BULLETIN 261 NOVEMBER, 1924

Connecticut Agricultural Experiment Station
New Haven, Connecticut

FERTILIZER REPORT

FOR

1924

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Fertilizer Report for 1924

E. M. BAILEY, *Chemist in Charge of the Analytical Laboratory.*

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November, 1924.

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Report on Commercial Fertilizers, 1924.

E. M. BAILEY, *Chemist in Charge, Analytical Laboratory.*

THE FERTILIZER LAW.

The provisions of the fertilizer law have been discussed in previous reports but for more ready reference the essential features may be repeated.

SIGNIFICANCE OF THE TERM "COMMERCIAL FERTILIZERS"

Explaining what is meant by the term "commercial fertilizers" the law says:

"The term 'commercial fertilizers' shall be construed to mean any and every substance imported, manufactured, prepared or sold for fertilizing or manuring or soil amendment purposes, except barnyard manure and stable manure which have not been artificially treated or manipulated, marl and lime. Cottonseed meal, rapeseed meal, castor pomace and all other vegetable products used as fertilizers, including the ashes of cotton hulls and wood ashes, shall be included as fertilizers within the meaning of this act and separate analysis fees shall be paid on each different grade which is sold or offered for sale in the state. The person responsible for paying the fees above prescribed may deduct from the total tonnage sold such sales of cottonseed meal or other vegetable products as are made to anyone who gives a written certificate on a form supplied by the Connecticut Agricultural Experiment Station stating that the material bought by him was to be used exclusively for feed and not for fertilizer."

CONCERNING COTTONSEED MEAL.

Cottonseed meal is a fertilizer within the meaning of the Statute but it is provided that when this product is sold for feeding purposes only, it shall be exempt from the tonnage tax.

The status of cottonseed meal under the fertilizer law has been clearly stated in a bulletin[1] from this Station from which the following may be quoted:

Registration and analysis fees. "Each brand of cottonseed meal must be registered on forms provided by this Station and an analysis fee of ten dollars paid on it before it is sold, offered or exposed for sale, and on the first day of January annually thereafter.

"A distinctive name constitutes a distinct brand. If shipments have different guaranties of composition they are held to be different brands."

Branding or tagging. "Since nitrogen is the only fertilizer ingredient considered in the trade in cottonseed meal no guaranty of phosphoric acid or potash is required. If either is guaranteed by the manufacturer, however, an additional fee of ten dollars must be paid on each element. The statement of composition now legal for feeds may be used hereafter if the percentage of nitrogen is stated.

[1] Bull. of Information No. 9, 1919.

"Note that the law regarding feeding stuffs forbids the use of metal in attaching tags and requires that each package shall be branded or tagged with the statement required by law."

Duties of shippers. "It is assumed from correspondence with shippers outside the state that they will register the brands which they sell in Connecticut, will pay analysis fees as has been done in the past by manufacturers of commercial fertilizers, and will semi-annually thereafter pay the tonnage fees.

"They will report to this Station their total sales and, if they wish, may report what part has been sold for feed exclusively. From the reports of dealers within the state it will be possible to determine quite closely the amounts of each brand actually used as feed.

"In the case the jobber outside the state neglects or refuses to register a brand, the dealer who sells it within the state is responsible under the law."

Duties of dealers. "Dealers are required to file with the director of the Station on July first of each year and semi-annually thereafter a sworn statement of their total sales of each brand of cottonseed meal and the amount of each sold exclusively for feed, during the preceding six months."

Requirements to be Complied with by Sellers of Commercial Fertilizers.

The seller is responsible for the proper labeling of each package, for the registration at the Station of every brand sold by him and for the payment of the analysis fee, before offering for sale, and annually thereafter on January 1st.

The law specifies the information which shall be given on the label as follows:

1. *Weight of each package in pounds.*
2. *Brand name or trade mark.*
3. *Analysis:*
   - (a) *Available phosphoric acid, per cent.*
   - (b) *Total phosphoric acid, per cent.*
   - (c) *Nitrogen, per cent.*
   - (d) *Equivalent ammonia, per cent.*
   - (e) *Potash soluble in water, per cent.*
4. *Name and address of the manufacturer or of the person who is responsible for the statements of the guaranty.*

In the case of bone meal, tankage or other organic products, and in basic slag and mineral phosphates in which a large percentage of the phosphoric acid is not available by laboratory methods, the phosphoric acid shall be claimed as total phosphoric acid unless it is desired to claim available phosphoric acid instead, in which case the guaranty shall take the form set forth above.

The label may be a tag attached to the package or a statement printed thereon. Percentages shall be minimum percentages only.

The presence of leather in its various forms, wool waste, hair or any inert nitrogenous material shall be declared on the label unless, by processing, the activity of these materials has been rendered satisfactory as determined by official methods.

When potash is derived from sulphate or carbonate of potash it may be so claimed.

No claim or guaranty for less than 0.82 per cent of nitrogen, or for less than 1 per cent of phosphoric acid, or for less than 1 per cent of potash shall be regarded in the registration or analysis of any commercial fertilizer.

The seller must also, on the 1st of January and July, report the tonnage of fertilizer sold within the preceding six months and pay to the director of the Station a tonnage fee of 6 cents per ton.

On request, copies of the law and blanks for registration and for tonnage reports will be supplied by the Station.

If, however, proper labeling, registration and payments have been provided for by the manufacturer of the brands or by another responsible person, all sellers of such brands are released from the above mentioned requirements. The retailer, therefore, should assure himself that the requirements of the law have been met by the manufacturers of the brands which he handles, or himself be prepared to meet all these requirements.

Precautions to be Observed in Drawing Samples for Analysis.

The analysis of a fertilizer is of no value unless the sample analyzed represents as nearly as possible the stock from which the sample was drawn. The law prescribes the procedure to be followed by authorized agents of this Station when taking official samples for analysis as follows:

"When samples are taken from fertilizers in bags, a tube shall be used, and it shall be inserted at one end of the bag and shall pass substantially the entire length of the bag, so as to take a core of the material being sampled from substantially the entire length of the bag. Samples thus taken from individual bags shall be thoroughly mixed, and the official samples shall be taken from the mixture so drawn by the method known as 'quartering'. Samples of fertilizer taken as herein provided shall be taken from at least five per centum of the separate original unopened packages in the lot, for the mixture from which the official samples shall be taken. If less than one hundred bags are in the lot, at least five bags shall be sampled; if less than five bags, all shall be sampled. Broken packages shall not be sampled."

Gratuitous Analyses.

Under the fertilizer law the Station is charged only with the analysis of samples drawn by its own agents. It does, however, each year analyze a considerable number of samples drawn by individuals, representing stock purchased by them for their own use. The object of the purchaser is to satisfy himself as to whether he has obtained goods of the grade represented and, perhaps, to obtain evidence upon which to base a claim for shortage should the materials not meet their guaranties. The Station assumes no responsibility for the sampling in case of such unofficial samples

and can only vouch for the accuracy of the results obtained on the materials as submitted. Since a representative sample is as essential as an accurate analysis in judging the quality of a shipment of fertilizer, it is evident that a satisfactory adjustment will seldom be effected on the basis of an unofficial sample. Notwithstanding certain objections which may be raised to the practice of analyzing samples submitted by individuals, the Station is disposed to continue such work so long as there is evidence that it constitutes a useful service; it cannot, however, undertake for any one individual or group, work in such volume or with such frequency that it becomes a systematic control over current purchases. This clearly invades the field of the commercial laboratory.

REGISTRATIONS.

Late Registrations for 1923.

To the brands registered for 1923 in our last report should be added:

Standard Agricultural Chemical Corporation, 2 Rector Street, New York, N.Y.

Prepared Alphano Humus

Registrations for 1924.

For 1924, 56 individuals and firms registered at this Station for sale in this State 433 brands of fertilizers. As required by Statute the brands so registered are listed as follows:

Aben Hardware Co., 74-78 Bank Street, New London, Conn.

5–10–5 Fertilizer

American Agricultural Chemical Co., 2 Rector Street, New York, N. Y.

Agrico Tobacco Manure
Castor Pomace
Cereal Mixture
Complete Potato Mixture
Corn Favorite
Double A Tobacco Fertilizer
Double Manure Salts
Dry Ground Fish
Fine Ground Bone
Fish and Potash
Five–Four–Three Tobacco Fertilizer
Grass and Lawn Top Dressing
Hercules Top Dresser
High Grade Acid Phosphate
Nitrate of Soda
Pulverized Sheep Manure
7% Potash Fertilizer
Sulphate of Potash
Universal Phosphate

Bradley's Complete Manure for Potatoes and Vegetables
Bradley's Complete Tobacco Manure
Bradley's Corn Phosphate
Bradley's New Method Fertilizer
Bradley's Northland Potato Grower
Bradley's Potato Fertilizer
Bradley's Potato Manure
Bradley's Superior Tobacco Compound
Bradley's XL Superphosphate of Lime
Lister's Complete Tobacco Manure
National Complete Tobacco Fertilizer
National Eureka Potato Fertilizer
National Market Garden Fertilizer
National Potato and Corn Phosphate
National Premier Truck Manure
National Special Tobacco
National White Ash Tobacco Grower
National XXX Fish and Potash
Quinnipiac Corn Manure
Quinnipiac Market Garden Manure
Quinnipiac Potato Phosphate
Quinnipiac Prime Tobacco Manure
Quinnipiac Seed Leaf Tobacco Manure
Wheeler's Corn Fertilizer
Wheeler's Cuban Tobacco Grower
Wheeler's Potato Manure
Wheeler's Universal Mixture
Patapsco 5–8–7 Fertilizer
Patapsco 4–8–7 Fertilizer
Patapsco General Truck Fertilizer
Patapsco Matchless Potash Manure
Patapsco Peerless Potato Guano
Patapsco 16% Acid Phosphate

Apothecaries Hall, Co., Waterbury, Conn.

