2		8.05	8.13				
Red Steer 4-10-6	78		10.14	6.38				
Swift's Brimm 5-10-5	6	4.96	10.04	5.52				
Red Steer 5-10-5	12	4.93	10.26	5.56				
Red Steer 6-8-6	5	5.94	8.82	6.36	1	5.29	8.75	6.36
Vigoro Commercial Grower 6-8-6	1	5.75	8.43	6.22				

TABLE 1—Nitrogen, Phosphoric Acid and Potash

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Swift & Co., Plant Food Div., Savannah, Ga.								
Red Steer Tob. Grower.....	3-9-6	1	3.55	8.70	6.30			
Red Steer.....	3-12-6	2	3.20	11.50	6.26			
Red Steer.....	4-10-6	9	4.11	9.96	6.39			
Red Steer.....	5-10-5	7	4.92	10.09	5.47			
Swift & Co., Plant Food Div., Wilmington, N.C.								
Red Steer Tob. Grower.....	3-9-6	6	3.33	9.36	6.31			
Blenn Tob. Grower.....	3-9-6	13	3.39	9.25	6.13			
Red Steer.....	3-12-6	4	3.18	12.34	6.18			
Red Steer.....	4-10-6	19	3.99	10.46	6.29			
Red Steer.....	4-12-4	2	4.05	12.35	4.14			
Vigoro for Plant Beds.....	4-12-4	2	4.20	12.65	4.46			
Red Steer.....	5-10-5	3	5.03	10.60	5.15			
Red Steer.....	6-8-6	1	5.70	8.40	5.85			
Vigoro Commercial Grower.....	6-8-6	4	5.89	8.74	6.26			
Plant Bed Special.....	6-9-3	1	5.90	9.15	3.41			
Tennessee Corporation, East Point, Ga.								
S. A. C. Superior.....	4-10-6	1	4.65	9.80	6.36			
S. A. C. Superior.....	5-10-5	2	5.40	9.90	5.30			
S. A. C. Superior.....	6-8-6	1	6.25	8.40	6.63			
Tyler, (J. A.) & Sons, Wagener, S. C.								
Tyler's.....	3-9-9	3	3.13	9.35	9.54			
Tyler's.....	4-10-6	2	4.10	10.35	6.56			
Union Oil Mills, Union, S. C.								
U. O. M.....	3-9-9	3	3.33	9.38	8.89			
U. O. M.....	3-12-6	1	3.50	12.95	5.78			
U. O. M.....	4-10-6	42	4.13	10.26	6.23			
Victor Fertilizer Co., Chester, S. C.								
Victor.....	3-9-9	12	3.08	9.24	9.28			
Victor.....	3-12-6	3	3.12	11.82	6.17			
Victor.....	4-8-8	12	3.97	8.37	8.25			
Victor.....	4-10-6	37	3.99	10.12	6.24			
Victor.....	5-10-5	1	4.90	10.20	5.93			
Virginia-Carolina Chem. Corp., Richmond, Va.								
V-C Indian Brand Tob.....	3-9-6	44	3.15	9.52	6.13			
V-C Sweet Potato.....	3-9-9	2	2.83	9.45	9.30			
V-C.....	3-9-9	16	3.16	9.32	9.03	1	3.15	10.00
V-C.....	3-12-6	24	3.21	12.24	6.18			
V-C.....	4-8-8	5	4.06	7.95	8.50			
V-C.....	4-12-4	3	3.97	12.42	4.25			
V-C.....	4-10-6	175	4.09	10.22	6.17			
V-C.....	5-10-5	49	5.04	10.27	5.37	1	4.25	10.20
V-C.....	6-8-6	16	5.89	8.34	6.36	1	5.05	8.70
V-C Plant Bed.....	6-9-3	6	5.94	9.48	3.58			
West Carolina Fertz. Co., Dunbarton, S. C.								
Wes-Car-Co.....	3-9-9	1	3.10	9.65	10.02			
Wes-Car-Co.....	4-10-6	1	4.35	9.60	6.61			
Westminster Gin & Fertz. Co., Westminster, S.C.								
Marett's.....	4-8-8	5	4.16	8.34	8.45			
Marett's.....	4-10-6	2	4.28	10.20	6.68	1	4.40	9.30
Marett's.....	4-12-4	1	3.75	12.40	4.67			
Williston Fertilizer Works, Williston, S. C.								
Customer's Formula.....	3-9-9	4	3.15	9.15	9.60			
Customer's Formula.....	4-8-8	2	4.23	9.08	9.00			
Customer's Formula.....	4-10-6	4	4.20	10.25	7.61	2	3.30	9.93
Customer's Formula.....	6-8-6	1	5.60	8.10	7.27			
Wilmington Oil & Fertz. Co., Wl'gton, N. C.								
Wilmington Banner.....	3-12-6	1	3.10	12.00	5.95			
Wilmington Cotton & Corn.....	4-10-6	2	4.06	9.93	5.99			
Woodward Fertilizer Co., Aiken, S. C.								
Palmetto.....	3-9-9	1	3.60	9.15	11.14			
Palmetto.....	4-10-6	12	3.90	10.05	5.90	2	3.75	9.45
Palmetto.....	5-10-5	2	4.78	9.73	5.25			
Wray (Chas. F.) & Co., Rockaway, S. C.								
WPAYCO.....	4-10-6	9	4.07	10.07	6.52	1	4.45	9.35



