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BEING THE

FERTILIZER REPORT FOR 1919

CONNECTICUT
AGRICULTURAL EXPERIMENT STATION
NEW HAVEN, CONN.

BULLETIN 217

DECEMBER, 1919

Fertilizer Report for 1919

By E. H. JENKINS, *Director, and*
E. MONROE BAILEY, *Chemist in Charge*
of the Analytical Laboratory.

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December, 1919.

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Report on Commercial Fertilizers, 1919.

BY E. H. JENKINS, *Director*, and E. M. BAILEY,
Chemist in Charge of the Analytical Laboratory.

In 1919, forty-eight individuals and firms entered 339 brands of fertilizers for sale in this state, classified as follows:

Nitrogenous superphosphates with potash	108
Nitrogenous superphosphates without potash	158
Bone manures and tankage	23
Fish, castor pomace, chemicals and miscellaneous	50
Total	339

During the spring months Mr. Churchill, the Station's agent, visited 98 towns and villages in the state and gathered 501 samples. These represented all the registered brands except the following:

American Agricultural Chemical Co.'s Grass and Oats Fertilizer¹, *East India* Mayflower 1916¹; *Bowker's* Stockbridge 5-8 General Crop; *Listers'* Complete Tobacco Manure 1916¹, *Crescent Ammoniated Superphosphate* 1916¹, *Excelsior* Guano 1916, 1-8-2 Fertilizer¹, *Squirrel Brand* Fertilizer 1916¹; *National Nitrogen Phosphate Mixture* No. 6; *Nitrate Agencies Co.'s* Ground Bone, 4-8-2 Fish and Potash Formula; *H. G.* Ground Tankage; *Parmenter & Polsey's* Potato Fertilizer; *Pawtucket Rendering Co.'s* Animal 3½-10²; *Sanderson's* Plain Superphosphate.³

¹ Not sold in the state.

² Manufacturer's sample analyzed.

³ Purchaser's sample analyzed.

Of the fifteen samples above listed six were not sold in the state, and of two other brands, one manufacturer's sample and one purchaser's sample were analyzed.

CLASSIFICATION OF FERTILIZERS ANALYZED.

	Number of samples.
<i>1. Containing nitrogen as the chief active ingredient:</i>	
Nitrate of soda	8
Sulphate of ammonia	1
Cotton seed meal	95
Castor pomace	4
Peanut meal	1
<i>2. Containing phosphoric acid as the chief active ingredient:</i>	
"Barium-phosphate"	3
Raw rock phosphate	2
Precipitated bone phosphate	2
Basic lime phosphate	2
Acid phosphate	16
<i>3. Containing potash as the chief active ingredient:</i>	
Cotton hull ashes	3
Other potash materials	13
<i>4. Containing nitrogen and phosphoric acid:</i>	
Fish manures	15
Slaughter house tankage	9
Bone and tankage	1
Bone manures	16
<i>5. Mixed fertilizers:</i>	
Nitrogenous superphosphates without potash	166
Nitrogenous superphosphates with potash	108
Home-mixed fertilizers	4
<i>6. Miscellaneous fertilizers and waste products:</i>	
Tobacco stems and stalks	3
Lime-Fertile and Nitro-Fertile	2
Sheep manure	10
Wood ashes	21
Lime and lime-kiln ashes	3
Peat and muck	7
Other miscellaneous articles (soils not included)	27
Total	542

I. RAW MATERIALS CHIEFLY VALUABLE FOR NITROGEN.

NITRATE OF SODA.

Eight samples were analyzed as follows:

12533. Sold by Apothecaries Hall Co., Waterbury. Sampled at the factory.

12562. Sold by Sanderson Fertilizer & Chemical Co., New Haven. Sampled at the factory.

12889. Sold by Coe-Mortimer Co., New York City. Stock of C. E. Taylor, Meriden.

12734. Sold by Armour Fertilizer Works, Chrome, N. J. Stock of Geo. S. Phelps & Co., Thompsonville.

12728. Sold by American Agricultural Chemical Co., New York City. Stock of C. Buckingham, Southport.

12987. Sold by Nitrate Agencies Co., New York City. Stock of F. S. Platt Co., New Haven.

12718. Sent by G. S. Jennings, Southport.

12891. Sold by Wilcox Fertilizer Co., Mystic. Sampled at factory.

ANALYSES OF NITRATE OF SODA.

Station No.	12533	12562	12889	12734	12728	12987	12718	12891
<i>Per cent. of</i>								
Nitrogen guaranteed	15.00	15.00	15.00	14.81	15.00	15.00	....	15.00
Nitrogen found	15.60	15.08	15.04	15.64	15.42	15.80	15.92	15.36
Cost per ton	\$90.00	90.00	95.00	100.00	100.00	110.00	....	....
Nitrogen costs cents								
per pound	28.8	29.8	31.5*	31.9	32.4	34.8	....	....

All of the samples examined fully met their guaranties and all were of average quality.

The cost of nitrogen in these samples ranged from about 29 to 35 cents per pound, the average being 31.5 cents.

Nitrate of soda has been a relatively cheap source of fertilizer nitrogen this year. The nitrogen in it is more quickly and completely available to crops than nitrogen from any other commercial source. As a spring top-dressing on grass land and on

* f. o. b. Cartaret, N. J.

winter grain which has suffered some winter-killing, as well as a source of nitrogen in home mixtures, nitrate of soda deserves more attention and use than it has received from farmers.

The figures gathered by the Bureau of Soils at Washington indicate that about 29 per cent. of the nitrogen in the mixed fertilizers made in 1918 was in form of nitrate of soda, 16 per cent. in form of sulphate of ammonia and the balance, about 55 per cent., in organic forms. These percentages probably will change with changes in the relative cost of the three forms of nitrogen.

The price of nitrate in Chili is fixed by what is bid in the London market. During the war the demands for the manufacture of munitions and the scarcity of shipping, high insurance rates, etc., caused nitrate to advance sharply in price and then to disappear from the market. At this writing, November, 1919, the wholesale quotation is \$58 per ton which should represent a retail price of about \$70.

SULPHATE OF AMMONIA.

Only a single sample was examined.

12560. Sold by the Barrett Co., New York City. Stock of Berkshire Fertilizer Co. Cost \$100 per ton. It contained 20.9 per cent. of nitrogen. Nitrogen in this article therefore cost 23.9 cents per pound, which is the cheapest source of nitrogen that has been in our market this year.

COTTON SEED MEAL.

Ninety-five samples of meal bought for use as a fertilizer have been examined.

Seventy-six of them met their guaranteed compositions and need no further notice here. Seventeen failed to meet their guaranties and their analyses appear in the following table.

The average percentage of nitrogen in the 95 samples examined was 5.97 and the average ton cost, in car lots, \$63.21.

The average nitrogen content of the samples which met their guaranty was 6.11 per cent.; the average of those which failed to meet their guaranties was 5.71 per cent.

Cotton seed meal contains about 2.9 per cent. of phosphoric acid and 1.9 per cent. of potash.

These ingredients are not guaranteed and are disregarded in sales. Charging the cost of meal wholly to nitrogen, the average cost per pound of nitrogen has been 53 cents.

If the phosphoric acid in the meal is credited at 6 cents and potash at 30 cents, the average cost of nitrogen as shown by our analyses has been 40.5 cents per pound.

The average figures for the past seven years are as follows:

Year.	Number analyzed.	Cost per ton.	Per cent. nitrogen.	Nitrogen costs cents per pound.
1913	315	\$33.00	6.89	20.7
1914	224	....	6.77	21.6
1915	182	....	6.96	19.9
1916	177	39.52	6.65	20.9
1917	95	44.20	6.10	26.5
1918	56	57.41	5.98	36.0
1919	95	63.21	5.97	40.5

There has been a yearly rise in the average price of cotton seed meal, amounting to 91 per cent., a yearly decrease in the amount of nitrogen amounting to 13 per cent. and in consequence the actual cost per pound of nitrogen has increased nearly 95 per cent. At this writing, November 1919, cotton seed meal is quoted in New York at \$70 to \$75 per ton.

As evidence of the economic confusion wrought by the war, it is stated that Egypt has 85,000 tons of meal for which there is no home demand and no shipping available to transport it.

Coal on the other hand is hard to get at \$80 per ton in that country and cotton seed cake is being used for heating. $1\frac{3}{4}$ tons of cake is said to be the equivalent in heating power of one ton of coal.

There appears to be no present prospect of cheaper cotton seed meal in the market.

Under the new fertilizer law cotton seed meal is classed as a commercial fertilizer and is subject to the same requirements as any other fertilizer.

CASTOR POMACE.

Four samples were analyzed as follows:

12730. Sold by American Agricultural Chemical Co., New York City. Stock of W. Howard, Windsor.

12732. Sold by Apothecaries Hall Co., Waterbury. Stock of Wm. J. Reeves, Windsorville.

COTTON SEED MEALS BELOW GUARANTY.

Station No.	Manufacturer or Jobber, Car No. or Marks.	Purchased, Sampled or Sent by	Per cent. Nitrogen.		Cost per ton.
			Found.	Guaranteed.	
	American Cotton Oil Co., New York City.				
12449	62640	Griffin Tobacco Co., No. Bloomfield	4.14	5.76	....
	F. W. Brode & Co., Memphis, Tenn.				
12028	34825	Ernest N. Austin, Suffield	6.32	6.58	\$56.00
12737	.....	E. N. Austin, Suffield	6.29	6.50	60.00
	The Buckeye Cotton Oil Co., Cincinnati, Ohio.				
12454	40069	Griffin Tobacco Co., No. Bloomfield	5.50	5.76	....
12457	88578	Griffin Tobacco Co., No. Bloomfield	5.47	5.76	....
12624	2240 N. Y., P. & N.	Spencer Bros., Inc., Suffield	5.48	5.76	65.00
12625	52310 P. M.	Spencer Bros., Inc., Suffield	5.53	5.76	65.00
12679	2775 L. & N.	Spencer Bros., Inc., Suffield	5.20	5.76	65.00
12741	97818 Erie	Spencer Bros., Inc., Suffield	5.48	5.76	64.50
	E. Crosby & Co., Brattleboro, Vt.				
12659	52618 G. K.	George S. Phelps & Co., Thomp- sonville	5.51	5.75	66.00
	Humphreys-Godwin Co., Memphis, Tenn.				
12796	142132 I. C.	Loomis Bros Co., Granby	4.89	5.76	....
	Olds & Whipple, Hartford.				
11512	.....	O. H. Osborne, Warehouse Point	6.34	7.00	....
12194	.....	.....	6.68	7.00	....
	Park & Pollard Co., Boston, Mass.				
12771	.....	Ahern Bros., East Windsor Hill.	6.30	6.56	....
12687	71404 U. P.	Ahern Bros., East Windsor Hill.	6.28	6.56	72.00
	J. E. Soper Co., Boston, Mass.				
12501	43588 R. I.	Spencer Bros., Inc., Suffield	5.33	5.76	64.50
12502	115177 N. Y. C. & H. R.	Spencer Bros., Inc., Suffield	5.57	5.76	64.50

12565. Sold by H. J. Baker & Bro., New York City. Stock of Olds & Whipple, Hartford.

12665. Sent by L. J. Prior, East Hartford.

ANALYSES OF CASTOR POMACE.

Station No.	12730	12732	12565	12665
<i>Per cent. of</i>				
Nitrogen guaranteed	4.53	4.52	4.50	....
Nitrogen found	4.43	5.34	5.82	5.45
Cost per ton	\$62.00	\$55.00	\$55.10	....

Castor pomace of average composition contains about 1.95 per cent. of phosphoric acid and 0.95 per cent. of potash. If we value them at 6 cents and 30 cents per pound respectively

Castor pomace at about the average price of \$57 per ton has furnished nitrogen for about 47.1 cents per pound, six cents more than its cost in cotton seed meal.

PEANUT MEAL.

11719. Peanut meal, sent by F. B. Sherwood, New Milford, contains nitrogen 6.30 per cent., phosphoric acid 1.51 and potash 1.42 per cent. There can be little doubt that it would serve as a substitute for cotton seed meal in tobacco fertilizers.

II. RAW MATERIALS CHIEFLY VALUABLE FOR PHOSPHORIC ACID.

BARIUM-PHOSPHATE.

12567. Grade B. Sold by Witherbee, Sherman & Co., Port Henry, N. Y. Stock of A. N. Pierson Inc., Cromwell. Guaranteed 16 per cent. phosphoric acid. Cost \$18.00 per ton.

It contained 15.61 per cent. phosphoric acid, chiefly in insoluble form.

12892. Grade C. Sold by Witherbee, Sherman & Co., Port Henry, N. Y. Stock of Raymond Coleman, Cheshire. Guaranteed 14 per cent. phosphoric acid. Cost \$22.50 per ton.

It contained 14.98 per cent. phosphoric acid. Barium-Phosphate is a misnomer. The material is apparently a mixture of ground apatite with some sulphide of barium.

The state of combination of the sulphur in this mixture is shown in the following table.

12567 is new stock. 12306 is material which had lain in storage since last year.

	12567	12306
Total phosphoric acid	15.61	15.35
"Available" phosphoric acid	0.54	0.52
Insoluble phosphoric acid	15.07	14.83

	12567	12306
Total sulphur	0.88	1.49
Of which as sulphide	0.63	0.58
Of which as sulphate	0.03	0.28
Of which as thiosulphate	0.22	0.63
Total barium	3.12	5.42
Of which soluble in acid ..	3.01	4.28
Free sulphur .....	.....	.0025

The differences between the two are probably in part due to atmospheric action and in part are differences in the original composition.

The actual amount of barium sulphide cannot exceed 3.32 per cent.

RAW ROCK PHOSPHATE.

Two samples were analyzed as follows:

13321. Tacco Ground Phosphate. Sold by Tennessee Agricultural Chemical Corporation, Centerville, Tenn. Sent by A. W. Forbes, East Haven.

12890. Phoslime. Sold by Florida Soft Phosphate & Lime Co., Ocala, Fla. Stock of Meriden Grain & Feed Co., Meriden.

ANALYSES OF RAW ROCK PHOSPHATE.

Station No.	13321	12890
Water-soluble phosphoric acid	0.16	....
Citrate-soluble phosphoric acid	1.19	....
Citrate-insoluble phosphoric acid	25.74	....
Total phosphoric acid	27.09	21.95
"Available" phosphoric acid found	1.35	....
Cost per ton .....	....	\$40.00

PRECIPITATED BONE PHOSPHATE.

Two samples analyzed as follows:

12726. Sold by Olds & Whipple, Hartford. Sampled at factory. Cost \$1.60 per unit available phosphoric acid.

12667. Sent by L. J. Prior, East Hartford.

ANALYSES OF PRECIPITATED BONE PHOSPHATE.

Station No.	12726	12667
Water-soluble phosphoric acid	2.12	1.86
Citrate-soluble phosphoric acid	26.80	32.48
Citrate-insoluble phosphoric acid	3.44	3.58
Total phosphoric acid	32.36	37.92
"Available" phosphoric acid found	28.92	34.34
"Available" phosphoric acid guaranteed	32.00	....
Cost of "available" phosphoric acid per pound	8¢	....

This is essentially a calcium phosphate, a by-product of chemical manufacture, very fine and, as the analyses show, in very soluble condition.

BASIC LIME PHOSPHATE.

Two samples were analyzed as follows:

12729. Sold by American Agricultural Chemical Co., New York City. Stock of S. B. Warner, Windsor. Cost \$27.75 per ton. Guaranteed 13 per cent. "available" phosphoric acid, 14 per cent. total phosphoric acid.

12800. Basic Fruit and Legume Phosphate. Sold by Coe Mortimer Co., New York City. Stock of J. M. Harmon, Meriden. Cost \$24.50 per ton. Guaranteed 13 per cent. "available" phosphoric acid, 14 per cent. total phosphoric acid.

ANALYSES OF BASIC LIME PHOSPHATE.

Station No.	12729	12800
Water-soluble phosphoric acid	1.40	6.62
Citrate-soluble phosphoric acid	12.74	7.42
Citrate-insoluble phosphoric acid	1.13	1.06
Total phosphoric acid	15.27	15.10
"Available" phosphoric acid	14.14	14.04
Cost of "available" phosphoric acid per pound	9.8¢	8.7¢

DISSOLVED ROCK PHOSPHATE OR ACID PHOSPHATE.