Acid Phosphate
Animal Tankage (9.5–3)
Animal Tankage (7–5)
Bone and Meat Tankage
Bone Meal
Carbonate Potash 62%
Castor Pomace
Double Sulphate Potash and Magnesia 26% K_2O
Fish
Liberty Corn, Fruit and All Crops
Liberty Fish, Bone and Potash
Liberty High Grade Market Gardeners
Liberty High Grade Tobacco Manure
Liberty Market Gardeners Special
Liberty Tobacco Special
Liberty Top Dresser for Grass and Grain
Liberty 2-8-2
Muriate Potash
Nitrate Soda and Potash
Nitrate Soda
Precipitated Bone
Sulphate Potash
Tankage 9-9

Armour Fertilizer Works, 305 Broadway, New York, N. Y.

Armour's Big Crop Acid Phosphate 16%
Armour's Big Crop Fertilizer 8-6-6
Armour's Big Crop Fertilizer 5-8-5
Armour's Big Crop Fertilizer 5-8-7
Armour's Big Crop Fertilizer 4-8-4
Armour's Big Crop Fertilizer 4-6-10
Armour's Big Crop Fertilizer 3-8-4
Armour's Big Crop Fertilizer 2-12-2
Armour's Big Crop Tobacco Special 5-4-5
Armour's Corn Grower 2-8-2
Bone Meal 3-48
Ground Tankage 9-15
Muriate of Potash 48%
Nitrate of Soda 18%
Raw Bone Meal 4.5-47
Sheep Manure 1.5-1-2
Sulphate of Ammonia 25%
Sulphate of Potash 48%

Ashcraft-Wilkinson Company, Trust Co. of Georgia Building, Atlanta, Georgia.

Helmet Brand Prime Cotton Seed Meal
Monarch Brand Prime Cotton Seed Meal
Paramount Brand Prime Cotton Seed Meal

Atlantic Packing Co., New Haven, Conn.

Atlantic 5-8-7
Atlantic 4-8-6
Atlantic Grain Fertilizer 2-8-2
Atlantic Potato Phosphate 3-8-4
Atlantic Special Vegetable 4-8-4
Atlantic Tobacco Grower 5-4-5
Atlantic Tobacco Manure 5-8-6
Atlantic 7-5-4

Baker Castor Oil Company of New Jersey, 120 Broadway, New York, N. Y.

Castor Pomace

Barrett Co., 40 Rector St., New York, N. Y.

Arcadian Sulphate of Ammonia

F. A. Bartlett Tree Expert Co., Stamford, Conn.

Bartlett's Green Tree Food

Berkshire Fertilizer Co., Bridgeport, Conn.

Acid Phosphate
Berkshire Castor Pomace
Berkshire Complete Fertilizer
Berkshire Complete Tobacco
Berkshire Dry Ground Fish
Berkshire Economical Grass Fertilizer
Berkshire Fine Ground Bone
Berkshire Grass Special
Berkshire Long Island Special
Berkshire Market Garden
Berkshire Potato and Vegetable Phosphate

Berkshire Sheep Manure
Berkshire Tobacco Special
Double Manure Salt
Ground Tankage
High Grade Sulphate of Potash
Muriate of Potash
Nitrate of Soda
Precipitated Bone Phosphate
Wool Waste

F. E. Boardman, Middletown, Conn.

Boardman's Complete Fertilizer for Potatoes and General Crops
Boardman's Tobacco Fertilizer.

Bowker Fertilizer Company, 60 Trinity Place, New York, N. Y.

Bowker's All Round Fertilizer
Bowker's Connecticut Valley Tobacco Fertilizer
Bowker's Corn, Grain and Grass Phosphate
Bowker's Fisherman's Brand Fish and Potash
Bowker's Market Garden Fertilizer
Bowker's Potato and Vegetable Phosphate
Bowker's 16% Acid Phosphate
Bowker's Square Brand Farm and Garden Phosphate
Bowker's Sure Crop Phosphate
Stockbridge Early Crop Manure
Stockbridge Potato and Vegetable Manure
Stockbridge Premier Tobacco Grower
Stockbridge Tobacco Manure
Stockbridge Top Dressing and Forcing Manure
Stockbridge Truck Manure

Bridge's Sons, Inc., Amos D., Hazardville, Conn.

Corn, Onion and Potato and General Purpose
Special Tobacco Fertilizer

Buckeye Cotton Oil Company, Cincinnati, Ohio.

"Buckeye" 36% Protein Cottonseed Meal—Good Quality

Chittenden Co., E. D., Bridgeport, Conn.

Chittenden's Acid Phosphate
Chittenden's Castor Pomace
Chittenden's Complete Grain
Chittenden's Dry Ground Fish
Chittenden's Ground Bone
Chittenden's High Grade Tobacco
Chittenden's Nitrate of Soda
Chittenden's Potato Special 4% Potash
Chittenden's Potato Special 6% Potash
Chittenden's Tobacco Special
Chittenden's Top Dresser
Chittenden's Vegetable and Onion Grower
Chittenden's Complete Tobacco and Onion Grower, 4% Potash

Clark Seed Co., Everett B., Milford, Conn.

Acid Phosphate 16%
Clark's Special Mixture for General Use
Clark's Special Mixture with 6% Potash
Clark's Tip Top Brand 5-8-5
Nitrate of Soda

Coe-Mortimer Co., 2 Rector Street, New York, N. Y.

E. Frank Coe's Celebrated Special Potato Fertilizer
E. Frank Coe's Columbian Corn and Potato Fertilizer
E. Frank Coe's Connecticut Wrapper Grower
E. Frank Coe's Gold Brand Excelsior Guano
E. Frank Coe's New Englander Special
E. Frank Coe's Red Brand Excelsior Guano
E. Frank Coe's 16% Superphosphate
E. Frank Coe's Special Grass Top Dressing
E. Frank Coe's Standard Potato Fertilizer

Connecticut Fat Rendering & Fertilizing Corporation, West Haven, Conn.

Tankage

Consolidated Rendering Co., 40 North Market Street, Boston (9), Mass.

Acid Phosphate 16%
Ground Bone (2.50-26)
Ground Bone (3.00-24)
Muriate of Potash
Nitrate of Soda
Sulphate of Ammonia
Sulphate of Potash
Tankage 6-30
Tankage 9-20

Cowles, C. A., Plantsville, Conn.

C. A. Cowles 4-8-4 Fertilizer

Davis, S. P., 207 Southern Trust Building, Little Rock, Arkansas.

Beauty Cottonseed Meal
Goodluck Brand Cottonseed Meal and Cracked Screened Cake
Steerboy Brand Cottonseed Meal and Cracked Screened Cake

Eastern States Farmers' Exchange, 33 Lyman Street, Springfield, Mass.

Acid Phosphate 16%
Castor Pomace
Eastern States 4-8-4
Eastern States 6-3-5
Eastern States 6.25-3-5
Eastern States 7-2-7
Eastern States 3-12-3 No-Filler
Eastern States 5-8-7 No-Filler
Eastern States 5-10-5 No-Filler
Eastern States 7-8-3 No-Filler
Eastern States Dry Ground Fish
Eastern States Fine Bone Meal
Eastern States Sulphate of Potash
Ground Animal Tankage
Muriate of Potash
Nitrate of Soda Reground
Sulphate of Ammonia

Essex Fertilizer Company, 39 North Market Street, Boston, Mass.

Essex Fish Fertilizer for All Crops 3-8-4
Essex 5-8-7 for Potatoes and Vegetables
Essex 4-6-10 for Potatoes and Vegetables
Essex Market Garden for Potatoes, Roots and Vegetables 4-8-4
Essex Potato Phosphate 4-8-7 for Potatoes and Vegetables

Essex Special Tobacco 5-4-5
Essex Tobacco Manure 5-8-6
Essex 2-8-3 for All Crops
Essex 2-8-2 for Farm and Garden

Frisbie Co., L. T., New Haven, Conn.