POWER MACHINERY MOVING MIXED FERTILIZER (3-9-9) FROM CURING PILE TO BAGGING MACHINE

TABLE 2—Nitrogen

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Anderson Fertilizer Co., Anderson, S. C. Sulphate of Ammonia.....20.5%	1	20.40						
American Cyanamid Co., New York, N. Y. Aero Cyanamid.....20.6%	2	20.40						
Associated Cooperatives, Inc., Sheffield, Ala. Ammonium Nitrate.....32.5%	2	33.00						
Barrett Div. Allied Chem. & Dye Co., NY, N.Y. Arcadian Nitrate of Soda.....16%	5	16.06						
Buckeye Cotton Oil Co., Augusta, Ga. Cottonseed Meal.....5.76%	1	5.60						
Chilean Nitrate Sales Corp. New York, N. Y. Champion Nitrate of Soda.....16%	13	16.03						
Ford Motor Co., Dearborn, Mich. Ammonium Sulphate.....20.8%	1	20.8						
Logan-Robinson Fertz. Co., Charleston, S. C. Sulphate of Ammonia.....20.5%	4	20.6						
Molony Fertilizer Co., Charleston, S. C. Sulphate of Ammonia.....21.5%	1	21.4						
Planters Fertz. & Phos. Co., Charleston, S. C. Sulphate of Ammonia.....20.5%	3	20.5						
Pringle (A. F. & Co., Charleston, S. C. Sulphate of Ammonia.....20.5%	3	20.57						
Ridge Fertilizer Co, Johnston, S. C. Sulphate of Ammonia.....20.5%	3	20.60						
Southern Cotton Oil Co., Columbia, S. C. Sulphate of Ammonia.....20.5%	1	20.5						
Southern Fertz. & Chem. Co., Savannah, Ga. Sulphate of Ammonia.....20.5%	1	20.6						
Synthetic Nitrogen Prod. Corp., New York Cal-Nitro.....20.5%	13	20.56						
Victor Fertilizer Co., Chester, S. C. Uramon & Lime.....20. %	1	20.6						
Woodward Fertilizer Co., Aiken, S. C. Sulphate of Ammonia.....20.5%	1	20.6						