Sixteen samples were analyzed as follows:

12669. Sold by Baugh Chemical Co., Baltimore, Md. Stock of Farmers' Exchange, Meriden.

12951. Sold by Wilcox Fertilizer Co., Mystic. Stock of M. E. Thompson, Ellington.

12723. Sold by L. T. Frisbie Co., New Haven. Stock of F. S. Platt Co., New Haven.

12561. Sold by Sanderson Fertilizer & Chemical Co., New Haven. Sampled at factory.

12802. Sold by Coe-Mortimer Co., New York City. Stock of Conyers Farm, Greenwich.

12969. Sold by National Fertilizer Co., New York City. Stock of W. L. Thorpe, North Haven.

12558. Sold by Apothecaries Hall Co., Waterbury. Sampled at factory.

12736. Sold by Bowker Fertilizer Co., New York City. Stock of C. G. Lawton, Brooklyn, Conn.

12563. Sold by F. S. Royster Guano Co., Baltimore, Md. Stock of F. E. Beach, Branford.

12557. Sold by American Agricultural Chemical Co., New York City. Stock of D. L. Clark & Son, Milford.

12733. Sold by Armour Fertilizer Works, Chrome, N. J. Stock of Quality Seed Store, Stamford.

12712. Sold by Coe-Mortimer Co., New York City. Stock of Gunther Bros., Rockville.

12559. Sold by American Agricultural Chemical Co., New York City. Stock of W. J. Lobdell, Stratford.

12609. Sold by American Agricultural Chemical Co., New York City. Stock of E. H. Latimer & Son, Southington.

12810. Sold by Nitrate Agencies Co., New York City. Stock of A. F. Brinckeroff, Georgetown, Conn.

12689. Sold by Sanderson Fertilizer and Chemical Co., New Haven. Sent by J. L. Watrous, Middlefield.

ANALYSES OF ACID PHOSPHATE.

Station No.	Water-soluble phosphoric acid.	Citrate-soluble phosphoric acid.	Citrate-insoluble phosphoric acid.	Total phosphoric acid.	"Available" phosphoric acid found.	"Available" phosphoric acid guaranteed.	Cost per ton.	"Available" phosphoric acid cost cents per pound.
12669	12.79	2.74	1.39	16.92	15.53	16.00	\$24.75	7.9
12951	15.48	2.39	0.14	18.01	17.87	16.00	31.00	8.6
12723	14.82	3.04	0.13	17.99	17.86	16.00	32.00	8.9
12561	13.53	3.17	0.38	17.08	16.70	16.00	30.00	8.9
12802	12.48	3.62	1.55	17.65	16.10	16.00	31.50	9.7
12969	14.14	2.30	1.65	18.09	16.44	16.00	34.00	10.3
12558	10.68	3.37	0.14	14.19	14.05	14.00	30.00	10.6
12736	11.88	2.88	1.42	16.18	14.76	14.00	32.00	10.7
12563	10.63	4.70	1.34	16.67	15.33	16.00	33.00	10.7
12557	11.18	2.97	1.48	15.63	14.15	14.00	30.69	10.8
12733	13.99	2.84	0.06	16.89	16.83	16.00	40.00	11.8
12712	11.85	4.76	1.36	17.97	16.61	14.00	31.50	13.5
12559	12.31	3.22	1.92	17.45	15.53	16.00	30.00	14.2
12609	13.45	2.72	1.43	17.60	16.17	16.00	....	....
12810	13.57	2.54	2.02	18.13	16.11	16.00	....	....
12689	14.14	3.52	0.43	18.09	17.66	16.00	....	....

The cost of available phosphoric acid in this form has ranged from 7.9 to 14.2 cents per pound, an average of 10.5 cents. It has cost about one cent a pound more in the 14 per cent. goods than in the 16 per cent.

The average prices given in our reports for the last 8 years are as follows:

1912	5.6 cents
1913	4.7
1914	4.65
1915	3.99
1916	6.7
1917	6.2
1918	7.9
1919	10.5

The price of acid phosphate has advanced almost to prohibitive prices in spite of the fact that oil of vitriol, which combined with lime makes up about half the weight of acid phosphate, has declined in price since the armistice. Various contributing causes have been brought forward to explain the facts: The increased cost of labor and of freight, the scarcity of shipping to bring the rock to northern factories, a strike at the phosphate mines which has for a time stopped the output of rock phosphate, car shortage and the indisposition of manufacturers to sell farmers anything other than ready mixed fertilizers at a reasonable price. The practice of selling acid phosphate on condition that a certain amount of mixed fertilizer is sold with it is an unfair and illegal practice under the laws at present in force.

The effect of this situation is, in our judgment, to increase the sales of raw phosphates, ground apatite mixed with barium sulphide, Tennessee floats and fine ground soft Florida rock, rather than to increase the use of factory mixed goods, and to the trial of all possible home mixtures to increase the availability of these slower acting forms of phosphoric acid.

From the preceding discussion we may put together the approximate cost per pound of phosphoric acid in those articles in which phosphoric acid is the chief fertilizing ingredient.

Total phosphoric acid

In barium-phosphate	5.7-7.5
Florida soft phosphate	9.1

Available phosphoric acid

Acid phosphate	10.5
Basic lime phosphate	8.7-9.8
Precipitated bone phosphate	8.0

At these prices certainly precipitated bone phosphate has been the best purchase, price and fertilizing value considered.

Considering the relative cost of "available" phosphoric acid and the two forms of less soluble phosphoric acid, it is quite certain that on our light humus-poor soils and for the variety of crops generally grown in the state the more soluble forms at present prices are preferable.

III. RAW MATERIALS OF HIGH GRADE CONTAINING POTASH.

COTTON HULL ASHES.

Three samples were analyzed as follows:

12480. Sold by Olds & Whipple, Hartford. Stock of John Wolf, Windsor. Cost \$6 per unit of water-soluble potash, equivalent to 30 cents per pound for actual potash. It contained 29.30 per cent. potash.

12654. Sold by Olds & Whipple, Hartford. Stock of John Wolf, Windsor. Cost \$6 per unit of water-soluble potash, equivalent to 30 cents per pound for actual potash. It contained 19.10 per cent. of potash.

12902. Sold by Olds & Whipple, Hartford. Stock of New England Tobacco Corp., John Wolf, manager, Windsor. Cost \$4 per unit of water-soluble potash, equivalent to 20 cents per pound for actual potash. It contained 25.70 per cent. of potash.

Sample **12480** was sold in March. The price of **12902**, sold by the same firm three months later, reflects the falling price of potash.

POTASH SALTS.

The following analyses show the composition of potash salts from various sources, probably all of them American. They were not taken from stock on sale in this state, but were contributed chiefly by Prof. Whitney, chief of the U. S. Bureau of Soils:

	Per cent. of water-soluble potash.
12438 Muriate of potash from kelp	60.08
12440 Kelp ash	36.72
12439 Searles Lake ("Trona Potash")	31.98
12442 Nebraska potash	26.20
12441 Potash extracted from green sand marl	53.80
12443 Potash from blast furnace	12.28 ¹
12444 Cement flue blast furnace	11.30 ²
12445 Molasses residue	38.06 ³

¹ Total potash 20.46.

² Total potash 12.76.

³ 20.14 per cent. as muriate, 12.42 as sulphate, 5.51 as carbonate.

The Searles Lake potash contains borax in considerable amount. A very large amount of borax in a fertilizer may cause injury or ruin to crops. The U. S. Department of Agriculture, acting under authority conferred during the war, has ordered manufacturers not to sell fertilizers containing more than 0.1 per cent. borax without plainly showing the amount of borax on the containers.

The following samples were taken in the Connecticut market:

12485. American Potash. Sent by Prof. W. L. Slate, Jr., Storrs, Conn. It contained 52.36 per cent. of potash.

12509. Antioch Nebraska Potash. It contained 22.18 per cent. of which 4.41 per cent. was muriate and 17.77 per cent. sulphate.

OTHER MATERIALS CONTAINING POTASH.

12029. Alpha Potash-Lime Fertilizer. Made by Alpha Portland Cement Co., Easton, Pa. Sent by E. N. Austin, Suffield. It contained 2.33 per cent. of potash and 25.92 per cent. of lime. Cost \$13 per ton.

12568. Alpha Potash-Lime Fertilizer. Made by Alpha Portland Cement Co., Easton, Pa. Stock of Louis H. Porter, Stamford. Guaranteed 2.50 per cent. potash. It contained 2.17 per cent. potash. Cost \$12 per ton.

If potash is valued at 30 cents per pound, the price current in the spring of 1919, the valuation of the potash alone about covers the cost of the fertilizer.

Wood ashes have been used considerably as a source of potash on the tobacco crop being bought at \$6 to \$6.30 per unit of potash which is equivalent to 30 to 32½ cents per pound. Analyses of wood ashes are given on later pages of this report.

NITRAPO.

With the potash salts may be classed this material, offered by the Nitrate Agencies Co. of New York City. It is stated to be a product of refineries in Chili.

12703. Sent by the Hartford county agricultural agent. It contains 14.52 per cent. of nitrogen and 19.94 per cent. of potash. It contains less than one-half per cent. of chlorine and no borax. The price quoted is \$175 per ton in New York. Allowing 31½ cents per pound for nitrogen the potash costs 41.3 cents per pound or \$8.26 per unit.

IV. CONTAINING NITROGEN AND PHOSPHORIC ACID.

FISH MANURES.

Fifteen analyses of this material appear in the table. In only one, 12841, is the nitrogen less than was guaranteed but four failed to meet the guaranty of phosphoric acid.

13509 is fish bought in the previous year.

The six other samples of which the prices are given and the composition is normal have the following average composition:

Nitrogen	8.36
"Available" phosphoric acid	7.45
Insoluble phosphoric acid	3.04
Cost per ton	\$101.00

If the "available" phosphoric acid is valued at 10½ cents per pound, its cost in acid phosphate, and the insoluble phosphoric acid at 4 cents, the average cost of nitrogen in fish manures has been about 49.6 cents per pound.

ANALYSES OF

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.
	<i>Sampled by Station:</i>	
12731	American Agr. Chem. Co.	Jacob Lang, Windsor
12672	Apothecaries Hall Co.	H. B. Cornwall, Meriden
12692	Berkshire Fertilizer Co.	Max Lavitt, Ellington
12720	L. T. Frisbie Co.	Frisbie Branch, Hartford
12863 ¹	A. L. Koster, Suffield	Am. Sumatra Tob. Co., Win. Locks
12968 ²	A. L. Koster, Suffield	Michael Cannon, Ellington
13509	Russia Cement Co., Boston	Griffin Tobacco Co., Bloomfield ..
12923	Olds & Whipple	Manufacturer
12943	Va.-Car. Chemical Co.	S. J. Stevens, Glastonbury
	<i>Sampled by Purchaser:</i>	
12755	A. Manning, South Manchester..	Jos. Prekop, West Suffield
12470	.....	E. J. Eaton, New London
12601	A. W. Higgins, S. Deerfield, Mass.	Aaron Dobkin, Ellington
12841	A. L. Koster, Suffield	Fassler & Silberman, Hartford ...
12423	.....	Am. Sumatra Tob. Co., E. Hartford
12666	.....	L. J. Prior, East Hartford

¹ Chlorine 0.24.² Chlorine 0.15.

SLAUGHTER HOUSE TANKAGE.

Of the seven samples drawn by the station six represent products low in nitrogen. (*For analyses see page 70.*)

The three samples from Meriden, made by C. M. Shay Co., are much below their guaranty of nitrogen.

If the phosphoric acid in these samples is valued at 6 cents, the average cost of nitrogen is about 42.1 cents. If on the other hand nitrogen is reckoned worth 49.6 cents per pound, as in fish scrap, the phosphoric acid costs 4.1 cents.

MIXED BONE AND TANKAGE.

12978. Listers Celebrated Ground Bone and Tankage Acidulated, made by Listers Agricultural Chemical Works, Newark, N. J. From stock of G. C. Neal, Hamden. (*For analysis see page 70.*)

FISH MANURES.

Nitrogen.				Phosphoric acid.			Total phosphoric acid.		Cost per ton.
As ammonia.	As organic.	Total found.	Total guaranteed.	Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Found.	Guaranteed.	
0.37	5.97	6.34	5.76	0.40	3.92	0.95	5.27	5.50	.....
0.10	8.15	8.25	8.20	0.23	8.09	5.37	13.69	5.50	\$100.00
0.25	7.38	7.63	7.40	0.64	6.16	0.91	7.71	7.00	105.00
0.21	8.12	8.33	7.41	0.27	5.89	1.34	7.50	14.00	90.00
0.12	8.42	8.54	8.23	0.29	3.02	0.55	3.86	5.00	.....
....	....	8.38	8.23	0.31	2.02	0.82	3.15	5.00	.....
0.10	7.95	8.05	....	0.51	8.23	7.01	15.75	....	50.00
0.13	8.03	8.16	8.23	0.42	7.19	4.43	12.04	5.50	110.00
0.12	9.14	9.26	8.20	0.45	5.47	1.32	7.24	2.00	100.00
0.60	4.77	5.37	....	0.62	6.80	3.22	10.64	10.00	70.00
0.10	9.84	9.94	....	0.63	1.04	0.52	2.19	....	.....
0.12	8.39	8.51	7.00	0.36	9.54	4.84	14.74	16.00	100.00
....	....	7.38	8.23	0.28	3.59	0.83	4.70	5.00	.....
0.12	8.69	8.81	....	0.51	5.02	1.80	7.33	....	.....
0.05	7.10	7.15	....	0.63	6.93	7.36	14.92	....	.....

ANALYSES OF

Station No.	Manufacturer.	Dealer or Purchaser.
	<i>Sampled by Station:</i>	
12670	Apothecaries Hall Co.	H. B. Cornwall, Meriden
12735	Armour Fertilizer Works	Quality Seed Store, Stamford
12671	F. O. Brown, Leonards Bridge ..	Meriden Farmers' Exchange
12719	Conn. Fat Rend. & Fertz. Co.	Manufacturer
12790	C. M. Shay Co.	Peter Levine, Meriden
13367	C. M. Shay Co.	Chas. T. Kinney, Meriden
13368	C. M. Shay Co.	W. T. Rice, South Meriden
	<i>Sampled by Purchaser:</i>	
12431	Allison Bros., Middletown	Raymond J. Harris, Middletown..
12676	.....	Rhett Fletcher, Mount Carmel ...

PERCENTAGE COMPOSITION OF MIXED BONE AND TANKAGE.

Total nitrogen found	2.53
Total nitrogen guaranteed	2.67
Total phosphoric acid found	10.98
Total phosphoric acid guaranteed	12.00
Finer than 1-50	62.00
Coarser than 1-50	38.00

BONE MANURES.

(ANALYSES ON PAGE 72.)

All of the sixteen brands examined substantially meet their guaranties. In twelve brands more than 50 per cent. of the bone was finer than 1-50 inch.

The average cost of all the brands was \$58.27 per ton. If nitrogen is given a value of 49.6 cents a pound, as in cotton seed meal, a pound of phosphoric acid cost 5.2 cents.

If phosphoric acid is valued at 6 cents, nitrogen costs 43.8 cents.

Following is a statement of the *approximate* average prices which have been paid in this state for nitrogen, phosphoric acid and potash during the spring of 1919.

SLAUGHTER HOUSE TANKAGE.

Nitrogen.				Phosphoric acid.		Mechanical analysis.		Cost per ton.
As ammonia.	As organic.	Total found.	Total guaranteed.	Found.	Guaranteed.	Finer than 1.50 inch.	Coarser than 1.50 inch.	
0.18	3.72	3.90	3.29	21.77	20.00	42.0	58.0	\$55.00
0.25	7.30	7.55	7.40	7.77	6.87	41.0	59.0	80.00
0.13	5.32	5.45	4.92	15.67	14.00	37.0	63.0	57.00
0.31	2.82	3.13	3.00	22.85	20.00	58.0	42.0	45.00
0.34	3.14	3.48	5.00	19.32	15.00	55.0	45.0	57.00
0.37	3.64	4.01	5.00	17.09	16.00	49.0	51.0	....
0.30	3.52	3.82	5.00	18.48	16.00	57.0	43.0	....
0.12	6.72	6.84	....	12.29	....	45.0	55.0	45.00
....	....	3.78	....	22.90	....	62.0	38.0	....