Castor Pomace
Dry Ground Fish
Frisbie's Bone Meal
Frisbie's Corn and Grain Fertilizer 2-8-2
Frisbie's 5-8-7
Frisbie's Market Garden 4-8-6
Frisbie's Special 4-10-6
Frisbie's Special 3-8-4
Frisbie's Special Vegetable and Potato Grower 4-8-4
Frisbie's Tobacco Grower 5-4-5
Frisbie's Tobacco Manure 5-8-6
Frisbie's Top Dresser 7-5-4

Humphreys-Godwin Co., Inc., Memphis, Tennessee.

Bull Brand Cottonseed Meal
Danish Brand Cottonseed Feed
Dixie Brand Cottonseed Meal

International Agricultural Corporation (Buffalo Fertilizer Works),Boston, Mass.

Buffalo Crop Grower
Buffalo General Favorite
Buffalo High Grade Manure
Buffalo New England Special
Buffalo Phosphate and Potash
Buffalo Sixteen Per cent.
Buffalo Tobacco Producer
Dry Ground Fish
I. A. C. Connecticut Valley Special
International Double Strength 10-8-10

Joynt, John, Lucknow, Ontario, Canada.

The Joynt Brand Canada Unleached Hardwood Ashes

Lovitt & Co., L. B., Memphis, Tennessee.

Lovit Brand Cottonseed Meal 5.75%
Lovit Brand Cottonseed Meal 6.58%
Lovit Brand Cottonseed Meal 6.88%

Lowell Fertilizer Company, 40 North Market St., Boston, Mass.

Lowell Animal Brand, a High Grade Manure for All Crops 3-8-4
Lowell Bone Fertilizer, For Corn, Grain, Grass and Vegetables 2-8-2
Lowell 5-8-7 for Potatoes and Vegetables
Lowell 4-8-4 for Potatoes, Corn and Veg.
Lowell 4-6-10 for Potatoes and Vegetables
Lowell Potato Phosphate for Potatoes and Vegetables 4-8-7
Lowell Tobacco 5-4-5 for Tobacco, Fruits and Vines
Lowell Tobacco Manure 5-8-6
Lowell Top Dressing 7-5-2

Mapes Formula & Peruvian Guano Co., 110 William St., New York, N. Y.

The Mapes Connecticut Valley Special
The Mapes Corn Manure
The Mapes C. S. Tobacco Manure
The Mapes General Tobacco Manure
The Mapes General Truck Manure
The Mapes General Use Manure
The Mapes Grain Brand
The Mapes Onion Manure
The Mapes Potato Manure
The Mapes Tobacco Ash Constituents
The Mapes Tobacco Manure—Wrapper Brand
The Mapes Tobacco Starter Improved
The Mapes Top Dresser

Memphis Cottonseed Products Co., Inc., 1015 Falls Building, Memphis, Tennessee.

Durham Thirty-Six

Mitchell, Walter L., 699 Forest Road, New Haven, Conn.

Mitchell's 5-8-7
Mitchell's Tennessee Phos-Pho-Flour

Natural Guano Company, Aurora, Illinois.

"Sheep's Head" Pulverized Sheep Manure

Neal & Co., Inc., R. N., Memphis, Tennessee.

"Triangle" Brand Prime 36% Protein.
"Triangle" Brand Prime 41% Protein
"Triangle" Brand Prime 43% Protein

New England By-Products Corp., 20 West Street, Lawrence, Mass.

Ground Steamed Bone
Pure Bone Meal

New England Fertilizer Co., 40A North Market Street, Boston, Mass.

Fish
New England Corn Phosphate for Grain and Vegetables 2-8-2
New England 5-8-7 for Potatoes and Market Gardens
New England 4-8-4 for Potatoes, Vegetables and Grass
New England Potato Phosphate 4-8-7 for Potatoes and Vegetables
New England Superphosphate, a High-Grade Fertilizer for all Crops, 3-8-4
New England Tobacco 5-4-5
New England Tobacco Manure 5-8-6
New England 2-8-3 for Vegetables and Grain

Nitrate Agencies Company, Bound Brook, N. J. (104 Pearl St., New York, N. Y.)

Naco Brand 2-8-2
Naco Brand 4-8-4
Naco Brand 4-8-7
Naco Brand 5-8-7
Naco Brand Acid Phosphate
Naco Brand Animal Tankage
Naco Brand Castor Pomace
Naco Brand Fish
Naco Brand Muriate of Potash

Naco Brand Nitrapo
Naco Brand Nitrate of Soda
Naco Brand Peruvian Guano
Naco Brand No. 12 Peruvian Guano Mixture
Naco Brand No. 14 Peruvian Guano Mixture
Naco Brand No. 50 Peruvian Guano Mixture
Naco Brand Equivalent 5-8-7 Genuine Peruvian Guano Mixture
Naco Brand Raw Bone Meal
Naco Brand Steamed Bone Meal
Naco Brand Sulphate of Ammonia
Naco Brand Sulphate of Potash

Olds & Whipple, Inc., Hartford, Conn.

Double Manure Salts
H G Sulphate of Potash
Nitrate of Soda
O & W Acid Phosphate
O & W Blue Label Tobacco Fertilizer
O & W Bone Phosphate and Potash Compound
O & W Castor Pomace
O & W Complete Corn, Potato and Onion Fertilizer
O & W Complete Tobacco Fertilizer
O & W Dry Ground Fish
O & W Fish and Potash
O & W H G Potato Fertilizer
O & W H G Starter and Potash Compound
O & W H G Tobacco Starter
O & W Precipitated Bone
O & W Pure Bone Meal
O & W Spec Comp Corn, Onion and Potato Fertilizer
O & W Top Dressing for Grass
Sulphate of Ammonia

Pacific Manure & Fertilizer Co., 429 Davis St., San Francisco, California.

Groz-It Brand Pulverized Sheep Manure

Parmenter & Polsey Fertilizer Co., 41 North Market St., Boston, Mass.

Parmenter & Polsey 5-8-7 for Potatoes and Market Gardens
Parmenter & Polsey 4-8-4 for Potatoes, Corn and Vegetables
"P & P" Plymouth Rock Brand for all Crops 3-8-4

Platt Co., The Frank S., Inc., 450 State Street, New Haven, Conn.

Platco Special 4-8-6

Potash-Marl, Inc., 15 East 40th Street, New York, N. Y.

Potash-Marl

Premier Poultry Manure Company, 431 So. Dearborn St., Chicago, Ill.

Premier Brand Pulverized Poultry Manure
Premier Brand Pulverized Sheep Manure

Pulverized Manure Company, 828 Exchange Ave., Union Stock Yards, Chicago, Ill.

Wizard Brand Manure
Wizard Brand Sheep Manure

Rogers & Hubbard Company, The, Portland, Conn.

Acid Phosphate
Castor Pomace
Cotton Seed Meal
4-8-4 Fertilizer
Garden Fertilizer
Ground Fish
Hubbard's "Bone Base" Fertilizer for Oats and Top Dressing
Hubbard's "Bone Base" Fertilizer for Seeding Down
Hubbard's "Bone Base" Soluble Corn and General Crops Manure.
Hubbard's "Bone Base" Soluble Potato Manure.
Hubbard's "Bone Base" Soluble Tobacco Manure
Hubbard's Pure Raw Knuckle Bone Flour
Hubbard's Strictly Pure Fine Bone
Nitrate of Soda
Richmond's Special
Rogers & Hubbard's All Soils-All Crops Fertilizer
Rogers & Hubbard's Climax Tobacco Brand.
Rogers & Hubbard's Corn and Grain Fertilizer
Rogers & Hubbard's High Potash Fertilizer
Rogers & Hubbard's Potato Fertilizer
Rogers & Hubbard's Tobacco Grower, Vegetable Formula
Sulphate of Potash

Royster Guano Company, F. S., 1604 Munsey Building, Baltimore, Md.

Dry Ground Fish
Muriate of Potash
Nitrate of Soda
Royster's Bully Guano
Royster's Fine Ground Bone Meal
Royster's Quality Trucker
Royster's 16% Acid Phosphate
Royster's Spearhead Guano
Royster's Top Dresser
Royster's Trucker's Delight
Royster's Valley Tobacco Formula
Royster's Wrapper Brand
Sulphate of Ammonia
Sulphate of Potash

Sanderson Fertilizer & Chemical Co., New Haven, Conn.

Sanderson's Acid Phosphate
Sanderson's Atlantic Coast Bone, Fish and Potash
Sanderson's Castor Pomace
Sanderson's Complete Tobacco Grower
Sanderson's Corn Superphosphate
Sanderson's Dry Ground Fish
Sanderson's Fine Ground Bone
Sanderson's Formula A
Sanderson's Formula B
Sanderson's Kelsey's Bone, Fish and Potash
Sanderson's Nitrate of Soda
Sanderson's Potato Manure
Sanderson's South American Sheep and Goat Manure
Sanderson's Top Dressing for Grass and Grain

Shoemaker & Co., Inc., M. L., Venango St. and Delaware Ave., Philadelphia, Pa.