TABLE 3—Phosphoric Acid

American Agri. Chem. Co., New York, N. Y. Superphosphate.....18%	11	19.05					
Armour Fertilizer Works, Columbia, S. C. Superphosphate.....19%	1	19.90					
Brown Fertilizer Co., Lockville, S. C. Superphosphate.....18%	1	19.25					
Davison Chemical Corp., Savannah, Ga. Superphosphate.....18%	1	18.25					
Harrison Fertilizer Co., Trenton, S. C. Superphosphate.....18%				1	16.85		
Manning Chemical Co., Lenoir, S. C. Superphosphate.....19%	1	20.40					
Myones Fertilizer Corp., Charleston, S. C. Superphosphate.....18%	1	18.75					
Naco Fertilizer Co., Charleston, S. C. Superphosphate.....18%	1	20.00					
Pendleton Oil Mill, Pendleton, S. C. Superphosphate.....19%	1	19.20					
Pidge Fertilizer Co., Johnston, S. C. Superphosphate.....18%	1	18.65					
Sartez Guano Co., Greenville, S. C. Superphosphate.....18%	1	18.70					
Southern Fertilizer Co., Savannah, Ga. Superphosphate.....20%	1	19.60					
Swift & Co., Food Div., Columbia, S. C. Superphosphate.....19%	2	19.75					

TABLE 3—Phosphoric Acid

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Tennessee, Coal, Iron & RR. Birm'ham, Ala. Basic Slag 8% Total	2		†12.10					
Thompson Sales Co., Cordele, Ga. Cal.-Phos. 18% Total 0% Avail.	3		†19.12					
Tenn. Valley Authority, Sheffield, Ala. Concentrated Super. 48%	1		48.00					
Union Oil Mills, Union, S. C. Superphosphate 18%	1		19.00					
Va.-Carolina Chem. Corp., Richmond, Va. Superphosphate 18%	2		18.78					

TABLE 4—Potash

Acme Fertilizer Co., Wilmington, N. C. Sul. Pot.-Mag. 21.5%	1		21.42					
Sulphate of Potash 48%	1		48.00					
Muriate of Potash 50%		1					46.56	
Aiken Fertilizer Co., Aiken, S. C. Muriate of Potash 50%	1		50.08					
Brown Fertilizer Co., Blackville, S. C. Manure Salts 25%	2		25.49					
Muriate of Potash 50%		1					46.68	
Carolina Mixing Co., Fairfax, S. C. Muriate of Potash 60%	1		60.32					
Catawba Fertilizer Co., Lancaster, S. C. Muriate of Potash 50%	1		49.60					
Cedar Lawn Fertz. Co., Kingstree, S. C. Muriate of Potash 61.37%	1		60.96					
Coleman Guano Co., Pamplico, S. C. Muriate of Potash 50%	1		50.89					
Culler (J. E.) Fertz. Co., North, S. C. Manure Salts 25%	2		26.27					
Denmark Fertilizer Co., Denmark, S. C. Manure Salts 25%		1					23.58	
Muriate of Potash 60%	1		61.02					
Dixie Guano Co., Laurinburg, N. C. Sulphate of Potash 50%	2		51.36		1			48.24
Dillon Fertilizer Co., Dillon, S. C. Sulphate of Potash 50%	3		51.75					
Eastover Fertilizer Co., St. Matthews, S. C. Manure Salts 25%	1		24.50					
Edisto River Fertz. Co., Blackville, S. C. Manure Salts 25%	1		25.82					
Muriate of Potash 60%	1		61.60					
Etiwan Fertilizer Co., Charleston, S. C. Manure Salts 25%	3		25.85					
Sulphate of Potash 48%	3		48.23					
Muriate of Potash 62%	1		62.55					
Greenville Cotton Oil Mill, Inc., G'ville, S. C. Muriate of Potash 50%	1		50.55					
Gunter, C. G., Inc., Greenville, S. C. Muriate of Potash 50%	1		51.66					
Harrison Fertilizer Co., Trenton, S. C. Muriate of Potash 50%	1		50.48					
Holly Hill Fertz. Co., Holly Hill, S. C. Manure Salts 26%	3		25.65					
Home Guano Co., Mullins, S. C. Sul. Pot. Mag. 21%	2		21.77					
Manure Salts 23%	8		23.47					
Sulphate of Potash 48%	1		48.40					
Internat. Min. & Chem. Corp., Augusta, Ga. Sul. Pot. Mag. 21.5%	2		21.50					
Muriate of Potash 50%	1		51.00					