Cents per pound.

Nitrogen in nitrate of soda, 29 to 35	31.5
sulphate of ammonia	23.9
cotton seed meal	40.5
castor pomace	47.1
fish	49.6
tankage	42.1
bone	43.8
Total phosphoric acid in ground apatite	5.7 to 7.5
Florida rock	9.1
Available phosphoric acid in precipitated bone	8.0
basic lime phosphate	8.7 to 9.8
acid phosphate	10.5
Potash in cotton hull ashes	30.0
wood ashes	30 to 32.5
from cement manufacture	24 to 28
in "Nitrapo"	41.3

V. MIXED FERTILIZERS.

NITROGENOUS SUPERPHOSPHATES WITHOUT POTASH.

In a following table are 166 analyses representing nearly all the brands of this class offered for sale in this state in 1919.

ANALYSES OF

Station No.	Manufacturer and Brand.	Dealer or Purchaser.
	<i>Sampled by Station:</i>	
12985	Am. Agr. Chem. Co., Fine Ground Bone	W. C. Mansfield, North Haven ...
12984	Amer. Agr. Chem. Co., High Grade Ground Bone	J. A. Glasnapp, West Cheshire ...
12983	Armour Fertz. Works, Bone Meal	F. S. Bidwell & Co., Wind. Locks
12982	Berkshire Fertz. Co., Ground Bone	Max Lavitt, Ellington
12981	Coe-Mortimer Co., Fine Ground Bone..	J. P. Barstow & Co., Norwich
12980	L. T. Frisbie Co., Fine Bone Meal	F. S. Platt & Co., New Haven
12979	Listers Agr. Chem. Works, Bone Meal	Paul Lanz, Rockville
12974	Pawtucket Ren. Co., Pure Ground Bone	A. D. Briggs, Pomfret
12880	Rogers & Hubbard Co., Pure Raw Knuckle Bone Flour	Cadwell & Jones, Hartford
12967	Rogers & Hubbard Co., Strictly Pure Fine Bone	David Bros., Durham
12977	F. S. Royster Guano Co., Fine Ground Bone Meal	Silliman Hdw. Co., New Canaan ..
12976	Sanderson Fertz. & Chem. Co., Fine Ground Bone	Manufacturer
12934	M. L. Shoemaker & Co., Swift Sure Bone Meal	Olds & Whipple, Hartford
12434	Springfield Ren. Co., Fine Ground Bone	G. S. Phelps & Co., Thompsonville
12469	Van Iderstine Co., Pure Ground Bone..	E. B. Clark Seed Co., Milford
12975	Worcester Rend. Co., Royal Worcester Pure Fine Ground Bone	F. M. Cole, Putnam

COMPOSITION AND COST OF THE BRANDS.

In almost all cases excepting those having 4.11 per cent. of nitrogen (5 per cent. ammonia) or more, either 8 or 10 per cent. of available phosphoric acid is guaranteed.

13 samples have a guaranty of .82 per cent. nitrogen.

21	"	"	"	"	"	1.65	"	"
23	"	"	"	"	"	2.47	"	"
26	"	"	"	"	"	3.29	"	"
36	"	"	"	"	"	4.11	"	"
8	"	"	"	"	"	5.53	"	"
9	"	"	"	"	still higher nitrogen guaranty.			
30	"	unclassified.						

BONE MANURES.

Nitrogen.		Phosphoric acid.		Mechanical analysis.		Cost per ton.
Found.	Guaranteed.	Found.	Guaranteed.	Finer than 1.50 inch.	Coarser than 1.50 inch.	
3.43	2.47	24.51	22.89	65.0	35.0	.....
3.38	3.29	23.08	20.50	70.0	30.0	\$56.00
2.80	2.47	25.07	22.00	60.0	40.0	59.00
3.76	3.30	22.34	20.00	36.0	64.0	60.50
2.67	2.47	22.26	22.35	59.0	41.0	58.00
3.25	2.46	23.85	20.00	32.0	68.0	55.00
3.78	2.47	23.56	23.00	64.0	36.0	56.50
3.05	2.47	25.25	23.00	64.0	36.0	48.00
3.90	3.82	25.28	24.70	68.0	32.0	70.00
3.58	3.29	22.06	20.59	58.0	42.0	62.00
2.47	2.47	24.36	22.90	51.0	49.0	59.00
3.06	2.47	25.07	22.00	49.0	51.0	50.00
5.20	5.14	23.69	20.88	74.0	26.0	66.50
3.36	2.46	25.23	23.00	65.0	35.0	54.00
2.26	2.00	28.86	27.00	48.0	52.0	.....
3.41	2.47	22.06	23.00	57.0	43.0	53.00

Comparing brands containing the same amount of available phosphoric acid but different amounts of nitrogen, it is possible to approximately determine the average cost price of nitrogen. Thus 11 brands with 10 per cent. available phosphoric acid contain 0.82 per cent. and cost \$41.14; 19 contain 1.65 nitrogen and cost \$49.77; .82 per cent. or 16.4 lbs. of nitrogen in the ton cost \$49.77 — \$41.14 = \$8.63 ÷ 16.4 = 52 cents per pound for nitrogen. Rising from a guaranty of 1.65 per cent. nitrogen to 2.47 per cent., nitrogen costs 32.3 cents. Rising from 2.47 per cent. to 3.29 per cent., nitrogen costs 36.4 cents.

It is clear, as has always been contended by the station, that the higher grade fertilizers, notwithstanding their higher price, are the more economical.

GUARANTIES.

Fifteen samples contained less nitrogen than was guaranteed, and 12 contained less phosphoric acid.

In most cases, however, the money value of the deficiency in one ingredient was made good by an overrun in the other.

Eight samples failed to thus make good by the amounts given below, valuing nitrogen at 45 cents per pound and available phosphoric acid at 10 cents.

12959	Bradley's Special Potato Manure	\$2.42
12916	Armour's Special Tobacco Grower	1.91
12715	Coe-Mortimer's Top Dressing Manure, 1916	2.13
12534	Lowell Potato Phosphate	2.83
12835	Mapes General Crop, 1916	2.58
12843	National Nitrogen Phosphate Mixture No. 5 ...	4.83
12776	Royster's Landmark Ammoniated Phosphate ...	5.14
12925	Royster's Penguin Ammoniated Phosphate	1.31

But of Armour's Special Tobacco Grower, a second sample which fully met its guaranty was drawn from another source.

A second sample of Coe-Mortimer's Top Dressing Manure 1916 was also found to meet its guaranty. The same is true of Royster's Penguin Ammoniated Phosphate as appears from the analysis in the table.

QUALITY OF THE NITROGEN.

The solubility of the water-insoluble nitrogen in all factory mixtures has been determined by the permanganate methods of Jones and Street. In the following brands the presence of inferior forms of nitrogen was indicated by both methods:

12520	Atlantic Packing Co.'s Grain Fertilizer.
12783	Berkshire Fertilizer Co.'s Grass Special.
12612	Berkshire Fertilizer Co.'s Potato and Vegetable Phosphate.
12597	Berkshire Fertilizer Co.'s Root Fertilizer.
12717	Coe-Mortimer Co.'s Tobacco Special.
12531	Lowell Fertilizer Co.'s Potato Manure.
12849	New England Fertilizer Co.'s Corn and Grain Fertilizer.
12848	New England Fertilizer Co.'s Standard Phosphate.
13031	Rogers & Hubbard Co.'s Bone Base Soluble Corn and General Crops.

The Berkshire Fertilizer Co. explains that their formulas were calculated to furnish the full amount of nitrogen necessary to meet their guaranties in available form *without counting the nitrogen in garbage tankage* which was added as a conditioner or dryer. To such use of garbage tankage or other conditioner no objection is made, but in these cases the formulas did not meet the guaranties without counting in the inferior nitrogen of the conditioner.

ANALYSES NEEDING SPECIAL NOTICE.

12700, Atlantic Packing Co.'s Tobacco Special was below guaranty in nitrogen and far above it in available phosphoric acid. The manufacturer objected that this did not fairly represent the composition of this brand. A second sample of this brand was therefore drawn and analyzed, 12953, which fully met the guaranty.

12778, the above firm's Top-Dresser, was deficient in nitrogen. The manufacturer showed that this was stock carried over from the previous season. Another sample, representing the present season's output, 12986, also showed a slight deficiency of nitrogen.

13156, Coe-Mortimer's Top-Dressing Manure, 1916, being found deficient in available phosphoric acid, a portion of our sample was sent to the manufacturer's chemist whose analysis differs from ours in these respects:

	Station figures.	Manufacturer's figures.
Available phosphoric acid	7.33	7.74
Total phosphoric acid	8.55	9.08

Frequently manufacturers have called for portions of our samples for their own test, but in all other cases so far as reported their results and ours have substantially agreed. We cannot explain the discrepancy in this case.

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.
<i>Sampled by Station:</i> American Agricultural Chem. Co., New York City.		
12591	Ammoniated Fertilizer A	Milford
12590	Ammoniated Fertilizer AA	Milford
12756	Ammoniated Fertilizer AAA	Milford
12592	Ammoniated Fertilizer AAAA	Southport
12955	Complete Tobacco Manure without Potash	Ellington
12511	5-8 Fertilizer	New Haven
12957	Odorless Grass and Lawn Top Dressing without Potash	Ellington
12757	Odorless Grass and Lawn Top Dressing without Potash	Stafford Springs
12956	Special Vegetable Fertilizer	Ellington
12593	Tobacco Special	Glastonbury
12644	Bradley's Grain Fertilizer	Putnam
12759	Bradley's Root Crop Manure	Groton
12645	Bradley's Special Corn Phosphate without Potash	Norwich
12959 ¹	Bradley's Special Potato Manure without Potash	Groton
12646	Bradley's Special Potato Fertilizer without Potash	Groton
12512	Bradley's Tobacco Manure without Potash	Suffield
12763	East India Tobacco Special without Potash	Gaylordsville
12648	Quinnipiac Special Corn Manure without Potash	New London
12766	Quinnipiac Special Potato Phosph. without Potash	New London
12767	Quinnipiac Wrapper Leaf Brand Manure without Potash	Hazardville
12912	Williams and Clark's Seed Leaf Tobacco Manure without Potash	South Manchester
12910	Williams and Clark's Special Americus Corn Phosphate without Potash	Ellington
12911	Williams and Clark's Special Americus Potato Manure without Potash	Ellington
Apothecaries Hall Co., Waterbury, Conn.		
12698	Liberty Corn, Fruit and All Crops	Windsorville
12699	Liberty Market Gardeners' Special	Windsorville
12779	Liberty Potato and Vegetable Special	Windsorville
12780	Liberty Tobacco Special	Windsorville
12954	Liberty Tobacco Special	Windsorville
12594	Liberty Top Dresser for Grass and Grain	Milldale
Armour Fertilizer Works, Chrome, N. J.		
12916 ¹	Special Tobacco Grower No. 2	South Manchester
13157	Special Tobacco Grower No. 2	Agawam, Mass.
12611	2-10-0	Rockville
12516	4-10-0	Windsor Locks

¹ See note, page 74.

WITHOUT POTASH.

Dealer's cash price per ton.	Nitrogen.				Phosphoric Acid.				So-called "Available."		Station No.			
	In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.				
					Found.	Guaranteed.				Found.		Guaranteed.		
\$36.00	0.14	0.15	0.11	0.74	1.14	0.82	7.20	3.86	0.93	11.99	11.00	11.06	10.00	12591
43.95	....	0.56	0.19	1.00	1.75	1.65	7.58	2.88	1.02	11.48	11.00	10.46	10.00	12590
55.00	....	1.12	0.34	1.14	2.60	2.47	8.94	2.11	0.83	11.88	11.00	11.05	10.00	12756
58.00	1.29	0.94	0.34	0.87	3.44	3.29	8.38	2.17	0.86	11.41	11.00	10.55	10.00	12592
....	1.07	0.08	0.06	3.40	4.61	4.53	1.10	3.45	0.27	4.82	4.00	4.55	3.00	12955
....	0.93	1.90	0.14	1.12	4.09	4.11	7.10	1.54	0.79	9.43	9.00	8.64	8.00	12511
....	1.49	1.34	0.13	1.34	4.30	4.11	6.31	3.46	1.33	11.10	11.00	9.77	10.00	12957
70.00	1.80	1.22	0.29	0.77	4.08	4.11	6.70	3.26	1.43	11.39	11.00	9.96	10.00	12757
....	1.07	1.14	0.07	1.15	3.43	3.29	6.34	3.60	1.42	11.36	11.00	9.94	10.00	12956
....	0.99	0.24	0.04	3.08	4.35	4.11	1.34	4.36	0.35	6.05	5.00	5.70	4.00	12593
39.00	....	0.36	0.14	0.54	1.04	0.82	6.12	3.64	0.90	10.66	11.00	9.76	10.00	12644
66.00	0.92	1.46	....	1.07	3.45	3.29	7.25	3.06	1.22	11.53	11.00	10.31	10.00	12759
50.00	0.27	0.63	....	0.91	1.81	1.65	6.15	4.43	1.32	11.90	11.00	10.58	10.00	12645
57.00	0.34	0.78	0.10	0.97	2.19	2.47	6.54	3.51	1.05	11.10	11.00	10.05	10.00	12959
50.00	0.05	0.65	0.17	0.90	1.77	1.65	5.92	4.34	1.47	11.73	11.00	10.26	10.00	12646
75.00	1.04	0.17	....	3.25	4.46	4.53	0.68	4.26	0.38	5.32	4.00	4.94	3.00	12512
70.00	0.81	0.36	0.24	3.05	4.46	4.53	0.98	3.88	0.50	5.36	4.00	4.86	3.00	12763
50.00	0.09	0.63	0.07	1.01	1.80	1.65	6.59	4.05	0.77	11.41	11.00	10.64	10.00	12648
52.00	0.15	0.63	0.05	0.98	1.81	1.65	7.02	3.88	0.87	11.77	11.00	10.90	10.00	12766
72.00	0.93	0.07	0.08	3.49	4.57	4.53	1.73	3.31	0.22	5.26	4.00	5.04	3.00	12767
73.00	0.85	0.44	0.12	3.29	4.70	4.53	0.89	4.21	0.51	5.61	4.00	5.10	3.00	12912
46.00	....	0.85	0.21	0.81	1.87	1.65	5.52	4.42	2.43	12.37	11.00	9.94	10.00	12910
46.75	0.14	0.81	0.03	0.78	1.76	1.65	5.62	4.53	2.48	12.63	11.00	10.15	10.00	12911
....	0.11	0.15	0.36	1.38	2.00	1.65	6.91	2.65	0.41	9.97	11.00	9.56	10.00	12698
60.00	....	1.31	0.62	1.57	3.50	3.29	8.99	2.05	0.63	11.67	11.00	11.04	10.00	12699
....	....	0.73	0.52	1.38	2.63	2.47	8.35	2.18	0.31	10.84	11.00	10.53	10.00	12779
72.00	0.25	2.00	....	1.61	3.86	4.11	3.41	1.66	0.24	5.31	5.00	5.07	4.00	12780
....	0.27	2.01	....	1.74	4.02	4.11	3.35	1.56	0.31	5.22	5.00	4.91	4.00	12954
72.00	1.89	1.71	0.22	1.08	4.90	4.94	6.94	1.68	0.28	8.90	9.00	8.62	8.00	12594
71.00	0.79	0.09	0.10	2.64	3.62	4.11	3.02	2.23	2.48	7.73	4.50	5.25	4.00	12916
....	0.29	2.06	1.78		4.13	4.11	2.94	2.07	0.17	5.18	4.50	5.01	4.00	13157
50.00	0.16	0.81	0.09	0.65	1.71	1.65	6.37	3.04	1.54	10.95	10.50	9.41	10.00	12611
63.00	0.24	1.60	0.22	1.23	3.29	3.29	8.05	2.18	0.95	11.18	10.50	10.23	10.00	12516

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.
<i>Sampled by Station:</i>		
Atlantic Packing Co., New Haven, Conn.		
12520 ¹	Grain Fertilizer	New Haven
12519	Potato Phosphate	New Haven
12701	Special Vegetable	New Haven
12700 ²	Tobacco Special (C. S. Meal)	South Windsor
12953	Tobacco Special (C. S. Meal)	Burnside
12778 ²	Top Dresser	New Haven
12986 ²	Top Dresser	Factory
Berkshire Fertilizer Co., Bridgeport, Conn.		
12690	Ammoniated Bone Phosphate	Norwichtown
12783 ¹	Grass Special	Ellington
12613	Market Garden Fertilizer	Ellington
12612 ¹	Potato and Vegetable Phosphate	Centerbrook
12597 ¹	Root Fertilizer	Wethersfield
12691	Tobacco Grower	Ellington
12784	Tobacco Starter	Suffield
F. E. Boardman, Middletown, Conn.		
12808	Fertilizer for General Crops	Factory
Bowker Fertilizer Co., New York City.		
12696	Four Ten Hill and Drill	Willimantic
12693	One Ten Sure Crop	Yantic
12787	Superphosphate with Ammonia 1%	Terryville
12522	Superphosphate with Ammonia 2%	Yalesville
12598	Superphosphate with Ammonia 3%	Plainville
12695	Superphosphate with Ammonia 4%	Yalesville
12786	Superphosphate with Ammonia 5%	Simsbury
12614	Three Ten All Round	Rockville
12435	Tobacco Grower 1916	Thompsonville
12694	Two Ten Farm and Garden	Norwich
F. O. Brown, Leonard's Bridge, Conn.		
12806	Vegetable and Potato Grower	Farmington
12807	Oats and Top Dressing	Farmington
E. D. Chittenden Co., Bridgeport, Conn.		
12804	Complete Tobacco and Onion Grower without	Enfield
12600	Potash	Greens Farms
12600	Vegetable and Onion Grower without Potash	Greens Farms
E. B. Clark Seed Co., Milford, Conn.		
12711	Special Mixture for General Use	Factory

¹ See note, page 74.² See note, page 75.