Nitrate of Soda
Shoemaker's Bone Meal
"Swift-Sure" Bone Meal
"Swift-Sure" Crop Grower
"Swift-Sure" Potato No. 1
"Swift-Sure" Tobacco and General Use
"Swift-Sure" Tobacco Special
"Swift-Sure" Tobacco Starter

South Texas Cotton Oil Co., Victoria County, Texas (Agents, M. B. Jones & Co., Inc., Produce Exchange, New York, N. Y.)

43% Protein Cottonseed Meal

Springfield Rendering Company, Springfield, Mass.

Springfield Animal Brand 3-8-4
Springfield Market Garden Grower and Top Dresser
Springfield Special Potato, Onion and Vegetable 4-8-4
Springfield Tobacco Special, 5-4-5

Standard Agricultural Chemical Corporation, 2 Rector St., New York, N.Y.

Prepared Alphano Humus
Super-Alphano

Virginia-Carolina Chemical Company (of Delaware), Equitable Bldg., 120 Broadway (Room 2249), New York, N. Y.

Genuine Imported Kainit
Muriate of Potash
Nitrate of Soda
Pure Raw Bone
Sulphate of Ammonia
V-C Aroostook Potato Grower
V-C Champion Brand
V-C Double Owl Brand
V-C Fish, Phosphate and Potash Brand
V-C Indian Chief Brand
V-C Marvel Brand
V-C Perfection Brand
V-C Tip-Top Brand
V-C Universal Brand

Vitogro Chemical Co., 38 Middle St., Lowell, Mass.

Vitogro for Flowers, Shrubs and Vegetables
Vitogro for Lawns
Vitogro for Vegetables

Wilcox Fertilizer Company, 56 Main Street, Mystic, Conn.

Wilcox Acid Phosphate
Wilcox Corn Special
Wilcox Dry Ground Fish
Wilcox Fish and Potash
Wilcox 5-8-7 Fertilizer
Wilcox 5-10-5 Fertilizer
Wilcox 4-8-4 Fertilizer
Wilcox Grd. Steamed Bone

Wilcox Muriate of Potash
Wilcox Nitrate of Soda
Wilcox Potato and Vegetable Phosphate
Wilcox Tobacco Special

Woodruff & Sons, S. D., Orange, Conn.
Woodruff's Home Mixed Fertilizer

Worcester Rendering Company, Auburn, Mass.
Prosperity Brand Complete Dressing
Prosperity Brand Corn and Grain
Prosperity Brand Ground Tankage
Prosperity Brand Market Garden
Prosperity Brand Potato and Vegetable Fertilizer

INSPECTION OF 1924.

During the year, Mr. Churchill, the sampling agent of the Station, has visited ninety-six towns and villages in the State and has taken 592 official samples of fertilizers which number includes all the registered brands which were found on sale. These together with samples submitted by purchasers or others interested may be classified as follows:

CLASSIFICATION OF FERTILIZERS ANALYZED.

	Number of Samples	Page
I. *Containing Nitrogen as the chief active ingredient:*		
Nitrate of Soda	23	18
Sulphate of Ammonia	10	20
Castor Pomace	58	21
Cottonseed Meal	135	24
Linseed Meal	2	25
II. *Containing Phosphoric Acid as the chief active ingredient:*		
Raw Rock Phosphate	1	31
Precipitated Bone Phosphate	4	31
Dissolved Rock Phosphate or Acid Phosphate	20	31
III. *Containing Potash as the chief ingredient:*		
Carbonate of Potash	13	34
Muriate of Potash	13	34
Sulphate of Potash	26	34
Double Sulphate of Potash and Magnesia	6	40
IV. *Containing Nitrogen and Potash:*		
Nitrate of Potash	1	42
Nitrate of Potash and Soda	3	42
V. *Containing Nitrogen and Phosphoric Acid:*		
Dry Ground Fish	40	42
Tankage	18	43
Ground Bone	26	43
VI. *Mixed Fertilizers:*		
Containing Phosphoric Acid and Potash	2	52
Containing Nitrogen and Phosphoric Acid	3	52
Containing Nitrogen, Phosphoric Acid and Potash	299	53
Special and Home Mixtures	28	85
VII. *Miscellaneous fertilizers, amendments, waste products, etc.:*		
Wood Ashes	20	88
Sheep Manure, etc.	14	88
Sewage Sludge	2	92
Lime	46	92
Miscellaneous	58	100
Total	871	

I. RAW MATERIALS CHIEFLY VALUABLE FOR NITROGEN.

NITRATE OF SODA.

Pure nitrate of soda contains 16.47 per cent of nitrogen. Commercial grades of this salt generally contain from 15 to 16 per cent of nitrogen which is equivalent to from 18.2 to 19.5 ammonia or 91 to 97 per cent nitrate of soda.

Twenty-three samples were examined and the results are given in Table I.

Sample **23039** was considerably under guaranty and a second sample, **23306,** from the same lot was also deficient. Sample **23013** was found to be deficient but a second sample of the same brand taken from a different source was well over the guaranty. Two samples, Nos. **23204** and **23205,** submitted by purchasers, were found to be considerably under the guaranty of 15 per cent nitrogen. The salt was red-brown in color and contained much insoluble matter. The Apothecaries Hall Company, who distributed this chemical, sold in original bags as received by them. They investigated and found that the low grade product constituted but a small part of their entire stock; they were allowed a rebate by the importers from whom they bought and reimbursed their customers accordingly.

Nitrogen from this source has cost from 20.6 to 28.9 cents per pound, the average being about 23.3 cents. Ton prices have ranged from $62.50 to $75.00.

We are uncertain about the guaranties on samples **21899, 21900, 21901** and **21902.** The jobbers claim the goods were guaranteed 15 per cent nitrogen, while the information submitted by the purchasers is that the salt was supposed to analyze 95 per cent nitrate of soda, which is about 15.60 per cent nitrogen. We have no information as to whether any adjustment was made or asked for.

TABLE I. ANALYSES OF NITRATE OF SODA.

Station No.	Manufacturer or Jobber.	Purchased, Sampled or Sent by	Per cent. Nitrogen. Found.	Guaranteed.
22954	Sanderson Fertilizer and Chemical Co., New Haven	Station agent at the factory, New Haven	15.28	15.00
23237	Consolidated Rendering Co., Boston	Station agent. Stock of The L. T. Frisbie Co., New Haven	15.50	15.22
23306	The E. B. Clark Seed Co., Milford	Station agent. Stock of D. L. Clarke & Sons, Milford	13.72	15.00
21900	W. R. Grace Co., New York	American Sumatra Tobacco Co., Bloomfield	15.52	15.60
21899	W. R. Grace Co., New York	" "	15.40	.....
21901	W. R. Grace Co., New York	" "	15.32	.....
21902	W. R. Grace Co., New York	" "	15.24	.....
23141	The L. T. Frisbie Co., New Haven	W. T. Clark, Norwich	15.44	15.00
23067	F. S. Royster Guano Co., Baltimore	Station agent. Stock of W. S. Brown, Trumbull	15.64	15.00
22904	East'n States Farmers' Exchange, Springfield	Station agent. Stock of H. H. McKnight, Ellington	15.22	14.80
23130	Nitrate Agencies Co., Bound Brook, N. J.	Station agent. Stock of Joseph Adams, Westport	14.96	15.00
23197	Wilcox Fertilizer Co., Mystic	Station agent. Stock of M. E. Thompson, Ellington	15.50	15.00
23269	American Agricultural Chemical Co., New York	Station agent. Stock of J. H. Paddock, Wallingford	15.26	15.00
22934	Olds & Whipple, Hartford	Station agent at factory	15.16	15.00
22898	Berkshire Fertilizer Co., Bridgeport	Station agent at factory	15.06	14.80
22899	Apothecaries Hall Co., Waterbury	Station agent. Stock of J. A. Glasnapp, West Cheshire	15.32	14.80
22957	The Rogers & Hubbard Co., Portland.	Station agent at factory	15.16	15.00
23192	Virginia - Carolina Chemical Co., New York	Station agent. Stock of E. O. Chapman, North Haven	15.32	14.80
168	Armour Fertilizer Works, New York	Station agent. Stock of F. L. Wadhams, Torrington	15.72	14.81
23039	E. B. Clark Seed Co., Milford	Station agent. Stock of D. L. Clarke & Sons, Milford	13.26	15.00
23013	Armour Fertilizer Works, New York	Station agent. Stock of F. C. Benjamin, Danbury	14.00	14.81
23205	Apothecaries Hall Co., Waterbury	John H. R. Bishop, Cheshire	12.48	15.00
23204	Apothecaries Hall Co., Waterbury	John H. R. Bishop, Cheshire	12.36	15.00

SULPHATE OF AMMONIA.

Ten samples were examined and the results are given in Table II.

Pure ammonium sulphate contains 21.2 per cent of nitrogen, but the commercial grades usually contain about 20.5 per cent, which is equivalent to about 25 per cent of ammonia or about 97 per cent of ammonium sulphate.

As sold in the State this year this salt has contained from 20.2 to 20.9 per cent of nitrogen. Sample **23240** was a second sample drawn as a check on sample **23146**; both were substantially up to the guaranty. Sample **161** was a check on **23011** and exceeded the guaranty, whereas the first sample was slightly low. Sample **23395** showed a shortage of 0.33 per cent nitrogen. This was a small lot and was not resampled.