†Total Phosphoric Acid

TABLE 4—Potash

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Internat. Min. & Chem. Corp., Hartsville, S. C.								
Sul. Pot. Mag. 21.5%	1			22.02				
Muriate of Potash 50%	2			51.40				
Kershaw Oil Mill, Kershaw, S. C.								
Muriate of Potash 50%	1			51.20				
Loyan-Robinson Fertz. Co., Charleston, S. C.								
Sul. Pot. Mag. 21.5%	2			21.65				
Manure Salts 25%	10			25.36				
Manning & Shine, Latta, S. C.								
Manure Salts 24%	2			25.32				
Marion Cotton Oil Co., Marion, S. C.								
Manure Salts 25%	1			26.54				
Muriate of Potash 60%	1			59.68				
Maybank Fertilizer Corp., Charleston, S. C.								
Sul. Pot. Mag. 21%	2			21.71				
Manure Salts 25%	7			25.19				
Muriate of Potash 50%	1			49.76	6			47.96
Molony Fertilizer Co., Charleston, S. C.								
Muriate of Potash 60%					1			57.52
Naco Fertilizer Co., Charleston, S. C.								
Manure Salts 25%	3			25.60	2			24.07
Muriate of Potash 50%	1			49.52				
Naco Fertilizer Co., Wilmington, N. C.								
Sulphate Potash Mag. 22%	1			21.68				
Manure Salts 25%	5			25.28				
Sulphate of Potash 50%					1			45.68
Muriate of Potash 50%	2			49.94	2			48.56
Pendleton Oil Mill, Pendleton, S. C.								
Manure Salts 25%	2			25.83				
Peoples Fertilizer Co., New Zion, S. C.								
Muriate of Potash 50%	1			51.92				
Planters Fertz. & Phos. Co., Charleston, S. C.								
Manure Salts 25%	1			24.72				
Pringle (A. F.) & Co., Charleston, S. C.								
Sulphate Pot-Mag. 22%	1			21.86				
Manure Salts 24%	8			25.45				
Manure Salts 25%	1			25.38				
Muriate of Potash 48%	6			50.99				
Rentz & Felder, Bamberg, S. C.								
Manure Salts 25%	1			25.16				
Reliance Fertilizer Co., Savannah, Ga.								
Muriate of Potash 50%	1			51.28				
Ridge Fertilizer Co., Johnston, S. C.								
Manure Salts 22%	5			25.50				
Muriate of Potash 60%	1			61.36				
Royster (F. S.) Guano Co., Norfolk, Va.								
Manure Salts 25%	4			25.99				
Santee Guano Co., Greelyville, S. C.								
Manure Salts 25%	1			24.58				
Muriate of Potash 50%	1			49.88	1			48.40
Smith Douglas Co., Inc., Norfolk, Va.								
Manure Salts 25%	1			25.05				
Sulphate of Potash 48%				48.44				
Southern Cotton Oil Co., Laurens, S. C.								
Muriate of Potash 50%	1			49.50				
Southern Cotton Oil Co., Sumter, S. C.								
Manure Salts 25%	2			26.43				
Southern Fertz. & Chem. Co., Savannah, Ga.								
Manure Salts 25%	1			26.96				
Sumter Fert. Mfg. Co., Sumter, S. C.								
Muriate of Potash 51%	2			50.56	1			48.40
Victor Fertilizer Co., Chester, S. C.								
Muriate of Potash 50%	2			61.70				

TABLE 4—Potash

Manufacturer, Brand and Guaranteed Analysis	Average Analyses of Samples Meeting Requirements				Average Analyses of Samples Not Meeting Requirements (Deficient)			
	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash	No. Samples	Available Nitrogen	Available Phosphoric Acid	Available Potash
Va.-Carolina Chem. Corp., Richmond, Va.								
Sul. Pot. Mag. 21%	1			21.64				
Manure Salts 25%	8			25.66				
Muriate of Potash 50%	1			49.52				
West Union Gin Co., West Union, S. C.								
Muriate of Potash 60%	1			60.00				
Wilmington Oil & Fertz. Co., Wilm'ton, N. C.								
Manure Salts 25%					1			23.92
Woodward Fertilizer Co., Aiken, S. C.								
Muriate of Potash 50%	3			50.13				
Woodrow Fertilizer Co., Oswego, S. C.								
Muriate of Potash 60%	1			60.08				