WITHOUT POTASH—(Continued).

Dealer's cash price per ton.	Nitrogen.						Phosphoric Acid.						Station No.	
	In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		So-called "Available."		
					Found.	Guaranteed.				Found.	Guaranteed.	Found.		Guaranteed.
\$45.75	0.19	0.74	0.28	0.49	1.70	1.64	7.25	3.60	0.50	11.35	11.00	10.85	10.00	12520
53.50	....	0.96	0.61	0.85	2.42	2.46	6.55	3.92	0.79	11.26	11.00	10.47	10.00	12519
63.00	1.23	0.25	0.83	1.00	3.31	3.26	5.81	5.31	2.41	13.53	11.00	11.12	10.00	12701
65.20	1.15	0.08	0.96	1.65	3.84	4.10	3.91	4.63	1.57	10.11	7.00	8.54	6.00	12700
....	1.07	0.14	1.06	1.83	4.10	4.10	3.01	4.93	2.24	10.18	8.00	7.94	6.00	12953
67.75	0.73	1.87	0.42	0.88	3.90	4.10	5.56	3.35	0.52	9.43	9.00	8.91	8.00	12778
....	0.71	1.14	0.99	1.14	3.98	4.10	5.69	3.49	0.70	9.88	9.00	9.18	8.00	12986
40.00	0.03	0.59	0.10	0.37	1.09	0.80	4.65	5.63	0.79	11.07	11.00	10.28	10.00	12690
....	3.15	1.07	0.04	0.48	4.74	5.00	4.09	1.56	0.38	6.03	5.00	5.65	4.00	12783
....	0.74	1.50	0.14	0.96	3.34	3.30	7.84	1.87	0.49	10.20	9.00	9.71	8.00	12613
52.00	....	0.86	0.35	0.59	1.80	1.70	2.88	8.70	1.15	12.73	11.00	11.58	10.00	12612
50.75	1.08	0.90	0.15	0.48	2.61	2.50	3.70	4.66	0.63	8.99	9.00	8.36	8.00	12597
....	0.83	0.98	0.24	1.86	3.91	4.11	1.82	2.83	0.28	4.93	4.00	4.65	3.00	12691
....	2.45	0.62	0.60	1.35	5.02	5.00	3.05	1.93	0.28	5.26	5.00	4.98	4.00	12784
57.00	0.69	1.35	0.33	0.91	3.28	3.29	4.91	3.03	0.54	8.48	....	7.94	7.00	12808
52.00	0.84	1.48	0.16	1.02	3.50	3.29	7.31	2.87	1.27	11.45	11.00	10.18	10.00	12696
39.00	....	0.32	0.13	0.58	1.03	0.82	6.51	3.89	0.81	11.21	11.00	10.40	10.00	12693
46.00	....	0.03	0.34	0.46	0.83	0.82	7.04	3.30	1.25	11.59	11.00	10.34	10.00	12787
51.00	....	0.44	0.32	0.89	1.65	1.65	7.10	2.93	1.61	11.64	11.00	10.03	10.00	12522
57.00	....	0.85	0.39	1.27	2.51	2.47	8.78	2.01	0.65	11.44	11.00	10.79	10.00	12598
70.00	0.90	1.46	....	1.02	3.38	3.29	8.19	1.97	0.97	11.13	11.00	10.16	10.00	12695
....	0.30	1.44	0.83	1.67	4.24	4.11	4.03	4.32	2.60	10.95	9.00	8.35	8.00	12786
55.00	....	1.15	0.37	1.11	2.63	2.47	8.74	1.71	1.41	11.86	11.00	10.45	10.00	12614
71.00	1.01	....	0.11	3.15	4.27	4.11	1.10	4.74	0.28	6.12	5.00	5.84	4.00	12435
54.00	0.64	0.13	0.19	0.72	1.68	1.65	2.21	7.89	2.01	12.11	11.00	10.10	10.00	12694
57.00	0.61	0.85	0.58	0.86	2.90	2.87	7.07	3.93	0.82	11.82	11.00	11.00	10.00	12806
....	0.80	0.95	1.23	1.40	4.38	4.10	5.50	3.61	0.57	9.68	9.00	9.11	8.00	12807
66.50	1.95	1.23	0.03	0.40	3.61	3.29	6.60	3.93	1.62	12.15	11.00	10.53	10.00	12804
57.00	0.65	1.25	0.08	0.57	2.55	2.46	7.25	3.23	1.29	11.77	11.00	10.48	10.00	12600
56.00	0.07	2.21	0.27	1.20	3.75	3.25	8.92	2.86	1.41	13.19	12.00	11.78	10.00	12711

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.
<i>Sampled by Station:</i>		
The Coe-Mortimer Co., New York City.		
12714	Excelsior Potato Fertilizer 1916	Greenwich
12524	High Grade Ammoniated Superphosphate 1916 ...	Milford
12713	Prolific Crop Producer 1916	Abington
12717 ¹	Tobacco Special	Rockville
12715 ¹	Top Dressing Manure 1916	Poquonock
13156 ²	Top Dressing Manure 1916	Somerville
The Essex Fertilizer Co., Boston, Mass.		
12638	Fish Fertilizer	Rockville
12615	Grain, Grass and Potato Fertilizer	South Manchester
12811	Market Garden	North Haven
12799	Potato Phosphate	Hartford
12812	Special Tobacco 5-4	Rockville
12853	Tobacco Manure 5-6	Granby
The L. T. Frisbie Co., New Haven, Conn.		
12525	Connecticut Special for All Crops	Meriden
12721	Corn and Grain Fertilizer	New London
12860	One Ten	Norwich
12616	Market Garden and Top Dresser	Rockville
12526	Potato and Vegetable Grower	Guilford
12569	Tobacco Special	Glastonbury
International Agricultural Corp., Buffalo, N. Y.		
12814	Buffalo Farmers' Choice	Moosup
12820	Buffalo Garden Truck	West Cheshire
12816	Buffalo New England Special	Southington
12433	Buffalo Onion, Vegetable and Potato	Thompsonville
12818	Buffalo Tobacco Grower	West Suffield
12819	Buffalo Tobacco Special	Enfield
A. L. Koster, Suffield, Conn.		
12864	A. S. T. Special Corn Fertilizer	East Hartford
Lister's Agricultural Chemical Works, Newark, N. J.		
12921	Celebrated Tobacco Fertilizer without Potash ...	Warehouse Point
12865	Complete Tobacco Fertilizer without Potash ...	Burnside
12529	Plant Food 1916	Yalesville
12821	Superior Ammoniated Superphosphate 1916	Danbury
Lowell Fertilizer Co., Boston, Mass.		
12833	Animal Brand	Wallingford
12922	Bone Fertilizer	Southington

¹ See note, page 74.² See note, page 75.

WITHOUT POTASH—(Continued).

Dealer's cash price per ton.	Nitrogen.						Phosphoric Acid.						Station No.	
	In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		So-called "Available."		
					Found.	Guaranteed.				Found.	Guaranteed.	Found.		Guaranteed.
\$67.50	1.66	1.25	0.02	1.17	4.10	4.11	7.77	2.59	1.20	11.56	11.00	10.36	10.00	12714
48.50	....	1.27	0.63	0.96	2.86	2.47	7.61	3.37	0.46	11.44	11.00	10.98	10.00	12524
61.50	1.43	0.97	0.21	0.93	3.54	3.29	6.60	3.43	1.02	11.05	11.00	10.03	10.00	12713
69.00	0.87	0.60	none	2.64	4.11	4.11	1.74	4.57	0.60	6.91	5.00	6.31	4.00	12717
90.00	2.43	2.85	0.12	0.65	6.05	6.58	7.20	2.12	0.38	9.70	9.00	9.32	8.00	12715
87.00	2.94	2.75	0.93		6.62	6.58	4.49	2.84	1.22	8.55	9.00	7.33	8.00	13156
58.00	....	0.95	0.57	0.87	2.39	2.46	6.92	4.23	0.72	11.87	11.00	11.15	10.00	12638
47.00	0.07	0.08	0.42	0.48	1.05	0.82	8.06	2.65	1.42	12.13	11.00	10.71	10.00	12615
59.00	0.56	0.92	0.57	0.73	2.78	2.87	7.53	3.92	0.27	11.72	11.00	11.45	10.00	12811
64.00	0.71	1.27	0.50	0.77	3.25	3.29	7.02	4.07	1.27	12.36	11.00	11.09	10.00	12799
77.00	1.38	0.10	1.00	1.85	4.33	4.10	1.21	5.64	1.36	8.21	5.00	6.85	4.00	12812
....	1.52	0.12	1.07	1.72	4.43	4.10	3.46	4.91	1.33	9.70	7.00	8.37	6.00	12853
68.00	....	0.88	0.97	0.63	2.48	2.46	6.87	4.24	0.70	11.81	11.00	11.11	10.00	12525
....	0.13	0.73	0.29	0.54	1.69	1.64	6.74	4.37	0.56	11.67	11.00	11.11	10.00	12721
....	0.17	0.21	0.20	0.33	0.91	0.82	7.78	3.61	0.27	11.66	11.00	11.39	10.00	12860
71.00	0.98	0.98	1.19	1.08	4.23	4.11	5.68	3.42	0.75	9.85	9.00	9.10	8.00	12616
55.00	0.36	1.13	0.77	1.02	3.28	3.28	7.27	3.63	0.77	11.67	11.00	10.90	10.00	12526
69.75	1.17	0.09	1.05	1.77	4.08	4.10	2.94	3.21	1.74	7.89	7.00	6.15	6.00	12569
40.25	0.35	0.19	0.03	0.62	1.19	0.80	7.94	4.34	1.18	13.46	11.00	12.28	10.00	12814
60.00	1.18	0.51	0.49	1.30	3.48	3.30	7.70	2.81	1.05	11.56	11.00	10.51	10.00	12820
49.00	0.75	0.20	0.17	0.66	1.78	1.60	6.48	3.83	1.09	11.40	11.00	10.31	10.00	12816
54.00	0.96	0.53	0.15	1.03	2.67	2.50	7.07	3.54	1.59	12.20	11.00	10.61	10.00	12433
....	1.08	1.11	0.20	1.82	4.21	4.10	0.76	3.61	1.04	5.41	5.00	4.37	4.00	12818
62.50	0.70	0.50	0.19	2.06	3.45	3.30	0.84	3.11	0.72	4.67	4.00	3.95	3.00	12819
....	0.17	2.59	0.03	1.74	4.53	4.10	7.11	2.05	0.67	9.83	10.00	9.16	8.00	12864
72.75	1.03	0.05	0.15	2.78	4.01	4.53	1.58	2.50	0.15	4.23	4.00	4.08	3.00	12921
68.00	1.03	1.03	0.76	1.11	3.93	4.11	2.43	2.32	0.97	5.72	5.00	4.75	4.00	12865
40.00	....	0.14	0.50	0.43	1.07	0.82	6.82	3.44	1.70	11.96	11.00	10.26	10.00	12529
63.00	1.43	1.45	0.26	0.51	3.65	3.29	8.13	2.12	0.79	11.04	11.00	10.25	10.00	12821
60.00	0.07	0.87	0.82	1.23	2.99	2.87	7.12	4.22	1.94	13.28	11.00	11.34	10.00	12833
58.00	0.10	0.07	1.00	0.87	2.04	2.06	6.82	3.79	1.75	12.36	11.00	10.61	10.00	12922

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.
<i>Sampled by Station:</i>		
Lowell Fertilizer Co., Boston, Mass. (Continued.)		
12832	Empress Brand	Saybrook
12535	Potato, Corn and Vegetable	Warehouse Point
12531 ¹	Potato Manure	Wallingford
12534 ¹	Potato Phosphate	Suffield
12834	Tobacco Grower	Warehouse Point
The Mapes Formula and Peruvian Guano Co., New York City.		
12837	C. S. Special without Potash	Hartford
12835 ¹	General Crop 1916	Windsor Locks
National Fertilizer Co., New York City.		
12427	Five Four Tobacco Manure	Somers
12545	Five Four Tobacco Manure	Silver Lane
12539	Nitrogen Phosphate Mixture No. 1	Guilford
12541	Nitrogen Phosphate Mixture No. 2	Wallingford
12842	Nitrogen Phosphate Mixture No. 3	Willimantic
12540	Nitrogen Phosphate Mixture No. 4	Guilford
12843 ¹	Nitrogen Phosphate Mixture No. 5	Windsorville
12844	Tobacco Special without Potash	Rockville
New England Fertilizer Co., Boston, Mass.		
12849 ¹	Corn and Grain Fertilizer	Norwich
12542	Potato Fertilizer	Meriden
12850	Special Tobacco Manure	Hazardville
12848 ¹	Standard Phosphate	Rockville
12543	Superphosphate	North Haven
12851	Tobacco Grower 5-4	Warehouse Point
Nitrate Agencies Co., New York City.		
12852	4-10 Universal Mixture	Milford
Olds and Whipple, Hartford, Conn.		
12576	Special Grass Fertilizer (less Potash)	Factory
12428	Special High Grade Tobacco Starter	Somers
12544	Special Onion, Corn and Potato Fertilizer	Factory
12870	Special Phosphate	Factory
12429	Tobacco Special Fertilizer	Somers
Parmenter and Poley Fertilizer Co., Boston, Mass.		
12872	Plymouth Rock Brand	Highwood
12873	Special Tobacco	Warehouse Point
12871	Star Brand Superphosphate	Highwood

¹ See note, page 74.

WITHOUT POTASH—(Continued).