According to prices quoted, the cost per pound of nitrogen has ranged from 9.8 to 19.3 cents, the average being 16.6 cents; this is $3.32 per unit of nitrogen, or $2.73 per unit of ammonia. Ton prices have ranged from $40.00 to $79.00.

TABLE II. SULPHATE OF AMMONIA.

Station No.	Manufacturer or Jobber.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
23011	Armour Fertilizer Works, New York..	Station agent. Stock of F. A. Bartlett, Stamford.....	20.36	20.56
23265	Virginia - Carolina Chemical Co., New York.....	Station agent. Stock of Rackliffe Bros., New Britain....	20.54	20.56
23153	Nitrate Agencies Co., New York.....	Station agent. Stock of Jos. Humphreys, Danbury.....	20.56	20.56
23146	L. T. Frisbie Co., New Haven.....	Sent by Walter Clark, Norwich.....	20.40	20.50
22922	Barrett Co., New York.....	Station agent. Stock of Berkshire Fertilizer Co., Bridgeport.....	20.86	20.75
22939	Olds & Whipple, Inc., Hartford.....	Station agent at the factory..	20.80	20.58
23040	F. S. Royster Guano Co., Baltimore.....	Station agent. Stock of W. S. Brown, Trumbull.....	20.50	20.56
161	Armour Fertilizer Works, New York..	Station agent. Stock of F. A. Bartlett, Stamford.....	20.60	20.56
23240	Consolidated Rendering Co., Boston....	Station agent. Stock of L. T. Frisbie Co., New Haven...	20.46	20.50
23395	Eastern States Farmers' Exchange, Springfield.....	Station agent. Stock of H. H. McKnight, Ellington.....	20.22	20.55

CASTOR POMACE.

Castor pomace is the residue left after removing the oil from the castor bean. It is actively poisonous to stock and should be stored with due precautions on that account. As a fertilizer it is used chiefly with cottonseed meal in tobacco mixtures. While valuable chiefly for its nitrogen content it contains also about one per cent of potash and two per cent of phosphoric acid.

Fifty-eight samples were analyzed and the results are given in Table III. Fifteen were sampled by the station agent; the remainder were sampled and submitted by purchasers.

Sample **22813** was submitted by the purchaser and was drawn from three bags. The stock was left over from the previous year but when bought was guaranteed to contain 5 per cent of nitrogen. Sample **22951** was sampled by the station agent from six bags of the lot, and samples **22953** and **22960** were taken from each of two bags which were represented in the original purchaser's sample. The two single bag samples show a variation in nitrogen of about 1 per cent. The entire purchase of the previous year cannot be adequately judged, however, by these samples from the left-over stock.

In general, this material has been sold this year under a guaranty of 4.52 per cent nitrogen, which is equivalent to 5.50 per cent of ammonia. In fifty samples where guaranties are known there were forty in which the guaranties were exceeded and ten in which they were not met; but for the total number there was an average overrun of 0.17 per cent of nitrogen.

At the prices quoted to us, confidentially or otherwise, the average cost per ton is $29.76. The average nitrogen content is 4.75 per cent. Disregarding the potash and phosphoric acid contents, nitrogen has cost 31.3 cents per pound, which is $6.26 per unit of nitrogen or $5.13 per unit of ammonia. *If allowance is made for the potash and phosphoric acid present at the rate of four cents per pound each, then the cost per pound of nitrogen is about 28.8 cents.*

TABLE III. ANALYSES OF CASTOR POMACE.

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	The American Agricultural Chemical Co., New York City.			
22926	.....	Station agent from stock of Geo. S. Phelps & Co., Thompsonville.....	4.77	4.53
	Apothecaries Hall Co., Waterbury, Conn.			
22199	7341.....	Hatheway & Steane, Hartford	5.39	....
22200	35014.....	" "	4.86	....
22201	215754.....	" "	4.66	....
22202	63787.....	" "	4.69	....
22664	11260 P. A. R.....	Spencer Bros., Suffield.....	5.19	4.52
22790	32790 H. O.....	" "	4.79	4.52
22793	238188 N. Y. C.....	" "	5.11	4.52
	Baker Castor Oil Co., New York, N. Y.			
21951	75785.....	American Sumatra Tobacco Co., Bloomfield.....	4 46	4 52
21952	81073.....	" "	4.83	4.52
21965	171752.....	" "	4.81	4.52
21966	153850.....	" "	4.87	4.52
21967	253457.....	" "	4.97	4.52
21968	159471.....	" "	4.58	4.52
21985	47750.....	" "	5.12	4.52
21986	96146.....	" "	4.48	4.52
22250	88268.....	" "	4.19	4.52
22294	255465.....	" "	4.57	4.52
22295	93176.....	" "	4.68	4.52
22296	49563.....	" "	4.45	4.52
22297	12105.....	" "	5.28	4.52
22298	84611.....	" "	4.73	4.52
22354	17980.....	" "	4.36	4.52
22355	153676.....	" "	4.00	4.52
22359	96146.....	" "	5.00	4.52
22360	75785.....	" "	4.53	4.52
22369	34670.....	" "	4.78	4.52
22416	86215.....	" "	5.46	4.52
22419	91929.....	" "	5.11	4.52
22436	102234.....	" "	4.62	4.52
22437	98832.....	" "	4.80	4.52
22438	30002.....	" "	4.29	4.52
22439	88268.....	" "	4.70	4.52
22448	7313.....	" "	4.38	4.52
22449	45963.....	" "	4.76	4.52
22450	80744.....	" "	4.84	4.52

TABLE III. ANALYSES OF CASTOR POMACE—*Continued.*

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	Baker Castor Oil Co., New York, N. Y.			
22464	17980	American Sumatra Tobacco Co., Bloomfield	4.69	4.52
22465	153676	" "	4.30	4.52
22472	261920	" "	4.62	4.52
22786	156063, R. I.	John S. Leonard, Burnside	4.82	4.52
23227		Station agent from stock of Olds & Whipple, Hartford	5.01	4.50
23275		Station agent from stock of F. H. Thrall, Windsor	5.02	4.50
	Berkshire Fertilizer Co. Bridgeport, Conn.			
22813		Station agent from stock of Frank Lanati, Windsor Locks	3.88[1]	....
22872		Station agent from stock of T. W. Ryan, Stratford	4.47	4.50
22951		Station agent from stock of Frank Lanati, Windsor Locks	4.26[1]	....
22952		" "	3.55[1]	....
22953		" "	4.51[1]	....
22960		Station agent from stock of J. E. Lathrop, Burnside	4.63	4.50
	E. D. Chittenden Co., Bridgeport, Conn.			
23270		Station agent from stock of E. J. Bantle, Glastonbury	4.28	4.50
	L. T. Frisbie Co., New Haven, Conn.			
163		Station agent from stock of G. O. Case, Burnside	4.61	4.52
22962		Station agent from stock of T. J. Coleman, Warehouse Point	4.40	4.52
	Nitrate Agencies Co., New York, N. Y.			
23417	Naco	Station agent from stock of E. N. Austin, Suffield	4.65	4.93
	Olds & Whipple, Hartford, Conn.			
22927		Station agent at factory	5.19	4.94

[1] Stock of 1923, omitted from average.

TABLE III. ANALYSES OF CASTOR POMACE—*Concluded.*

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	Olds & Whipple, Hartford, Conn.			
23072	Thum. 48544 M. C. R. R.....	H. E. Wells, Windsor Locks	5.16	4.94
23073	Thum. 226956 N.Y.C.	" "	4.90	4.94
23280	.....	L. Wetstone & Sons, Inc., Hartford.....	5.07	4.52
	The Rogers & Hubbard Co., Portland, Conn.			
22958	.....	Station agent at factory.....	5.05	5.00
	Sanderson Fertilizer & Chemical Co., New Haven, Conn.			
22988	.....	Station agent at factory.....	4.71	4.53

COTTONSEED MEAL.

One hundred and thirty-five samples of cottonseed meal have been analyzed and the results are given in Table IV. The grades may be classified as follows:

36 per cent protein containing 5.76 per cent nitrogen equivalent to 7.00 per cent ammonia, 16 samples.

41 per cent protein containing 6.56 per cent nitrogen equivalent to 8.00 per cent ammonia, 82 samples.

43 per cent protein containing 6.88 per cent nitrogen equivalent to 8.30 per cent ammonia, 17 samples.

Four samples have odd guaranties and for 16 samples no guaranties were submitted. There were no samples bearing a guaranty of 38.56 per cent protein (6.17 per cent nitrogen equivalent to 7.50 per cent ammonia).

Of these samples where guaranties are known 82 equaled or exceeded their guaranties and 36 did not. As an average for all samples there was 0.15 per cent of nitrogen in excess of the guaranty.

Reckoning nitrogen at its average cost as deduced from data obtained this year, viz., 39.1 cents per pound, deficiencies in money value in excess of $1.00 per ton were shown in only 15 samples. This is making no allowance for about 3 per cent of phosphoric

acid and 2 per cent of potash which cottonseed meal normally contains and which are fairly valued at 4 cents per pound each.