TABLE 5—Nitrogen and Phosphoric Acid

Armour Fertilizer Works, Columbia, S. C.								
Armour's Big Crop 10-10-0	2	9.77	11.10					16.30
Molony Fertilizer Co., Charleston, S. C.								
Top Dresser 8-12-0	1	7.65	12.70					
Planters Fertz. & Phos. Co., Charleston, S. C.								
Top Dresser 10-10-0	3	10.12	10.70					
Pringle (A. F.) & Co., Charleston, S. C.								
Bean Special 4-16-0	3	3.97	16.53					
Va.-Carolina Chem. Corp., Richmond, Va.								
V-C Top Dresser 10-10-0	10	9.76	11.30		2	9.1		

TABLE 6—Phosphoric Acid and Potash

Armour Fertilizer Works, Columbia, S. C.								
Armour's Big Crop 0-14-7	2		15.00	7.50				
Epting Distributing Co., Leesville, S. C.								
Double Duty 0-12-12	2		11.63	12.98				
Josey Fertilizer Corp., Wilmington, N. C.								
Lime Phosphate Potash 0-14-7	1		13.50	7.50				
Logan-Robinson Fertilizer Co., Char'ton, S. C.								
L. R. Giant Acid Phos. 0-12-12	2		12.68	12.93				
Merco Company of Gaffney, Gaffney, S. C.								
Superphosphate & Potash 0-12-12	1		12.00	13.97				
Naco Fertilizer Co., Charleston, S. C.								
Superphosphate & Potash 0-12-12	2		12.05	12.70				
Superphosphate Pot. Mix 0-14-7	2		14.13	7.59				
Planters Fertz. & Phos. Co., Charleston, S. C.								
Acid and Potash 0-12-12					1		13.12	16.98
Acid & Potash 0-14-7	1		13.65	7.55				
Royster (F. S.) Guano Co., Norfolk, Va.								
Phosphate & Potash 0-12-12	2		12.15	12.12				
Swift & Co., Plant Food Div., Columbia, S. C.								
Red Steer 0-14-7	4		14.45	7.71				
Va.-Carolina Chem. Corp., Richmond, Va.								
Superphosphate with Potash 0-14-7	2		15.08	7.00				
Woodward Fertilizer Co., Aiken, S. C.								
Phosphate & Potash 0-12-12	1		12.55	11.57				

Manufacturer, Brand and Guaranteed Analysis	No. Samples	Guarantee	Found	% Excessive	
Armour Fertilizer Works, Wilmington, N. C.					
Plant Bed.....	6-9-3	1	.50	.82	64
Davison Chemical Corp., Savannah, Ga.....					
Davco Tobacco.....	3-9-6	1	2.00	2.94	47
Davco Tobacco.....	3-9-9	1	2.00	2.88	44
Dixie Guano Co., Laurinburg, N. C.					
Tobacco Plant Bed.....	6-9-3	2	.50	.97	94
Home Guano Co., Mullins, S. C.					
Cooper's Di-Ho-Ma Tob.....	3-9-6	1	3.00	4.24	41
International Min. & Chem. Corp., Hartsville, S. C.					
Hartsville Plant Bed.....	6-9-3	1	.50	1.78	256
International Min. & Chem. Corp., Wilmington, N. C.					
Tobacco Plant Bed.....	6-9-3	2	.50	.90	80
Jordan (C. M.), Angelus, S. C.					
Tobacco Grower.....	3-9-9	1	2.00	3.54	77
Molony Fertilizer Co., Charleston, S. C.					
Special Tobacco.....	3-9-6	3	2.00	3.43	72
Pringle (A. F.) & Company, Charleston, S. C.					
Merco Plant Bed.....	6-9-3	1	.50	.90	80
Reliance Guano Co., Whiteville, N. C.					
Golden Harvest Tob.....	3-9-6	2	3.00	4.98	99
Southern Fertz. & Chem. Co., Savannah, Ga.....					
Tobacco Plant Bed.....	6-9-3	1	.50	.98	96



MODERN EQUIPMENT MAKES FOR EFFICIENT PLANT OPERATION
 (Bagging machine, sewing machine, bag conveyor at work)