Dealer's cash price per ton.	Nitrogen.						Phosphoric Acid.						Station No.	
	In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		So-called "Available."		
					Found.	Guaranteed.				Found.	Guaranteed.	Found.		Guaranteed.
\$48.00	0.10	0.10	0.57	0.64	1.41	1.23	7.37	3.56	1.79	12.72	11.00	10.93	10.00	12832
68.00	0.83	0.99	1.02	1.14	3.98	4.10	5.94	3.57	0.70	10.21	9.00	9.51	8.00	12535
58.00	....	0.06	0.83	0.86	2.65	2.46	6.81	3.82	1.69	12.32	11.00	10.63	10.00	12531
62.00	0.63	0.95	0.54	0.68	2.80	3.29	7.27	3.52	1.04	11.83	11.00	10.79	10.00	12534
69.75	1.52	0.11	0.86	1.66	4.15	4.11	3.65	4.46	1.55	9.66	7.00	8.11	6.00	12834
68.00	0.81	1.11	0.21	2.16	4.29	4.12	0.39	3.94	0.79	5.12	4.00	4.33	4.00	12837
46.00	0.63	0.43	....	0.58	1.64	1.65	0.86	5.85	4.55	11.26	10.00	6.71	8.00	12835
....	0.96	0.52	2.76		4.24	4.11	1.21	4.28	0.42	5.91	5.00	5.49	4.00	12427
68.00	1.05	0.09	....	2.97	4.11	4.11	2.05	3.02	0.46	5.53	5.00	5.07	4.00	12545
....	....	0.07	0.15	0.79	1.01	0.82	5.49	4.82	0.70	11.01	11.00	10.31	10.00	12539
48.00	....	0.08	0.38	1.20	1.66	1.65	7.21	3.07	1.82	12.10	11.00	10.28	10.00	12541
55.00	0.47	1.14	0.04	0.96	2.61	2.47	6.62	3.70	1.60	11.92	11.00	10.32	10.00	12842
....	0.94	1.40	0.14	0.95	3.43	3.29	7.44	3.43	0.99	11.86	11.00	10.87	10.00	12540
69.00	0.50	1.15	0.52	1.29	3.46	4.11	2.74	5.77	2.53	11.04	9.00	8.51	8.00	12843
....	0.78	0.23	0.06	3.30	4.37	4.53	1.08	3.90	0.52	5.50	4.00	4.98	3.00	12844
....	0.05	0.12	0.50	0.60	1.27	1.23	7.26	3.69	2.11	13.06	11.00	10.95	10.00	12849
52.50	0.19	0.86	0.72	0.79	2.56	2.46	6.74	3.71	1.52	11.97	11.00	10.45	10.00	12542
70.00	1.27	0.12	0.96	1.86	4.21	4.10	3.99	5.47	1.73	10.29	7.00	8.56	6.00	12850
43.00	0.08	0.07	0.32	0.40	0.87	0.82	7.12	3.22	1.22	11.56	11.00	10.34	10.00	12848
59.00	0.62	0.89	0.57	0.80	2.88	2.87	7.64	3.61	0.43	11.68	11.00	11.25	10.00	12543
68.00	1.43	0.08	1.00	1.69	4.20	4.10	0.84	5.42	1.59	7.85	5.00	6.26	4.00	12851
56.00	1.37	0.94	0.08	0.84	3.23	3.29	7.80	2.28	0.68	10.76	11.00	10.08	10.00	12852
66.30	0.10	1.33	0.13	3.51	5.07	4.95	4.12	1.70	0.95	6.77	4.00	5.82	4.00	12576
....	0.48	3.36	5.21		9.05	9.06	2.23	1.59	0.64	4.46	3.00	3.82	3.00	12428
47.26	....	1.00	0.35	1.49	2.84	2.45	5.62	3.16	0.64	9.42	8.00	8.78	8.00	12544
57.95	0.13	1.16	0.20	2.78	4.27	4.11	3.94	1.49	1.00	6.43	4.00	5.43	4.00	12870
....	1.04	0.05	3.17		4.26	4.11	1.72	2.55	1.69	5.96	3.00	4.27	3.00	12429
57.00	0.59	0.88	0.59	0.81	2.87	2.87	7.40	3.76	0.45	11.61	11.00	11.16	10.00	12872
66.00	1.16	0.19	1.26	1.94	4.55	4.10	1.32	4.40	1.33	7.05	5.00	5.72	4.00	12873
53.00	0.13	1.05	0.42	0.83	2.43	2.46	6.68	4.03	0.60	11.31	11.00	10.71	10.00	12871

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.
<i>Sampled by Station:</i>		
Pawtucket Rendering Co., Pawtucket, R. I.		
12894	Farm Favorite Brand 2½-10	Norwich
12893	Potato Fertilizer 4-10	Hebron
Reliable Fertilizer Co., South Manchester, Conn.		
12896	Fish and Phosphate	Factory
The Rogers and Hubbard Co., Portland, Conn.		
12874	All Soils-All Crops Phosphate	Hazardville
13327	Bone Base Oats and Top Dressing	Somerville
12879	Bone Base Oats and Top Dressing	Milford
13031 ¹	Bone Base Soluble Corn and General Crops Manure	Gildersleeve
12875	Bone Base Soluble Corn and General Crops Manure	Branford
12877	R. & H. Bone Base Soluble Tobacco Manure	Gildersleeve
12578	R. & H. Complete Phosphate	Branford
12618	R. & H. Climax Tobacco Brand	Windsor
12617	R. & H. Potato Phosphate	Gildersleeve
F. S. Royster Guano Co., Baltimore, Md.		
12577	Corn and Oats Ammoniated Phosphate	Branford
12777	Corn and Oats Ammoniated Phosphate	New Canaan
12776 ¹	Landmark Ammoniated Phosphate	New Canaan
12925 ¹	Penguin Ammoniated Phosphate	Glastonbury
13317	Penguin Ammoniated Phosphate	East Hartford
12579	Perfecto Tobacco Formula	Windsor
12627	Prime Fish Ammoniated Phosphate	New Canaan
12928	Steven's Formula	Glastonbury
Sanderson Fertilizer and Chemical Co., New Haven, Conn.		
12931	High Grade Ammoniated Phosphate	Stratford
12932	Phosphate without Potash	Shelton
12631	Special without Potash	Wethersfield
12580	Tobacco Grower 1916	Silver Lane
12930	Top Dressing for Grass and Grain, 1916, without Potash	Mount Carmel
M. L. Shoemaker and Co., Philadelphia, Pa.		
12935	Swift-Sure Phosphate for Tobacco and General Use	Glastonbury
Springfield Rendering Co., Springfield, Mass.		
12936	Animal Fertilizer	Thompsonville

¹ See note, page 74.

WITHOUT POTASH—(Continued).

Dealer's cash price per ton.	Nitrogen.				Phosphoric Acid.								Station No.	
	In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		"So-called Available."		
					Found.	Guaranteed.				Found.	Guaranteed.	Found.		Guaranteed.
\$58.00	0.74	0.09	0.46	0.95	2.24	2.06	6.21	3.96	0.86	11.03	11.00	10.17	10.00	12894
59.50	1.38	0.04	0.62	1.23	3.27	3.26	6.54	3.99	0.55	11.08	11.00	10.53	10.00	12893
47.00	....	0.22	0.39	1.18	1.79	1.64	8.24	3.07	1.56	12.87	10.50	11.31	10.00	12896
67.25	0.22	2.98	0.06	0.59	3.85	3.30	8.21	4.75	1.61	14.57	13.50	12.96	12.50	12874
83.50	3.92	0.10	2.07	1.63	6.09	6.00	0.07	5.47	8.89	14.43	12.00	5.54	6.00	13327
....	4.36	0.06	0.32	1.63	6.37	6.00	....	4.60	7.55	12.15	12.00	4.60	6.00	12879
53.25	0.33	0.89	0.45	0.73	2.40	2.50	2.49	7.09	3.48	13.06	12.00	9.58	10.00	13031
55.00	0.32	0.95	0.32	0.76	2.35	2.50	2.22	8.23	3.79	14.24	12.00	10.45	10.00	12875
77.50	0.12	1.56	1.21	2.13	5.02	5.00	1.15	9.53	2.70	13.38	13.00	10.68	10.00	12877
45.00	....	0.74	0.13	0.38	1.25	1.00	4.92	2.51	0.96	8.39	8.00	7.43	7.50	12578
71.00	0.05	1.94	0.57	1.77	4.33	4.12	0.07	2.94	1.66	4.67	4.00	3.01	3.00	12618
57.00	....	1.35	0.19	0.57	2.11	2.00	9.26	5.38	1.52	16.16	15.00	14.64	14.00	12617
40.00	....	0.28	0.14	0.45	0.87	0.82	4.42	3.00	1.02	8.44	8.50	7.42	8.00	12577
37.00	....	0.03	0.31	0.50	0.84	0.82	4.28	3.60	0.91	8.79	8.50	7.88	8.00	12777
63.50	....	1.32	0.27	1.14	2.73	3.29	7.13	2.82	0.64	10.59	10.50	9.95	10.00	12776
47.00	0.17	0.64	0.23	0.70	1.74	1.65	5.26	3.68	1.38	10.32	10.50	8.94	10.00	12925
65.00	0.11	0.85	0.25	0.62	1.83	1.65	6.71	3.69	0.91	11.31	10.50	10.40	10.00	13317
71.00	0.20	0.99	0.10	2.73	4.02	4.11	1.44	3.22	0.93	5.59	4.50	4.66	4.00	12579
44.75	....	0.90	0.24	0.46	1.60	1.65	5.21	3.11	0.90	9.22	8.50	8.32	8.00	12627
....	0.11	0.82	0.16	3.10	4.19	4.11	1.76	3.28	0.70	5.74	4.50	5.04	4.00	12928
59.50	0.22	1.50	0.45	1.30	3.47	3.29	6.35	3.67	1.83	11.85	11.00	10.02	10.00	12931
48.00	0.24	0.74	0.31	1.20	2.49	1.65	4.67	4.97	1.82	11.46	11.00	9.64	10.00	12932
49.00	0.36	1.12	0.37	1.01	2.86	2.47	6.91	3.57	1.84	12.32	11.00	10.48	10.00	12631
68.03	1.05	0.12	0.14	3.34	4.65	4.53	0.93	3.97	0.22	5.12	4.00	4.90	3.00	12580
....	1.24	1.04	0.74	1.88	4.90	4.11	4.23	4.24	2.62	11.09	9.00	8.47	8.00	12930
....	0.14	1.90	0.29	1.24	3.57	3.28	7.34	3.70	2.56	13.60	12.00	11.04	9.00	12935
54.00	0.11	0.81	1.09	0.76	2.77	2.46	7.03	4.24	0.78	12.05	11.00	11.27	10.00	12936

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.
	<i>Sampled by Station:</i>	
	Virginia-Carolina Chemical Co., New York City.	
12960	Ammoniated Bone Phosphate for All Crops	Thomaston
12941	High Grade Corn and Vegetable Compound without Potash	North Haven
12582	Indian Brand for Tobacco (C. S. M. without Potash)	Glastonbury
12635	Tobacco and Onion Special	Glastonbury
	What Cheer Chemical Co., Pawtucket, R. I.	
12491	Ammonia 4 Acid Phosphate 10	Guilford
	Wilcox Fertilizer Co., Mystic, Conn.	
12899	Corn Special	Ellington
12898	Grain Fertilizer	Ellington
12584	Grass Fertilizer	Suffield
	Worcester Rendering Co., Auburn, Mass.	
12897	Royal Worcester Corn and Grain Fertilizer	Putnam
12641	Royal Worcester Potato and Vegetable Fertilizer..	Putnam
	<i>Sampled by Purchasers:</i>	
12556	Amer. Agri. Chem. Co.'s Ammoniated Fertz. AAA	<i>Deep River:</i> —Connecticut Valley Orchard Co.
12840	A. L. Koster's A. S. T. Special Corn Fertilizer ...	<i>Hartford:</i> —Fassler and Silberman
12437	Olds and Whipple's Tobacco Special Fertilizer ...	<i>West Suffield:</i> —H. C. Nelson
13335	What Cheer Chemical Co.'s Special Tobacco	<i>Silver Lane:</i> —Thos. Molumphy
	<i>Manufacturer's Sample:</i>	
13238	Pawtucket Rendering Co.'s Animal Brand	Pawtucket, R. I.

WITHOUT POTASH—(Concluded).

Dealer's cash price per ton.	Nitrogen.						Phosphoric Acid.						Station No.	
	In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		So-called "Available."		
					Found.	Guaranteed.				Found.	Guaranteed.	Found.		Guaranteed.
\$55.00	0.10	0.10	0.32	1.29	1.81	1.65	8.42	2.15	0.20	10.77	11.00	10.57	10.00	12960
53.50	0.21	0.97	0.14	1.24	2.56	2.47	8.62	2.36	0.23	11.21	11.00	10.98	10.00	12941
....	0.26	2.05	....	1.81	4.12	4.11	2.61	1.96	0.37	4.94	5.00	4.57	4.00	12582
....	....	1.50	0.50	1.41	3.41	3.29	6.27	1.66	0.33	8.26	9.00	7.93	8.00	12635
....	0.40	0.08	3.25		3.73	3.29	2.79	5.82	6.97	15.58	10.00	8.61	....	12491
60.50	0.56	0.87	0.46	1.57	3.46	3.30	7.67	3.04	0.83	11.54	11.00	10.71	10.00	12899
45.00	0.18	0.08	0.28	1.26	1.80	1.65	6.69	3.82	1.14	11.65	11.00	10.51	10.00	12898
69.00	1.11	0.87	0.46	1.62	4.06	4.12	6.21	2.78	1.28	10.27	9.00	8.99	8.00	12584
50.00	0.53	0.26	0.61	0.73	2.13	2.06	6.10	4.37	0.63	11.10	11.00	10.47	10.00	12897
63.00	0.56	0.98	1.01	0.83	3.38	3.23	6.72	4.48	0.75	11.95	11.00	11.20	10.00	12641
....	....	....	....	....	2.64	2.47	....	....	....	12.03	11.00	....	....	12556
....	....	....	....	....	4.17	4.10	7.18	1.26	0.54	8.98	....	8.44	8.00	12840
68.50	0.68	0.09	3.72		4.49	4.11	1.99	1.32	0.83	4.14	3.00	3.31	3.00	12437
55.00	....	....	....	....	4.75	3.00	2.21	3.03	0.88	6.12	....	5.24	....	13335
53.20	0.41	0.56	0.69	1.09	2.75	2.87	6.79	3.30	0.54	10.63	11.00	10.09	10.00	13238

NITROGENOUS SUPERPHOSPHATES CONTAINING POTASH.

In the table are given 107 analyses of brands belonging to this class. (See page 92.)

COMPOSITION AND COST OF THE BRANDS.

The amounts of potash guaranteed are naturally much smaller than before the war.

Of the samples drawn by the station agent

1	per cent. of potash was guaranteed in 72 samples.
2	" " " " " " " 15 "
3	" " " " " " " 9 "
4	" " " " " " " 7 "
	—
	103

Of nitrogen

.82	per cent. was guaranteed in 14 samples.
1.65	" " " " " " " 24 "
2.47	" " " " " " " 17 "
3.29	" " " " " " " 18 "
4.11	" " " " " " " 11 "
Over 4.11	per cent. in 18 "
Scattering	. . . . . 4 "
	—
	106

To compare the relative economy of purchase of goods having these different guaranties of nitrogen we may make a "valuation" of the fertilizer elements guaranteed in each, allowing 45 cents per pound for nitrogen, 10 cents for "available" phosphoric acid and 30 cents for potash.

This has been done in the case of each brand, the valuation then compared with the average cost of each formula having the same nitrogen guaranty, the percentage difference between the quoted retail price calculated and the weighted average determined. The results are as follows:

PERCENTAGE DIFFERENCE BETWEEN COST AND VALUATION.

		Percentage difference.	Average cost per ton.
10	brands carrying 0.82 per cent. nitrogen	52.2	\$46.99
23	" " " 1.65 " "	35.3	58.39
14	" " " 2.47 " "	32.4	62.21
14	" " " 3.29 " "	23.3	71.41
10	" " " 4.11 " "	38.8	73.38

The "percentage difference" represents approximately the percentage amount, reckoned on the cost of the fertilizer ingredients themselves, which covers the costs, profits and losses of manufacture and selling.

The practical lesson taught by it is that it does not pay the buyer to get low grade goods if he wishes to buy a fertilizer for general use. The ton price is lower but the plant food in them costs more.

In cases where he wishes to use a relatively small amount of nitrogen with a larger quantity of phosphoric acid on a special crop, oats for example, he can generally save money by buying a small amount of high grade fertilizer and using with it a proper amount of acid phosphate, if he does not find it even more economical to buy all the chemicals unmixed and prepare the mixture himself. The economy of this practice must be largely determined in each case by costs of the chemicals and labor locally, and method of payment.

GUARANTIES.

Of the brands sampled by the station, 7 failed to meet their guaranty of nitrogen, 4 failed in available phosphoric acid and 9 in potash while two were deficient in both nitrogen and potash. In all cases, however, except those named below, the deficiency in one ingredient was fully covered in money value by the excess of another.

In five brands the money value of the deficiencies was more than one dollar per ton, valuing nitrogen at 45 cents, available phosphoric acid at 10 cents and potash at 30 cents per pound.