So far as we have information as to prices, the cost of nitrogen in cottonseed meal has averaged 39.1 cents per pound, and nitrogen has been purchased at somewhat better advantage in the higher grades as appears in the subjoined summary, Table V.

TABLE V. SUMMARY OF DATA ON COTTONSEED MEAL.

GRADE.	Number of Samples.	Average Nitrogen. %	Average Cost per Ton.	Average Cost of Nitrogen, cents per Pound.
36 per cent (5.76 N)	16	5.79	$48.90[1]	42.2
41 per cent (6.58 N)	82	6.76	51.93[2]	38.4
43 per cent (6.88 N)	17	7.02	55.99[3]	39.2
Odd per cent	4	6.00	....	....
No guaranty	16	6.73	50.59[4]	37.6
Total and averages	135	6.66	52.13[5]	39.1

LINSEED MEAL.

Two samples purchased by Hatheway & Steane from Olds & Whipple of Hartford were submitted by the purchasers. Guaranties were not given. The samples, **23174** and **23175**, contained 5.77 and 5.96 per cent of nitrogen respectively, equivalent to 7.02 and 7.25 per cent of ammonia. *The price quoted was $45.50 per ton; thus nitrogen cost about 38.7 cents per pound.*

[1] Based on 12 quotations.
[2] Based on 11 quotations.
[3] Based on 15 quotations.
[4] Based on 11 quotations.
[5] Based on 49 quotations.

TABLE IV. ANALYSES OF COTTONSEED MEAL.

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	Ashcraft-Wilkinson Co., Atlanta, Ga.			
23210	Helmet	Station agent from stock of Meech & Stoddard, Middletown	6.43	6.58
23212	Monarch	" "	6.59	6.88
23211	Paramount	" "	5.71	5.76
201	Paramount, 47866 A. C. L.	The Coles Co., Middletown	6.16	5.76
22531	Paramount, 30277 A. C. L.	" "	5.83	5.76
22561	Paramount, 42996 A. C. L.	" "	5.80	5.76
22777	Paramount, 48488 A. C. L.	" "	5.89	5.76
22666		Clark Bros., Windsor	6.11	6.37
22667		Clark Bros., Windsor	5.94	6.37
	S. P. Davis, Little Rock, Ark.			
157	Beauty	Station agent from stock of A. D. Bridge's Sons, Hazardville	5.86	5.75
153	Steerboy	Station agent from stock of Willimantic Grain Co., Willimantic	7.17	6.88
	Humphreys-Godwin Co., Memphis, Tenn.			
139	Bull. 78627 York	The Coles Co., Middletown	6.78	6.88
149	Bull.	Station agent from stock of F. C. Benjamin, Danbury	7.01	6.87
22663	Bull. 75278 N. H.	Spencer Bros., Inc., Suffield	6.96	6.88
22792	Bull 90739 N. H.	Spencer Bros, Inc., Suffield	6.94	6.88
22858	Bull. 31921, Hazardville	L. B. Haas & Co., Inc., Hartford	6.96	6.88
22891	Bull. 23808 M. D.	Hartz Bros., Burnside	6.89	6.88
22910	Bull.	Clark Bros., Windsor	6.88	....
23032	Bull.	Michael Flemming, Suffield	7.70	6.88
23137	Bull. 93083 N. H.	Spencer Bros. Inc., Suffield	7.71	6.88
23138	Bull. 10650 C. N. E.	Spencer Bros. Inc., Suffield	7.35	6.88
23307	Bull. 35465 M. E. C.	Geo. S. Phelps & Co	7.33	6.88
23326	Bull. 88989 N. H.	Spencer Bros., Inc., Suffield	6.74	6.88
23327	Bull. 11244	" "	6.87	6.88
23328	Bull. 62034 B. & M.	" "	6.71	6.88

TABLE IV. ANALYSES OF COTTONSEED MEAL—*Continued.*

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Guaranteed.
	Humphreys-Godwin Co., Memphis, Tenn.			
22997	Bull	H. C. Nelson, West Suffield	6.91	6.88
22422	Danish, 21401 N. S.	The Coles Co., Middletown	5.77	5.76
22662	Danish, 29898 A.C.L.	The Coles Co., Middletown	5.49	5.76
22933	Danish	Geo. S. Phelps & Co., Thompsonville	5.95	5.75
23287	Danish, 46812 A.C.L.	Spencer Bros., Inc., Suffield	5.49	5.75
23288	Danish, 67079	" "	5.93	5.75
23289	Danish, 37905 A.C.L.	" "	5.79	5.75
22251	Dixie, 101407 L.& N.	The Coles Co., Middletown	6.38	6.58
22488	Dixie, 31170	American Sumatra Tobacco Co., Bloomfield	6.55	6.58
22497	Dixie, 15794	American Sumatra Tobacco Co., Bloomfield	6.66	6.58
23166	Dixie, 36514	Hatheway & Steane, Hartford	6.69	....
23199	Dixie, 16447	Apothecaries Hall Co., Waterbury	6.15	6.58
23222	Dixie, 81874 N. H.	G. Stephen Potwine, Warehouse Point	6.44	6.58
23276	Dixie, 43621	L. Wetstone & Sons, Inc., Hartford	6.65	6.58
23277	Dixie, 14954	" "	6.63	6.58
23278	Dixie, 91801	" "	6.63	6.58
23279	Dixie, 74337	" "	6.47	6.58
23281	Dixie, 35573	" "	6.65	6.58
23282	Dixie, 36260	" "	6.49	6.58
23164	Dixie, 63253	Hatheway & Steane, Hartford	6.47	....
23165	Dixie, 31048	" "	7.00	....
23167	Dixie, 39544	" "	6.52	....
23168	Dixie, 244814	" "	7.00	....
23169	Dixie, 10447	" "	6.64	....
23170	Dixie, 27292	" "	7.00	....
23171	Dixie, 37185	" "	6.63	....
23172	Dixie, 60718	" "	7.30	....
23173	Dixie, 28511	" "	6.28	....
22911	90083	Clark Bros., Windsor	6.81	....
22299	33861	American Sumatra Tobacco Co., Bloomfield	6.58	6.58
22300	63743	" "	7.34	6.58
22301	31497	" "	7.40	6.58
22302	89420	" "	7.44	6.58
22303	78742	" "	7.42	6.58
22304	93186	" "	7.14	6.58
22305	72820	" "	7.26	6.58
22351	92340	" "	7.36	6.58

TABLE IV. ANALYSES OF COTTONSEED MEAL—*Continued.*

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	Humphreys-Godwin Co., Memphis, Tenn.			
22352	91544	American Sumatra Tobacco Co., Bloomfield	7.38	6.58
22353	20125	" "	7.20	6.58
22363	91906	" "	6.88	6.58
22364	72954	" "	6.70	6.58
22365	90294	" "	7.00	6.58
22366	564320	" "	6.88	6.58
22367	160758	" "	6.76	6.58
22368	76269	" "	6.89	6.58
22370	16028	" "	7.06	6.58
22377	83038	" "	6.59	6.58
22378	87967	" "	6.46	6.58
22379	93694	" "	6.78	6.58
22380	87799	" "	6.47	6.58
22381	76490	" "	7.00	6.58
22382	73020	" "	6.67	6.58
22383	76100	" "	7.18	6.58
22384	88627	" "	6.97	6.58
22385	84866	" "	6.50	6.58
22407	215399	" "	7.04	6.58
22408	31399	" "	6.63	6.58
22409	83078	" "	6.52	6.58
22410	89632	" "	7.10	6.58
22411	92897	" "	6.59	6.58
22412	88599	" "	6.45	6.58
22413	91579	" "	6.41	6.58
22414	540783	" "	7.50	6.58
22415	18125	" "	6.60	6.58
22440	90415	" "	6.57	6.58
22451	81438	" "	6.68	6.58
22452	74828	" "	7.28	6.58
22453	29148	" "	6.81	6.58
22454	47369	" "	7.46	6.58
22455	67508	" "	6.74	6.58
22456	85716	" "	6.82	6.58
22457	33372	" "	6.62	6.58
22458	92847	" "	6.67	6.58
22459	21806	" "	6.74	6.58
22460	56458	" "	6.81	6.58
22461	70995	" "	6.62	6.58
22466	202843	" "	6.51	6.58
22468	88107	" "	6.58	6.58
22469	88691	" "	6.40	6.58
22470	78291	" "	7.00	6.58