	Deficiency.
12781 Armour's Grain Grower 2-8-2	1.18
12709 Bowker's Complete Manure	1.97
12970 Bowker's Lawn and Garden Dressing	2.52
12831 Listers Special Tobacco Fertilizer 1916	1.18
12895 Pawtucket Rendering Co.'s 2-8-4 Fertilizer	2.10

QUALITY OF THE NITROGEN.

The solubility of the water-insoluble nitrogen as determined by the two methods in use (the neutral permanganate and alkaline permanganate methods) indicates that a portion of the organic nitrogen is of inferior agricultural value in the following brands:

- 12781 Armour's Grain Grower 2-8-2.
- 12915 Atlantic Packing Co.'s 2-8-4.
- 12536 Mapes's Potato Manure 1916.
- 12629 Royster's Fish and Potash Guano.
- 12924 Royster's Truckers' Delight.

ANALYSIS REQUIRING SPECIAL NOTICE.

12628. This sample, page 96, contained very much less nitrogen than was guaranteed in the brand which it was supposed to represent and also contained 2.52 per cent. of potash which was not guaranteed in that brand. It is quite certain that through some error the sample does not at all represent the brand the name of which it bore.

BORAX IN FERTILIZERS.

Borax is known to occur in the potash salts obtained from Searles Lake in California and it has been proved that even rather small amounts of borax in a fertilizer may be poisonous to crops.

The United States Department of Agriculture prescribes that no fertilizer shall contain more than two pounds of borax or its equivalent in the ton unless the actual amount of borax is plainly stated on the package or its tag.

The Maine Department of Agriculture through its Division of Inspection has ruled that any fertilizer containing an appreciable amount of borax or its compounds will be deemed to be adulterated.

In our opinion there is very little chance that any dangerous amount of borax will be found in fertilizers hereafter. Manufacturers are fully aware of the danger, which may be as disastrous to their business as to that of their customers.

HOME-MIXED NITROGENOUS SUPERPHOSPHATES.

13400. Made by H. D. Johnson, Highwood. 630 lbs. tankage, 400 lbs. Nebraska potash, 800 lbs. acid phosphate, 100 lbs. nitrate of soda.

12988. Made by Wesley N. Peck, Mt. Carmel. "Two parts acid phosphate, one part cotton seed meal."

12972. Mixed by Olds & Whipple, Hartford, to order of the American Sumatra Tobacco Co., Silver Lane Plantation.

12971. Mixed by the same firm for the same corporation, Windsor Locks Plantation.

ANALYSES.

	13400	12988	12972	12971
Nitrogen in nitrates	1.56	....	0.98	0.63
as ammonia	0.30	....	0.07	0.07
organic, water-soluble .....		....	0.08	0.47
active insoluble	2.34	....	2.22	1.58
inactive insoluble ...		....	2.02	1.73
total	4.20	2.03	5.37	4.48
Phosphoric acid, water-soluble	0.70	11.73	0.67	0.70
citrate-soluble	4.96	1.34	5.55	5.90
citrate-insoluble	2.64	0.20	0.23	0.26
total	8.30	13.27	6.45	6.86
Potash, calculated as muriate	1.36	....	....	0.76
as sulphate	3.21	....	....	2.90
total	4.57	0.66	....	3.66

VI. MISCELLANEOUS FERTILIZERS AND WASTE PRODUCTS.

TOBACCO STEMS AND STALKS.

Three samples were analyzed as follows:

13390. Green Tobacco Stalks. Sent by W. S. Pinney & Co., Suffield.

12495. Tobacco Stems. Sent by L. Wetstone, Ellington.

13525. Whipped Tobacco Stems. Sent by Windsor Paper and Waste Company, Windsor.

ANALYSES OF TOBACCO STEMS.

Station No.	13390	12495	13525
Nitrogen	0.27	2.13	1.03
Phosphoric acid	0.05	0.53	0.56
Potash (total)	0.41	6.09	4.84

The sample of green tobacco stalks, 13390, consisted of 29 stalks from shade grown tobacco. Calculating 11,000 stalks to the acre, they would contain the following:

Nitrogen	60.5 pounds
Phosphoric acid	11.2 "
Potash	91.9 "

(Continued on page 98.)

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.	Dealer's cash
<i>Sampled by Station:</i>			
American Agricultural Chemical Co., New York City.			
12643	Complete Potato Mixture	Southport	\$80.00
12652	Odorless Grass and Lawn Top Dressing Revised	Windsor	24.00
12510	Sure Growth Phosphate 1916	Glastonbury	58.25
12761	Bradley's Complete Manure for Potatoes and Vegetables	Groton	68.00
12760	Bradley's Corn Phosphate 1916	Willimantic	55.00
12607	Bradley's New Method Fertilizer 1916	Norwalk	45.00
12647	Bradley's Potato Manure 1916	Suffield	59.00
12762	Bradley's Potato Fertilizer 1919	Willimantic	55.00
12905	Bradley's B. D. Sea Fowl Guano	East River	50.00
12973	Bradley's Tobacco Manure Carbonate	East Hartford .....	.....
12610	Bradley's Unicorn 1916	Bristol	53.00
12765	East India Corn King 1916	Southport	58.75
12764	East India Economizer Phosphate 1916	North Haven .....	.....
12906	East India Potato and Garden Manure	Bloomfield	67.75
12608	Great Eastern General 1916	New Canaan	45.00 ¹
12907	Quinnipiac Ammoniated Dissolved Bone 1916	South Manchester	45.00
12515	Quinnipiac Climax Phosphate 1916	Southport	42.00
12649	Quinnipiac Fish and Potash Mixture 1916	Windsor	56.75
12650	Quinnipiac Market Garden Manure 1916	Southport	66.75
12909	Wheeler's Cuban Tobacco Grower 1916	Granby	73.70 ²
12651	Wheeler's Corn Fertilizer 1916	East Hampton	56.00
12908	Wheeler's Potato Manure 1916	East Hampton	57.75
12513	Williams and Clark's Matchless Fertilizer 1916	Waterbury	54.00
12913	Williams and Clark's Meadow Queen Fertilizer 1916	Milford	58.00
12514	Williams and Clark's Special Prolific Crop Producer	Waterbury	47.00
Armour's Fertilizer Works, Chrome, N. J.			
12595	Armour's Crop Grower	New Canaan .....	.....
12781	¹ Armour's Grain Grower 2-8-2	New London	48.00
12518	Armour's 2-8-3	Windsor Locks	64.00
12958	Armour's Special Tobacco Grower No. 1	Suffield .....	.....
12517	Armour's Wheat, Corn and Oats (Special) 1-7-1 Fertz... ..	New Haven	47.00
Atlantic Packing Co., New Haven, Conn.			
12914	Atlantic 2-8-2	New Britain	63.00
12915	² Atlantic 2-8-4	New Britain	78.00
Berkshire Fertilizer Co., Bridgeport, Conn.			
12782	Berkshire Complete Fertilizer	Ellington	63.00
12785	Berkshire Complete Tobacco	Scitico .....	.....
Bowker Fertilizer Co., New York City.			
12709	¹ Bowker's Complete	Milldale	82.00
12707	Bowker's Complete 3-8-3	Rockville	63.00

¹ See note, page 89.² See note, page 90.

WITH POTASH.

In nitrates.	Nitrogen.				Phosphoric Acid.								Potash.			Station No.
	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		"So-called "Available."		As muriate.	Total.	Guaranteed.	
				Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.				
0.78	1.32	0.21	1.07	3.38	3.29	9.15	1.65	0.46	11.26	11.00	10.80	10.00	3.28	3.28	3.00	12643
2.46	0.15	0.16	0.85	3.62	3.91	3.94	2.02	0.50	6.46	6.99	5.96	5.00	0.68	1.37	1.00	12652
0.47	1.11	0.16	1.07	2.81	2.47	3.27	5.79	1.71	10.77	10.00	9.06	9.00	0.74	1.17	1.00	12510
0.82	1.52	0.06	1.02	3.42	3.29	6.78	3.01	1.16	10.95	10.00	9.79	9.00	0.72	1.13	1.00	12761
0.08	0.63	0.09	0.95	1.75	1.65	6.76	3.31	1.15	11.22	11.00	10.07	10.00	0.70	1.12	1.00	12760
...	0.03	0.31	0.54	0.88	0.82	6.37	2.55	0.84	9.76	9.00	8.92	8.00	0.84	1.08	1.00	12607
0.74	0.73	0.22	0.90	2.59	2.47	7.68	2.27	1.01	10.96	10.00	9.95	9.00	0.64	1.12	1.00	12647
0.16	0.59	0.05	0.94	1.74	1.65	6.85	3.59	1.15	11.59	11.00	10.44	10.00	0.72	1.10	1.00	12762
...	0.08	0.43	0.51	1.02	0.82	7.68	2.96	0.87	11.51	11.00	10.64	10.00	1.00	1.00	1.00	12905
1.00	0.05	0.92	2.63	4.60	4.53	0.40	4.48	0.12	5.00	4.00	4.88	3.00	0.52	*3.05	3.00	12973
0.12	0.45	0.23	0.86	1.66	1.65	7.84	1.57	1.04	10.45	10.00	9.41	9.00	0.96	0.96	1.00	12610
0.46	0.78	0.17	1.01	2.42	2.47	8.12	1.53	0.97	10.62	10.00	9.65	9.00	0.84	1.01	1.00	12765
0.09	0.06	0.25	0.41	0.81	0.82	6.58	2.17	0.92	9.67	9.00	8.75	8.00	0.78	0.95	1.00	12764
0.82	0.86	0.25	1.33	3.26	3.29	5.38	4.09	1.88	11.35	10.00	9.47	9.00	0.47	1.10	1.00	12906
0.13	0.14	0.16	0.56	0.90	0.82	4.48	3.57	1.06	9.11	9.00	8.05	8.00	0.99	0.99	1.00	12608
0.09	0.41	0.22	0.83	1.56	1.65	7.56	1.61	1.01	10.18	10.00	9.17	9.00	0.84	0.96	1.00	12907
0.10	0.11	0.24	0.44	0.89	0.82	6.65	2.53	0.99	10.17	9.00	9.18	8.00	0.72	1.00	1.00	12515
0.47	0.74	0.27	1.39	2.87	2.47	5.76	3.22	1.10	10.08	10.00	8.98	9.00	0.48	0.90	1.00	12649
0.06	1.18	0.89	0.96	3.09	3.29	8.43	1.90	1.07	11.40	10.00	10.33	9.00	0.60	0.97	1.00	12650
0.86	0.05	...	3.44	4.35	4.53	1.58	3.07	0.36	5.01	4.00	4.65	3.00	0.35	1.10	1.00	12909
...	0.53	0.33	0.93	1.79	1.65	9.06	1.44	1.24	11.74	11.00	10.50	10.00	0.58	0.75	1.00	12651
0.11	0.67	0.25	1.03	2.06	2.06	8.47	1.81	1.18	11.46	11.00	10.28	10.00	0.80	0.96	1.00	12908
0.46	0.48	...	0.91	1.85	1.65	5.54	5.09	0.63	11.26	10.00	10.63	9.00	0.40	1.09	1.00	12513
0.12	1.05	0.22	0.98	2.37	2.47	7.68	1.45	1.10	10.23	10.00	9.13	9.00	0.96	1.07	1.00	12913
0.10	0.11	0.21	0.39	0.81	0.82	6.63	2.25	0.86	9.74	9.00	8.88	8.00	0.76	0.92	1.00	12514
0.21	0.23	0.06	0.50	1.00	0.82	3.73	4.55	0.78	9.06	8.50	8.28	8.00	0.69	1.99	2.00	12595
0.67	0.12	0.14	0.72	1.65	1.65	4.11	3.99	1.37	9.47	8.50	8.10	8.00	0.60	1.77	2.00	12781
1.01	0.17	0.07	0.56	1.81	1.65	5.50	2.56	0.72	8.78	8.50	8.06	8.00	1.52	3.13	3.00	12518
1.02	0.07	0.23	2.75	4.07	4.11	2.38	2.56	2.19	7.13	4.50	4.94	4.00	0.23	1.09	1.00	12958
0.09	0.34	0.09	0.44	0.96	0.82	2.31	4.70	0.91	7.92	7.50	7.01	7.00	1.02	1.02	1.00	12517
0.37	0.51	0.32	0.47	1.67	1.64	6.23	2.95	0.47	9.65	9.00	9.18	8.00	2.29	2.29	2.00	12914
0.37	0.49	0.29	0.44	1.59	1.64	6.18	3.03	0.45	9.66	9.00	9.21	8.00	3.72	3.72	4.00	12915
0.24	2.20	0.02	0.45	2.91	2.50	7.76	2.26	0.33	10.35	9.00	10.02	8.00	2.09	2.09	2.00	12782
0.97	1.60	0.24	1.56	4.37	4.11	2.41	1.88	0.19	4.48	4.00	4.29	3.00	0.31	1.55	1.00	12785
1.61	0.79	0.05	1.05	3.50	3.29	8.51	1.84	0.77	11.12	11.00	10.35	10.00	0.76	2.87	3.00	12709
0.38	1.24	0.16	0.69	2.47	2.47	6.82	1.95	0.70	9.47	9.00	8.77	8.00	1.74	2.64	3.00	12707

* Potash as carbonate 2.05.

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.	Dealer's cash price per ton.
<i>Sampled by Station:</i>			
Bowker Fertilizer Co., New York City. (Continued.)			
12523	Bowker's Farm and Garden Phosphate 1916, Revised ...	New Haven	\$60.00
12708	Bowker's Hill and Drill Phosphate 1916	Hazardville	62.25
12970	'Bowker's Lawn and Garden Dressing 1918	New Haven	75.00
12706	Bowker's Potato Phosphate 1916	Norwich	60.00
12697	Bowker's Sure Crop Phosphate 1916	Waterbury	50.00
12599	Stockbridge General Crop Manure 1916	Milldale	70.00
E. D. Chittenden Co., Bridgeport, Conn.			
12710	Complete Tobacco and Onion Grower 2% Potash	Suffield .....	.....
12798	Connecticut Tobacco Grower with 2% Potash	West Suffield	95.00
12803	Tobacco Special with 2% Potash	Suffield	79.00
Coe-Mortimer Co., New York City.			
12716	New Englander Special 1916	Brooklyn .....	.....
12801	Red Brand Excelsior Guano 1916	Poquonock	73.00
Essex Fertilizer Co., Boston, Mass.			
12858	Essex 2-8-2	South Manchester	64.00
L. T. Frisbie Co., New Haven, Conn.			
12859	Frisbie's 1-8-3	Norwich .....	.....
12861	Frisbie's 2-8-2	New London .....	.....
12862	Frisbie's 2-8-4	Hartford	66.50
12527	Frisbie's 4-8-4	Branford	82.25
International Agricultural Corporation, Buffalo, N. Y.			
12813	Buffalo Economy	West Cheshire ...	52.00
12815	Buffalo General Favorite	West Suffield ...	.....
12817	Buffalo Potato and Corn	Moosup	85.00
12528	Buffalo Tip Top	Waterbury	52.00
Lister's Agricultural Chemical Works, Newark, N. J.			
12827	Ammoniated Dissolved Superphosphate 1916	Andover	56.00
12828	Corn and Potato Fertilizer 1916	Danbury	54.00
12830	Perfect Potato Manure 1916	Rockville	65.00
12530	Potato and Corn No. 2 Fertilizer 1916	Yalesville	60.00
12831	¹ Special Tobacco Fertilizer 1916	Brookfield	52.25
12829	Standard Pure Superphosphate of Lime 1916	Burnside	57.00
12826	Success Fertilizer 1916	East Canaan	52.00
Mapes Formula and Peruvian Guano Co., New York City.			
12536	² Corn Manure 1916 Brand	Suffield	59.00
12537	Potato Manure 1916 Brand	Meriden	72.00

¹ See note, page 89.² See note, page 90.

WITH POTASH—(Continued).