TABLE IV. ANALYSES OF COTTONSEED MEAL—*Continued.*

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	Humphreys-Godwin Co., Memphis, Tenn.			
22471	40360	American Sumatra Tobacco Co., Bloomfield	6.75	6.58
22473	200726	" "	6.83	6.58
22474	90716	" "	6.80	6.58
22475	8634	" "	6.61	6.58
22481	64018	" "	6.77	6.58
22482	245905	" "	6.60	6.58
22483	230723	" "	6.57	6.58
22484	220223	" "	6.52	6.58
22490	19330	" "	6.82	6.58
22491	261624	" "	6.60	6.58
22492	102218	" "	6.56	6.58
22493	331174	" "	6.66	6.58
22496	171397	" "	6.48	6.58
22499	115440	" "	6.72	6.58
22500	87372	" "	6.58	6.58
22501	32059	" "	6.90	6.58
22502	72782	" "	6.47	6.58
22503	89230	" "	6.45	6.58
22791	60455 B. & M.	Spencer Bros., Inc., Suffield	6.79	6.88
22630	42378	L. B. Haas & Co., Inc., Hartford	5.94	6.37
	L. B. Lovitt & Co., Memphis, Tenn.			
23213	Thirty-six Brand	Station Agent. Stock of W. L. Thorp, North Haven	5.51	5.75
	Memphis Cottonseed Products Co., Memphis, Tenn.			
23208	Durham	Station agent. Stock of R. G. Davis & Sons, New Haven	6.38	5.75
	R. N. Neal & Co., Inc., Memphis, Tenn.			
151	Triangle	Station agent. Stock of Yantic Grain & Products Co., Norwich	5.60	5.75
23218	Triangle	Station agent. Stock of Geo. E. Ackley Co., New Milford	6.32	6.58

TABLE IV. ANALYSES OF COTTONSEED MEAL—*Concluded.*

Station No.	Manufacturer or Jobber, Car No. or Mark.	Purchased, Sampled or Sent by	Per cent Nitrogen. Found.	Per cent Nitrogen. Guaranteed.
	Olds & Whipple, Hartford, Conn.			
22631	36824	L. B. Haas & Co., Inc., Hartford	5.99	6.37
22804	61141, B. & M.	Huntington Bros., Windsor	7.05	....
22806	22019	" "	7.07	....
22807	80886	" "	6.53	....
22805	39250	" "	6.09	....
	The Rogers & Hubbard Co., Middletown, Conn.			
148		Station agent from factory	5.82	5.75

II. RAW MATERIALS CHIEFLY VALUABLE FOR PHOSPHORIC ACID.

RAW ROCK PHOSPHATE.

Only one sample was analyzed.

10. Phos-Pho-Flour. Sold by W. L. Mitchell, New Haven, and sampled by the Station agent from stock of H. O. Daniels, Middletown.

It was guaranteed to contain 28 per cent of total phosphoric acid and 30.95 per cent was found.

PRECIPITATED BONE PHOSPHATE.

The bone phosphate of commerce is obtained as a by-product in the manufacture of gelatin and consists largely of dicalcium phosphate. The phosphoric acid in this material is practically all "available."

Four samples were analyzed, all of which exceeded their guaranties. *At the price quoted, available phosphoric acid has cost 6.3 cents per pound. The ton price was $50.00.*

Analyses are given in Table VI.

DISSOLVED ROCK PHOSPHATE OR ACID PHOSPHATE.

This material is the product made by treating raw rock phosphate with sulphuric acid whereby the phosphorus is largely converted into "available" forms. In acid phosphates most of the available phosphoric acid is soluble in water.

The prevailing guaranty is 16 per cent of "available" phosphoric acid, and this amount was exceeded in all of the twenty samples examined.

As regards "available" phosphoric acid this material has varied in composition within the limits of about 50 pounds per ton. The price, however, has ranged from $14.00 to $30,00 and the cost per pound of available phosphoric acid has accordingly varied from 4.2 to 9.2 cents. *On the average, acid phosphate this year has contained 16.73 per cent of available phosphoric acid, which at the average price ($21.11) per ton has made the cost of this constituent 6.3 cents per pound, or $1.26 per unit.*

Analyses are given in Table VII.

TABLE VI. ANALYSES OF PRECIPITATED BONE PHOSPHATE.

Station No.	Manufacturer or Wholesale Dealer.	Place of Sampling.	Phosphoric Acid.			
			Citrate-insoluble.	Total.	"Available" Found.	"Available" Guaranteed.
	Sampled by Station:		%	%	%	%
23016	Apothecaries Hall Co., Waterbury	At Factory, East Windsor.	0.91	41.20	40.29	36.00
22918	Berkshire Fertilizer Co., Bridgeport	At Factory	0.37	41.04	40.67	38.00
22928	Olds & Whipple, Inc., Hartford	At Factory	0.50	40.42	39.92	38.00
	Sampled by Purchaser:					
22463	Olds & Whipple, Inc., Hartford	American Sumatra Tobacco, Co., Bloomfield	0.25	38.44	38.19	.....

TABLE VII. ANALYSES OF ACID PHOSPHATE.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Phosphoric Acid.				Station No.
			Citrate-insoluble.	Total.	"Available" Found.	"Available" Guaranteed.	
	Sampled by Station:		%	%	%	%	
23064	American Agricultural Chemical Co., New York	C. F. Allen, Warehouse Point	0.15	16.83	16.68	16.00	23064
23184	Apothecaries Hall Co., Waterbury	Sampled at Factory	1.38	17.68	16.30	16.00	23184
23007	Armour Fertilizer Works, New York.	Robert Greenbacker, Meriden	0.53	16.69	16.06	16.00	23007
22870	Berkshire Fertilizer Co., Bridgeport.	T. W. Ryan, Stratford	0.20	17.49	17.29	16.00	22870
23228	Bowker Fertilizer Co., New York.	Geo. E. Ackley Co., New Milford	0.15	16.40	16.25	16.00	23228
23271	E. D. Chittenden Co., Bridgeport.	J. E. Stoddard, Abington	0.53	16.73	16.20	16.00	23271
23133	Coe-Mortimer Co., New York	J. B. McArdle, Greenwich	0.15	16.48	16.33	16.00	23133
23239	Consolidated Rendering Co., Boston.	L. T. Frisbie, New Haven	0.15	17.58	17.43	16.00	23239
22902	Eastern States Farmers' Exchange, Springfield	H. H. McKnight, Ellington	0.49	16.52	16.03	16.00	22902
99	International Agricultural Corporation, Boston	Alva Taylor, West Suffield	0.78	17.80	17.02	16.00	99
23131	Nitrate Agencies Co., Bound Brook, N. J.	Joseph Adams, Westport	0.28	16.43	16.15	16.00	23131
22936	Olds & Whipple, Inc., Hartford	Sampled at Factory	0.72	17.63	16.91	16.00	22936
22956	The Rogers & Hubbard Co., Portland	Sampled at Factory	0.12	18.66	18.54	16.00	22956
23019	The Rogers & Hubbard Co., Portland	The Lyman Farm, Middlefield	0.41	17.21	16.80	16.00	23019
23068	F. S. Royster Guano Co., Baltimore.	W. S. Brown, Trumbull	1.63	17.76	16.13	16.00	23068
22985	Sanderson Fertilizer & Chemical Co., New Haven	Sampled at Factory	0.08	16.73	16.65	16.00	22985
23194	Virginia-Carolina Chemical Co., New York	E. O. Chapman, North Haven	1.28	18.23	16.95	16.00	23194
23196	Wilcox Fertilizer Co., Mystic	W. E. Thompson, Ellington	0.20	18.05	17.85	17.00	23196
	Sampled by Purchaser:						
22230	E. D. Chittenden Co., Bridgeport.	A. B. Lapsly, Pomfret Center	0.74	17.46	16.72	16.00	22230
23139	The L. T. Frisbie Co., New Haven.	W. T. Clark, Norwich	1.68	17.88	16.20	16.00	23139

III. RAW MATERIALS CONTAINING POTASH.

CARBONATE OF POTASH.

Pure carbonate of potash contains 68.2 per cent of actual potash (K_2O), but commercial grades usually contain from 60 to 65 per cent. Most of the samples submitted were guaranteed to contain 96 per cent carbonate of potash which is equivalent to 65.44 per cent actual potash.

Thirteen samples were analyzed, all but one being submitted by purchasers. Two samples, Nos. **22494** and **22495,** failed to meet their guaranties by 3.01 and 2.18 per cent respectively; these samples were from the same stock as two previous samples viz., **22358** and **22356,** both of which more nearly approached the guaranty.

Analyses are given in Table VIII.

MURIATE OF POTASH.

The usual commercial grade of this salt is about 80 per cent pure containing about 50.5 per cent actual potash. Because it readily absorbs moisture, guaranties are often placed somewhat lower, viz., 48 to 50 per cent. The prevailing guaranty for samples examined this year was 50 per cent.

Thirteen samples were analyzed, four of which contained considerably less than 48 per cent. Sample **22871** was from three bags which represented the remainder of a four-ton lot. The analysis may not, therefore, be representative of the whole shipment.

Nos. **23140** and **23324** were purchaser's samples from the same lot. The goods were sold by the L. T. Frisbie Company and obtained by them from the Consolidated Rendering Company of Boston. These two samples were considerably below the guaranty of 50 per cent; an official sample, **23242,** taken by the Station agent at the plant of the Frisbie Company exceeded the guaranty by nearly 1.5 per cent.