In nitrates.	Nitrogen.				Phosphoric Acid.								Potash.			Station No.
	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		So-called "Available."		As muriate.	Total.	Guaranteed.	
				Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.				
0.78	0.06	0.17	0.76	1.77	1.65	6.10	3.43	2.12	11.65	10.00	9.53	9.00	0.56	1.19	1.00	12523
0.08	1.29	0.70	0.52	2.59	2.47	8.02	2.18	0.81	11.01	10.00	10.20	9.00	0.39	1.00	1.00	12708
0.39	0.98	0.17	0.65	2.19	2.47	6.93	1.43	0.77	9.13	9.00	8.36	8.00	0.47	0.88	1.00	12970
0.59	0.45	0.18	0.64	1.86	1.65	5.69	5.22	1.69	12.60	11.00	10.91	10.00	0.66	1.11	1.00	12706
0.13	0.11	0.23	0.49	0.96	0.82	7.80	2.34	1.46	11.60	11.00	10.14	10.00	0.72	0.93	1.00	12697
0.99	1.31	0.04	0.96	3.30	3.29	7.87	1.42	0.92	10.21	10.00	9.29	9.00	0.08	0.98	1.00	12599
0.12	1.85	0.40	1.12	3.49	3.29	5.18	2.46	0.27	7.91	9.00	7.64	8.00	0.70	2.02	2.00	12710
0.25	2.61	0.33	2.05	5.24	4.94	2.52	2.30	0.77	5.59	5.00	4.82	4.00	0.40	2.09	2.00	12798
0.25	1.96	0.08	1.88	4.17	4.11	2.54	2.17	0.79	5.50	5.00	4.71	4.00	0.40	1.98	2.00	12803
....	0.38	0.06	0.50	0.94	0.82	5.09	2.88	0.78	8.75	9.00	7.97	8.00	0.74	1.08	1.00	12716
0.43	1.10	0.76	1.79	4.08	4.11	2.43	5.45	3.30	11.18	9.00	7.88	8.00	0.72	1.17	1.00	12801
0.10	0.51	0.48	0.64	1.73	1.64	6.25	2.22	0.75	9.22	9.00	8.47	8.00	2.10	2.10	2.00	12858
0.19	0.19	0.13	0.26	0.77	0.82	6.41	2.17	0.12	8.70	9.00	8.58	8.00	2.64	2.64	3.00	12859
0.09	0.86	0.34	0.52	1.81	1.64	4.39	4.46	0.60	9.45	9.00	8.85	8.00	0.84	1.84	2.00	12861
0.14	0.80	0.32	0.52	1.78	1.64	3.26	5.75	0.73	9.74	9.00	9.01	8.00	1.71	4.03	4.00	12862
0.67	1.00	0.82	1.12	3.61	3.29	3.72	5.03	1.25	10.00	9.00	8.75	8.00	1.75	3.94	4.00	12527
0.56	0.32	0.15	0.64	1.67	1.65	6.52	3.46	1.05	11.03	11.00	9.98	10.00	1.07	1.07	1.00	12813
0.09	0.24	0.12	0.41	0.86	0.80	4.98	3.68	1.54	10.20	9.00	8.66	8.00	1.11	1.11	1.00	12815
0.20	0.59	0.18	0.93	1.90	1.65	0.93	7.14	1.20	9.27	9.00	8.07	8.00	2.99	3.48	4.00	12817
0.09	0.23	0.17	0.37	0.86	0.80	4.96	3.63	1.20	9.79	9.00	8.59	8.00	1.90	1.90	2.00	12528
0.17	0.33	0.69	1.67	2.86	2.06	4.48	3.70	1.29	9.47	9.00	8.18	8.00	0.90	0.90	1.00	12827
....	0.10	1.26	0.77	2.13	2.06	6.14	3.08	1.35	10.57	9.00	9.22	8.00	0.39	0.96	1.00	12828
0.04	1.67	0.72	1.07	3.50	3.29	5.62	3.42	1.73	10.77	10.00	9.04	9.00	0.56	1.11	1.00	12830
0.19	0.24	0.87	0.92	2.22	2.06	5.02	4.17	2.41	11.60	11.00	9.19	10.00	0.56	0.99	1.00	12530
0.06	0.40	0.90	0.88	2.24	2.06	4.03	4.21	2.98	11.22	11.00	8.24	10.00	0.66	1.12	1.00	12831
0.33	0.33	0.72	1.68	3.06	2.47	5.74	3.31	1.85	10.90	10.00	9.05	9.00	0.96	1.04	1.00	12829
....	1.17	0.57	0.78	1.52	1.23	7.68	2.95	1.97	12.60	11.00	10.63	10.00	0.90	1.00	1.00	12826
1.53	0.05	0.13	1.16	2.87	2.47	0.78	7.20	4.26	12.24	10.00	7.98	8.00	0.56	1.01	1.00	12536
3.22	0.05	....	0.50	3.77	3.71	2.60	4.87	1.18	8.65	8.00	7.47	8.00	0.60	1.22	1.00	12537

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.	Dealer's cash price per ton.
<i>Sampled by Station:</i>			
Mapes Formula and Peruvian Guano Co., New York City.			
<i>(Continued.)</i>			
12836	C. S. Tobacco Manure	Burnside .....	.....
12538	Tobacco Starter Improved	Hartford	\$71.00
National Fertilizer Co., New York City.			
12868	Complete Root and Grain Fertilizer 1916	Silver Lane	68.00
12867	Eureka Potato Fertilizer 1916	Guilford .....	.....
12866	Market Garden Revised Fertilizer	Willimantic	72.00
12845	Universal Grain and Potato Fertilizer	Willimantic	46.00
12846	Universal Phosphate 1916	Wallingford	46.00
12847	XXX Fish and Potash 1916	South Manchester	57.00
Olds and Whipple, Hartford, Conn.			
12869	Complete Corn, Potato and Onion Fertilizer	Factory	59.62
12575	Complete Tobacco Fertilizer	Factory	67.62
Pawtucket Rendering Co., Pawtucket, R. I.			
12895	1-2-8-4 Fertilizer	Gilead	66.50
Rogers and Hubbard Co., Portland, Conn.			
13318	Hubbard's Bone Base Fertilizer for Seeding Down	Factory	61.00
12876	Hubbard's Bone Base Soluble Potato Manure	Milford .....	.....
12878	R. and H. Tobacco Grower (Vegetable Formula)	Gildersleeve	85.00
13366	R. and H. Tobacco Grower (Vegetable Formula)	Windsor Locks ..	.....
F. S. Royster Guano Co., Baltimore, Md.			
12927	Arrow Head Tobacco Formula	Glastonbury .....	.....
12630	Dreadnaught Guano	Plainville	61.00
12629	Fish and Potash Guano	Branford	50.00
12628	.....	Madison	62.00
12926	Pipe of Peace Tobacco Formula	Norwich	74.25
12924	Trucker's Delight Guano	East Granby	82.25
Sanderson Fertilizer and Chemical Co., New Haven, Conn.			
12634	Atlantic Coast Bone, Fish and Potash 1916	Branford	53.50
12632	Corn Superphosphate 1916	Branford	54.00
12581	Formula A 1916	Guilford	65.00
12929	Formula B 1916	Windsor Locks ..	.....
12633	Potato Manure 1916	East Hampton ..	57.00
12933	Kelsey's Bone, Fish and Potash 1916	Branford .....	.....

¹ See note, page 89.² See note, page 90.

WITH POTASH—(Continued).

Nitrogen.						Phosphoric Acid.						Potash.			Station No.	
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		So-called "Available."		As muriate.	Total.		Guaranteed.
				Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.				
0.91	0.97	0.15	2.54	4.57	4.12	0.35	4.08	0.57	5.00	4.00	4.43	4.00	0.70	1.26	1.00	12836
3.41	0.04	0.36	1.03	4.84	4.12	1.07	5.14	2.94	9.15	8.00	6.21	6.00	1.08	1.40	1.00	12538
1.46	0.92	0.24	0.78	3.40	3.29	7.37	2.02	1.15	10.54	10.00	9.39	9.00	0.40	1.06	1.00	12868
0.17	1.30	....	0.93	2.40	2.47	7.37	2.60	0.52	10.49	10.00	9.97	9.00	0.52	0.88	1.00	12867
0.61	1.18	0.10	0.68	2.57	2.47	4.85	4.10	0.70	9.65	9.00	8.05	8.00	2.07	2.88	3.00	12866
....	0.33	0.09	0.48	0.90	0.82	5.38	3.01	0.64	9.03	9.00	8.39	8.00	0.35	1.03	1.00	12845
0.06	0.13	0.19	0.43	0.81	0.82	7.30	2.89	1.22	11.41	11.00	10.19	10.00	0.12	0.88	1.00	12846
0.52	0.55	0.23	1.07	2.37	2.06	5.81	4.87	1.52	12.20	11.00	10.68	10.00	0.36	0.93	1.00	12847
1.33	0.27	0.11	2.28	3.99	3.30	1.22	5.78	1.07	8.07	6.00	7.00	6.00	0.80	1.24	1.00	12869
0.52	0.15	0.33	3.38	4.38	4.11	1.07	3.02	0.29	4.38	3.00	4.09	3.00	0.32	1.47	1.00	12575
....	0.75	0.33	0.31	1.39	1.75	5.96	3.63	0.36	9.95	9.00	9.59	8.00	3.64	3.64	4.00	12895
0.50	0.06	0.50	1.77	2.83	2.47	0.43	6.75	11.48	18.66	15.00	7.18	6.00	2.22	4.15	4.00	13318
1.86	0.54	0.45	1.39	4.24	4.25	1.25	8.90	2.60	12.75	13.00	10.15	10.00	1.07	1.98	2.00	12876
0.66	0.17	0.28	4.10	5.21	5.00	0.19	5.30	2.32	7.81	5.00	5.49	4.00	0.31	1.15	1.00	12878
1.11	0.11	0.11	3.73	5.06	5.00	0.13	4.97	2.17	7.27	5.00	5.10	4.00	0.35	1.13	1.00	13366
0.30	0.78	0.16	3.06	4.30	4.11	1.83	2.73	0.56	5.12	4.50	4.56	4.00	0.17	1.88	2.00	12927
....	0.84	0.34	0.70	1.88	1.65	4.47	3.74	1.05	9.26	8.50	8.21	8.00	0.23	2.07	2.00	12630
0.09	0.89	0.23	0.44	1.65	1.65	5.57	2.57	0.78	8.92	8.50	8.14	8.00	0.23	0.93	1.00	12629
....	0.96	0.28	0.83	2.07	....	4.75	5.60	0.79	11.14	....	10.35	....	....	2.59	....	12628
0.10	0.83	0.24	2.69	3.86	4.11	1.24	2.47	0.65	4.36	3.50	3.71	3.00	0.11	1.23	1.00	12926
0.09	1.68	0.50	0.94	3.21	3.29	1.97	6.22	1.25	9.44	8.50	8.19	8.00	1.04	3.96	4.00	12924
....	0.60	0.25	1.03	1.88	1.65	2.27	6.81	2.69	11.77	10.00	9.08	9.00	0.76	1.09	1.00	12634
....	0.68	0.31	1.02	2.01	1.65	4.44	5.70	2.92	13.06	11.00	10.14	10.00	0.56	1.09	1.00	12632
1.22	0.90	0.14	1.33	3.59	3.29	6.89	3.01	1.10	11.00	10.00	9.90	9.00	0.45	1.31	1.00	12581
0.65	0.86	0.22	1.32	3.05	3.28	5.42	4.39	2.43	12.24	10.00	9.81	9.00	0.44	1.00	1.00	12929
....	1.16	0.11	0.87	2.14	2.06	1.97	6.02	1.71	9.70	9.00	7.99	8.00	0.64	0.98	1.00	12633
0.43	0.81	0.16	1.08	2.48	2.47	3.71	5.30	2.84	11.85	10.00	9.01	9.00	0.58	1.02	1.00	12933

NITROGENOUS SUPERPHOSPHATES

Station No.	Manufacturer and Brand.	Place of Sampling.	Dealer's cash price per ton.
<i>Sampled by Station:</i>			
Virginia-Carolina Chemical Co., New York City.			
12937	Indian Brand for Tobacco No. 1	Tariffville	\$79.00
12938	Indian Brand for Tobacco No. 2	Granby	70.00
12939	National Corn, Grain and Grass Top Dressing	Hartford	68.00
12940	Owl Brand Potato and Truck Fertilizer with 1% Potash	Hartford	54.00
12583	Star Brand Potato and Vegetable Compound	North Haven	78.00
12636	XXXX Fish and Potash Mixture	North Haven	50.00
Wilcox Fertilizer Co., Mystic, Conn.			
12585	Fish and Potash	Branford	62.00
12950	4-8-4 Fertilizer	Factory .....	....
12944	High Grade Fish and Potash	Factory .....	....
12619	Potato Fertilizer	Meriden	48.50
12637	Potato, Onion and Vegetable Phosphate	Mystic	61.00
12900	Tobacco Special	Ellington	75.00
S. D. Woodruff and Sons, Orange, Conn.			
12642	Home Mixture	Factory	50.00
<i>Sampled by Purchaser:</i>			
12839	American Agricultural Chemical Co.'s Bradley Fertilizer	Hartford .....	....
12918	Olds and Whipple's Complete Tobacco Fertilizer	Hartford .....	....

If a cutter were available it would pay to cut these stalks and spread evenly and plow under in the fall unless a cover crop had been sown.

LIME-FERTILE AND NITRO-FERTILE.

These are two fertilizers made by the Fertile Chemical Co., Cleveland, Ohio, and entered for sale in the state. Their analyses follow:

12564. Nitro-Fertile. Sampled from stock of Church and Morse, Meriden. Price 60 cents per bottle.

12566. Lime-Fertile. Sampled from stock of A. R. Brewer & Co., Hartford. Price 35 cents for a 5 lb. package.

WITH POTASH—(Concluded).

In nitrates.	Nitrogen.				Phosphoric Acid.								Potash.			Station No.
	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Water-soluble.	Citrate-soluble.	Citrate-insoluble.	Total.		"So-called "Available."		As muriate.	Total.	Guaranteed.	
				Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.				
0.19	2.08	0.16	1.59	4.02	4.11	2.28	2.30	0.67	5.25	5.00	4.58	4.00	0.45	1.94	2.00	12937
0.16	2.12	0.22	1.62	4.12	4.11	2.84	1.95	0.38	5.17	5.00	4.79	4.00	0.20	1.07	1.00	12938
0.69	0.95	0.35	1.00	2.99	3.29	7.32	1.49	0.78	9.59	9.00	8.81	8.00	0.35	1.10	1.00	12939
0.80	0.23	0.08	0.58	1.69	1.65	5.44	3.67	0.95	10.06	9.00	9.11	8.00	0.31	1.01	1.00	12940
0.11	2.41	0.30	0.98	3.80	3.29	5.37	3.35	0.27	8.99	9.00	8.72	8.00	0.80	2.90	3.00	12583
....	1.20	0.29	0.58	2.07	1.65	4.40	2.83	0.23	7.46	9.00	7.23	8.00	0.20	0.81	1.00	12636
0.11	0.30	0.45	1.81	2.67	2.46	6.26	2.32	0.59	9.17	9.00	8.58	8.00	1.41	1.41	1.00	12585
1.40	0.26	0.39	1.38	3.43	3.30	5.28	3.28	2.98	11.54	9.00	8.56	8.00	3.38	4.10	4.00	12950
0.09	0.34	0.49	2.12	3.04	2.46	2.01	6.37	2.78	11.16	9.00	8.38	8.00	0.31	3.36	3.00	12944
0.76	0.12	0.10	0.79	1.77	1.65	6.12	2.94	0.79	9.85	9.00	9.06	8.00	2.23	2.23	2.00	12619
0.56	0.91	0.27	1.52	3.26	3.30	7.31	2.21	0.64	10.16	10.00	9.52	9.00	1.28	1.28	1.00	12637
0.51	0.64	....	3.00	4.15	4.11	1.71	3.85	4.61	10.17	5.00	5.56	4.00	1.00	1.46	1.00	12900
1.11	0.09	0.16	1.71	3.07	3.29	6.66	5.03	2.58	14.27	....	11.69	8.00	....	0.16	1.00	12642
....	....	....	....	4.61	4.53	0.43	4.38	0.10	4.91	4.00	4.81	3.00	0.52	*3.13	3.00	12839
....	....	....	....	4.20	4.11	0.49	3.42	0.31	4.22	3.00	3.91	3.00	0.48	1.54	1.00	12918

* 2.19 as carbonate.

ANALYSES.

	12564		12566	
	Found	Guaranteed	Found	Guaranteed
Nitrogen as nitrates	2.52	...	....	...
total	2.52	2.0	....	...
Phosphoric acid	3.70	3.0	3.03	3.0
Potash calculated as sulphate ...	1.47	...	....	...
as muriate	3.27	...	....	...
total	4.74	3.0	....	...

SHEEP MANURE.

Ten samples were analyzed as follows:

12758. Pulverized Sheep Manure. Sold by American Agricultural Chemical Co., New York City. Stock of Geo. E. Ackley Co., New Milford.

12521. Liberty Brand Sheep Manure. Sold by Apothecaries Hall Co., Waterbury. Stock of Chas. A. Templeton, Waterbury.

12596. Sheep Manure. Sold by Armour Fertilizer Wks., Chrome, N. J. Stock of F. S. Bidwell & Co., Windsor Locks.

12809. Ground Sheep Manure. Sold by Berkshire Fertilizer Co., Bridgeport. Stock of C. Buckingham, Southport.

12805. Magic Brand Pulverized Sheep Manure. Sold by Chicago Feed and Fertilizer Co., Chicago, Ill. Stock of The F. S. Platt Co., New Haven.

12952. Sheep Manure. Sold by Mid-West Potash and Fertilizer Co., Omaha, Neb. Stock of S. D. Woodruff & Sons, Orange.

12724. "Sheeps Head" Pulverized Sheep Manure. Sold by Natural Guano Co., Aurora, Ill. Stock of Rackliffe Bros. Co., New Britain.

12727. Wizard Brand. Sold by Pulverized Manure Co., Chicago, Ill. Stock of Lightbourn & Pond Co., New Haven.

12490. Sheep Manure. Sold by Natural Guano Co., Aurora, Ill. Sampled and sent by Cadwell & Jones, Hartford.

12674. "Magic" Sheep Manure. Sold by Chicago Feed and Fertilizer Co., Chicago, Ill. Sampled and sent by F. F. Hitchcock, Woodbury.

ANALYSES OF SHEEP MANURE.

Station No.	12758	12521	12596	12809	12805	12952	12724	12727	12490	12674
<i>Per cent. of</i>										
Nitrogen as nitrates .....	.....	.....	0.38	.....	.....	.....	0.16	0.09	.....	.....
" " ammonia	0.30	0.12	0.14	0.37	0.10	.....	0.29	0.19	0.18	.....
" organic	1.72	1.70	1.48	2.08	1.34	.....	1.93	1.83	2.34	.....
" total found	2.02	1.82	2.00	2.45	1.44	1.26	2.38	2.11	2.52	1.96
" " guaranteed..	2.06	2.00	1.65	1.70	1.85	.....	2.25	1.80	.....	2.67
Phosphoric acid, water-soluble	0.35	0.36	0.15	0.12	0.29	0.28	1.14	0.58	1.09	.....
Phosphoric acid, citrate-soluble	1.34	0.99	1.48	0.44	0.84	1.01	0.98	0.96	0.72	.....
Phosphoric acid, citrate-insoluble	0.46	0.22	0.14	0.12	0.15	0.12	0.13	0.12	0.10	.....
Phosphoric acid, total found	2.15	1.57	1.77	0.68	1.28	1.41	2.25	1.66	1.91	1.62
Phosphoric acid, total guaranteed	1.25	1.50	1.00	1.00	1.50	.....	1.00	1.00	.....	2.84
Water-soluble potash found	2.71	2.13	4.41	1.91	2.46	1.46	2.48	2.34	2.85	2.71
Water-soluble potash guaranteed	1.00	2.00	2.50	1.00	1.25	.....	1.50	1.00	.....	1.25
Chlorine	1.10	0.33	1.34	0.17	0.72	0.23	0.56	0.83	.....	.....
Cost per ton	\$46.00	42.00	46.00	44.00	50.00	.....	55.00	55.00	46.00	45.00

The average composition and cost per ton of sheep manure as determined from these analyses are as follows:

Nitrogen	1.99
Phosphoric acid	1.63
Potash	2.55
Cost per ton	\$48.00

The agricultural value of fresh manure is largely in the organic matter which it contains in forms that decay quickly and in its bacterial life. The use of dry sheep manure is chiefly in greenhouse work and on lawns.

"WOOD ASHES."

In the table are given 21 analyses of material sold under this name. Six of the samples are certainly not fairly called wood ashes. **12655** has the composition of lime-kiln ashes and **12147** does not contain even as much potash as ordinary lime-kiln ashes.

During the war, wood ashes have been sold on the "unit" basis, a unit being one per cent. or 20 pounds. The price this year has ranged from \$6 to \$6.50 per unit or from 30 to 32½ cents per pound of potash without regard to the lime or phosphoric acid contained in the ashes.

The higher per cent. of phosphoric acid, 6.40, contained in the ashes sold by E. E. Dickinson & Co., **12418**, is explained by the fact that the ashes came from witch hazel brush. The fine twigs carry considerably more phosphoric acid than does mature wood. With reference to **12102** and **12159** Mr. Joynt states that none of the other cars shipped at the same time from the same storehouse showed less than 5.6 per cent. of potash. Sample **12102** was drawn by the director personally with the greatest care to take portions from all accessible parts of the car and the analysis was most carefully checked.

LIME AND LIME-KILN ASHES.

- 13543.** Ground Oyster Shells from S. P. Woodward, Bethany.
12919. Lime ashes. Sent by L. A. Bevan, Danbury. Cost \$15 per ton.
12855. Lime-kiln ashes made by New England Lime Co., Boardman. Sent by Howard I. Hine, New Milford. Cost \$12 per ton.

ANALYSES OF WOOD ASHES.

Station No.	Car No. and Dealer or Purchaser.	Insoluble in acid (sand).	Water-soluble potash.	Lime.	Phosphoric acid.	Cost per ton.
12792	C. M. Beach Co., New Milford	4.02	0.84	36.19	0.90	.....
12791	C. M. Beach Co., New Milford	2.35	8.61	32.59	1.50	.....
12342	Car R. I. 56111. Frank Brockett, Suffield	17.30	5.00	30.64	1.94	\$23.00
12748	Conn. Sumatra Tobacco Co., Buckland, No. 1	15.90	1.73	27.62	1.13	.....
12749	Conn. Sumatra Tobacco Co., Buckland, No. 2	14.92	1.77	25.72	1.11	.....
12750	Conn. Sumatra Tobacco Co., Buckland, No. 3	15.22	1.94	26.70	1.11	.....
12418	E. E. Dickinson & Co., Essex	5.45	5.45	46.55	6.40	.....
12620	Car C. P. 149238. Edward Eggert, Hartford	14.02	6.10	33.88	2.30	*
12147	A. N. Farnham, Westville	74.42	0.04	.....	.....	.....
12102	Car 197813. John Joynt, Lucknow, Ont. Henry Fuller, Suffield	10.86	4.47	31.34	1.85	*
12191	John Joynt, Lucknow, Ont. A. R. Ford Co., Suffield	19.93	4.85	29.30	1.91	32.00
12159	John Joynt, Lucknow, Ont. Harvey Fuller, Suffield. B. & O. 183128	13.58	3.94	29.84	3.00	†
12500	John Joynt, Lucknow, Ont. F. L. Harvey, Windsor Locks	11.65	6.94	37.15	2.14	†
12621	John Joynt, Caribou, Me. Griffin Tobacco Co., Inc. N. Bloomfield. Car 6976	13.23	5.92	33.96	2.15	*
12622	John Joynt, Caribou, Me. Griffin Tobacco Co., Inc. N. Bloomfield. Car 1546	10.60	5.62	35.48	2.16	*
12623	John Joynt, Caribou, Me. Griffin Tobacco Co., Inc. N. Bloomfield. Car 14804	15.08	6.30	32.59	2.43	*
12655	Clarence E. Lee, New Milford	4.73	0.86	38.53	0.81	.....
11549	W. L. Mitchell, New Haven. F. J. Beach, Woodmont	11.53	2.92	28.70	1.12	28.00
12432	W. L. Mitchell, New Haven. J. E. Shepard, South Windsor	17.70	3.08	27.63	1.19	20.00
12184	Olds & Whipple, Hartford. Car 3719	9.42	6.27	34.76	2.10	*
12640	Wm. L. Peck, New York. C. E. Daniell, Woodbury	39.20	3.47	23.39	1.41	‡28.00

* \$6.50 per unit of water-soluble potash. † \$6.00 per unit of water-soluble potash. ‡ f. o. b. Brightwood, L. I.

ANALYSES OF LIME AND LIME-KILN ASHES.

Station No.	13543	12919	12855
Water-soluble potash ...	none	3.84	1.95
Lime	40.94	36.86	36.70
Magnesia .....	.....	9.40	14.59

12919 supplies water-soluble potash at 19 cents per pound, relatively a very cheap price. The cost in 12855 is about 30 cents.

SOILS.

A very large number have been tested for acidity but the results are not of any general interest or value.

PEAT AND MUCK.

12164 was sent by M. F. McLaughlin, Bridgeport, 12165 by L. Peterson, East Hartford, and 12146 by T. H. Thorne, superintendent, New Canaan.

These require no further notice.

The samples represented by the first three analyses in the table were sent by Henry H. Witzke, Fairfield. They are from a maple swamp in which the peat is at least 20 feet deep. The three samples were taken at depths of 6, 12 and 18 feet respectively. They consist of peat with very little mixture of soil.

12165 was sent with the question whether it would be good on sandy land. This sample, too, is a rich peat. If used in large amount and well distributed through a sandy soil it would undoubtedly improve its water-holding power though of very little value as a fertilizer. The nitrogen of peat is very inert being the part which has resisted decay and solution.

Peat which has been more than half dried makes one of the best absorbents in the manure trenches, tends to prevent loss of ammonia and improves the manure.

13359 is stated to be everglade soil taken near the southern end of Lake Okeechobee in Florida on which sugar cane and vegetables can be grown very successfully without the use of any fertilizer.

This consists of about equal parts of mineral matter or soil and of peat. It has a higher per cent. of nitrogen than any other of the samples; probably it is never subject to drought and may grow crops for a time without fertilizers or manure.

	12464	12465	12466	12165	12164	13359	12146
<i>As received:</i>							
Water	90.86	86.29	56.28	12.10	17.80	15.33	67.18
Organic and volatile ..	8.62	12.82	39.63	76.32	54.37	42.49	11.95
Ash	0.52	0.89	4.09	11.68	27.83	42.18	20.87
Nitrogen	0.16	0.16	0.11	1.57	1.56	2.00	0.34
Phosphoric acid .....	....	....	....	....	....	0.32	....
Potash .....	....	....	....	....	....	0.23	....
<i>Calculated water-free:</i>							
Organic and volatile ..	94.26	93.49	90.62	86.73	66.15	50.18	36.40
Ash	5.74	6.51	9.38	13.27	33.85	49.82	63.60
Nitrogen	1.77	1.18	0.25	1.78	1.89	2.36	1.05
Phosphoric acid .....	....	....	....	....	....	0.38	....
Potash .....	....	....	....	....	....	0.27	....

VARIOUS MARINE FERTILIZERS.

12471, Dried Sea Kelp and 12657, Dried Ground Mussel bed, both prepared by E. J. Eaton, New London.

13474, Cove Mud and 13475, Channel Weed, sent by E. E. Knapp, Essex.

ANALYSES.

	12471	12657	13474	13475
Water .....	....	....	2.89	5.55
Organic and volatile .....	....	....	7.57	26.02
Mineral matter .....	....	....	89.54	68.43
Nitrogen	1.23	1.33	0.38	1.30
Phosphoric acid	0.35	0.32	0.26	0.49
Potash	2.54	0.14	0.57	0.77

The plant food in the dried kelp and dried mussel bed is probably quite readily available to crops. Whether either can profitably be used depends altogether on the cost of getting out the material and transporting it. Kelp was formerly used with profit on some seashore farms where it was abundant and the haul to the land was short. The best results were got where it was hauled at once to the land and immediately plowed in. The same probably applies to channel weed 13475.

With regard to 13474 Mr. Knapp says there is a limitless quantity, not over 1000 feet from porous land needing amendment.

It is a fine material not unlike ordinary soil, as far as the analysis indicates, having in the water-free material only 7.8 per cent. of organic matter.

The percentages of nitrogen and phosphoric acid are also small. Marine mud hauled out in the fall and allowed to stand over winter has been found to have considerable value as an amendment and fertilizer. It cannot be recommended as certainly profitable in any case but is worth a trial on a small scale.

VARIOUS NITROGENOUS WASTE PRODUCTS.

11818. Sent by B. W. Ellis, Co. Agent, Rockville. This is material which has been used as a bird food and as such sold for about \$90 a ton. It contained 6.98 per cent. of nitrogen and 3.84 of phosphoric acid. Probably both are in available form and if so the price would not be more nearly prohibitive of its use as a fertilizer than is the present price of cotton seed meal.

12461. Sent by H. Hawkes, Sound Beach, is stated to be from a dressed beef company and contained 7.16 per cent. of nitrogen.

12773, Skin Choppings and Hair, contained 9.40 per cent. nitrogen. **12774,** Dyed Waste Fur, contained 11.68 per cent. Both samples were sent by G. M. Reynolds, Glennville. Neither of them is of much agricultural value in their present shape.

12961. Shavings from Lace Leather, sent by Jewell Belting Co., Hartford, contained 11.85 per cent. nitrogen of little agricultural value.

11724 and **11725.** Cotton by-products from American Sumatra Tobacco Co., East Hartford.

13370. Fertilizer from Willy Waldag, Suffield. **12704** and **12705** from Hyman Botwinik, Colchester, stated to be made by Shay of New London. **13473,** sent by B. W. Ellis, Co. Agent, Putnam, stated to be Berkshire Fertilizer. **12797,** sent by W. A. Bertini, Granby, marked "Hayti," bought of Berkshire Fertilizer Co. **12882,** a fertilizer sold by the Quality Seed Store, Stamford. Sent by A. F. Aulick, Stamford. **13253,** fertilizer from J. L. Crowley, Westerly, R. I.

ANALYSES.

	11724	11725	13370	12704	12705	13473	12797	12882	13253
<i>Per cent. of</i>									
Nitrogen	1.78	1.42	0.78	4.76	3.18	3.51	3.91	1.25	4.95
Phosphoric acid 0.82	0.80	0.87	14.43	11.64	...	...	12.82	...	...
Potash	1.55	1.19	1.81	0.34	0.42	...	...	1.43	...

Two samples marked Sewage Sludge were examined.

12493 received from Andrew Ure, Highwood, contained nitrogen 0.28, phosphoric acid 0.22 and sand and soil 78.20 per cent. **13360,** sent by Frank Bachmann, New Haven, stated to be made by the Independent Dye Co., Long Island, contained 16.35 per cent. of phosphoric acid.

13472. Stated to be Wilcox Fertilizer Co.'s 4-8-4 Potato Fertilizer. Sent by Wm. Inderelst, Mystic, with request to test for borax. It was found to contain about 0.29 per cent. of boric acid.

VITAMITE.

13372. Sold by John R. Keefe, Newark, N. J. This claims to be "a new bacterial culture, unlike others on the market." This station is not equipped to make bacterial examinations. Of

plant food Vitamite contains 1.42 per cent. nitrogen, 0.90 of phosphoric acid and 1.26 of potash. Sand and mineral matter amounted to 65.30 per cent.

A sample of "Slag," sent by Dr. J. H. Potts, New Britain, **13323**, contained 2.68 per cent. of difficultly soluble phosphoric acid.

A sample of bleaching powder, **13398**, sent by Thames Dyeing and Bleaching Co., New London, had 19.27 per cent. available chlorine. Totally unfit for agricultural use.

12948. Sent by L. M. Benham, Highwood, as a potash fertilizer from New Jersey, probably a Sand Marl, contained 2.88 per cent. of potash soluble in strong acid, of which only 0.11 per cent. was soluble in water.

13405. Sent by Robt. A. Warner, Westville, who states that it is a marl mined at Disputanta, Va., which is sold to local farmers at \$6.50 per ton.

It contained

Phosphoric acid	0.03
Water-soluble potash	0.02
Total potash	0.11
Lime	47.34
Insoluble in acid	10.55

12094. A fertilizer referred to the station for analysis in a disagreement between chemists was found to contain 1.22 per cent. of nitrogen.