The average for all samples is close to 50 per cent (49.92), of potash which, at the average of prices quoted, $44.40, makes the cost of potash in this material 4.5 cents per pound or 90 cents per unit. The lowest cost noted is 3.8 cents, and the highest is 5 cents per pound.

Analyses are given in Table VIII.

HIGH GRADE SULPHATE OF POTASH.

The commercial grades of this salt generally contain about 48.0 per cent of potash which is approximately 90 per cent sulphate of potash.

Twenty-six samples were examined of which ten were drawn by the Station agent and the remainder by purchasers. The

official samples substantially met or exceeded their guaranties. Several samples, submitted by purchasers, while of fair average quality did not meet the guaranties quoted for them which were over 50 per cent. Two, **22350** and **22535,** were considerably under 48 per cent.

The average potash content was 49.1 per cent and the cost per pound, based upon the few prices quoted, averaged 5.5 cents.

Seven samples, representing early season purchases of the American Sumatra Tobacco Co., were submitted by the purchasers. The samples purported to be high grade sulphate but, on analysis, only one conformed to that grade, the others containing from 30 to 40 per cent of potash with considerable and varying amounts of chlorine and magnesia. Investigation by the Station agent showed that this shipment was received in the original import sacks distinguished only by serial numbers; and that there were two grades in the lot, one in bags marked 419 and the other in bags marked 482 and 600. The low grade stock was included in the shipment by mistake and replacement was made.

Analyses are given in Table VIII.

TABLE VIII. ANALYSES OF POTASH SALTS.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash. Found.	Potash. Guaranteed.	Station No.
	Carbonate of Potash.		%	%	
	Sampled by Station:				
23234	Apothecaries Hall Co., Waterbury.....	Sampled at Factory.....	65.86	62.00	23234
	Sampled by Purchaser:				
22417	.....	American Sumatra Tobacco Co., Bloomfield	66.56	.....	22417
22418	.....	" "	61.44	.....	22418
22214	A. Klipstein, New York City.....	" "	66.28	65.44	22214
22215	" "	" "	66.68	65.44	22215
22248	" "	" "	65.72	65.44	22248
22249	" "	" "	66.32	65.44	22249
22306	" "	" "	64.96	65.44	22306
22356	" "	" "	65.16	65.44	22356
22357	" "	" "	65.52	65.44	22357
22358	" "	" "	64.88	65.44	22358
22494	" "	" "	62.43	65.44	22494
22495	" "	" "	63.26	65.44	22495
	Muriate of Potash.				
	Sampled by Station:				
22923	Apothecaries Hall Co., Waterbury.....	J. A. Glasnapp, West Cheshire.....	55.90	50.00	22923
23012	Armour Fertilizer Works, New York.....	F. A. Bartlett, Stamford.....	52.08	48.00	23012

TABLE VIII. ANALYSES OF POTASH SALTS—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash. Found.	Potash. Guaranteed.	Station No.
	Muriate of Potash—*Continued.*		%	%	
	Sampled by Station:				
22871	Berkshire Fertilizer Co., Bridgeport	T. W. Ryan, Stratford	49.12	50.00	22871
23242	Consolidated Rendering Co., Boston, Mass.	The L. T. Frisbie Co., New Haven	51.45	50.00	23242
164	Eastern States Farmers' Exchange, Springfield, Mass.	H. H. McKnight, Ellington	49.47	50.00	164
305	" "	" "	44.89	50.00	305
22905	" "	" "	46.83	50.00	22905
190	Nitrate Agencies Co., Bound Brook, N. J.	E. N. Austin, Suffield	49.62	50.00	190
23151	Nitrate Agencies Co., Bound Brook, N. J.	H. P. Beers, Greens Farms	51.25	50.00	23151
23297	Wilcox Fertilizer Co., Mystic	Sampled at Factory	55.59	50.00	23297
	Sampled by Purchaser:				
23365	American Agricultural Chemical Co., New York	R. E. Upson, Marion	50.62	48.00	23365
23140	The L. T. Frisbie Co., New Haven	W. T. Clark, Norwich	46.86	50.00	23140
23324	The L. T. Frisbie Co., New Haven	W. T. Clark, Norwich	45.26	50.00	23324
	Sulphate of Potash.				
	Sampled by Station:				
22263	S. P. 419	American Sumatra Tobacco Co., Bloomfield	50.36	.....	22263
22925	American Agricultural Chemical Co., New York	Geo. S. Phelps & Co., Thompsonville	49.47	48.00	22925

TABLE VIII. ANALYSES OF POTASH SALTS—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash. Found.	Potash. Guaranteed.	Station No.
	Sulphate of Potash—*Continued.*		%	%	
	Sampled by Station:				
6	Apothecaries Hall Co., Waterbury	Sampled at Factory	47.44	48.00	6
23018	Apothecaries Hall Co., Waterbury	" "	47.76	48.00	23018
22919	Berkshire Fertilizer Co., Bridgeport	" "	50.15	48.00	22919
23241	Consolidated Rendering Co., Boston, Mass.	The L. T. Frisbie Co., New Haven	49.47	48.00	23241
189	Nitrate Agencies Co., Bound Brook, N. J.	E. N. Austin, Suffield	50.20	48.00	189
23158	Nitrate Agencies Co., Bound Brook, N. J.	H. P. Beers, Greens Farms	49.50	48.00	23158
22938	Olds & Whipple, Inc., Hartford	Sampled at Factory	50.24	48.65	22938
23431	The Rogers & Hubbard Co., Portland	Sampled at Factory	49.61	48.00	23431
	Sampled by Purchaser:				
22420	..... S. P. 500	American Sumatra Tobacco Co., Bloomfield	50.88	.....	22420
22563	30567 S. P. 484	" "	49.69	51.29	22563
22564	26174 S. P. 338	" "	48.77	50.64 [1]	22564
22565	30567 S. P. 218	" "	51.00	52.48 [2]	22565
22566	30567 S. P. 354	" "	48.60	.....	22566
22567	36081 S. P. 498	" "	48.20	.....	22567
22568	36081 S. P. 494	" "	49.56	.....	22568

[1] Guaranteed 93.6 per cent sulphate of potash.
[2] Guaranteed 97.01 per cent sulphate of potash.

TABLE VIII. ANALYSES OF POTASH SALTS—*Concluded.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash. Found.	Potash. Guaranteed.	Station No.
	Sulphate of Potash—*Concluded.* *Sampled by Purchaser:*		%	%	
22583	8812 S. P. 218	American Sumatra Tobacco Co., Bloomfield	51.36	52.48[3]	**22583**
22584	8812 S. P. 338	" "	47.68	50.64[4]	**22584**
22585	8812 S. P. 484	" "	50.32	51.29[5]	**22585**
22586	8812 S. P. 354	" "	49.24	.....	**22586**
22587	8812 S. P. 492	" "	49.16	.....	**22587**
22588	8812 S. P. 498	" "	48.44	.....	**22588**
22589	8812 S. P. 355	" "	49.76	.....	**22589**
22350	Olds & Whipple, Inc., Hartford	Huntington Bros., Windsor	46.44	48.65	**22350**
22535	Olds & Whipple, Inc., Hartford	Clark Bros., Windsor	43.32	48.65	**22535**

[3] Guaranteed 97.01 per cent sulphate of potash.
[4] Guaranteed 93.6 per cent sulphate of potash.
[5] Guaranteed 94.8 per cent sulphate of potash.

DOUBLE SULPHATE OF POTASH AND MAGNESIA OR "DOUBLE MANURE SALTS".

Six samples were analyzed this year and the results are given in Table IX.

This salt contains potash and magnesia combined as sulphate and is relatively free from chlorine, which makes it well adapted for use in tobacco fertilizers. It generally contains from 25 to 28 per cent of potash and from 8 to 12 per cent of magnesia. In the last three years, however, seven out of twenty-one samples examined by us have shown amounts of magnesia less than 8 per cent, these ranging from 6.6 down to as low as 3 per cent. In only four of the total number has chlorine exceeded 4 per cent and in none has it reached 5 per cent.

The average potash content in samples analyzed this year is 27.67 per cent and the average cost per pound of potash, at the prices quoted, is 5.1 cents.

TABLE IX. ANALYSES OF DOUBLE MANURE SALTS.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash.		Magnesia.	Chlorine.	Station No.
			Found.	Guaranteed.			
	Sampled by Station:		%	%	%	%	
22931	American Agricultural Co., New York..	Spencer Bros., Suffield.....	27.97	26.00	11.51	1.81	22931
23215	Apothecaries Hall Co., Waterbury.....	Station agent at factory.....	28.98	26.00	2.97	1.05	23215
22920	Berkshire Fertilizer Co., Bridgeport....	" "	26.18	26.00	6.62	2.48	22920
22935	Olds & Whipple, Inc., Hartford.....	" "	27.60	26.00	11.46	1.97	22935
	Sampled by Purchaser:						
22682	Olds & Whipple, Inc., Hartford.....	L. B. Haas & Co., Hartford..	26.52	.....	4.34	0.47	22682
22949	Olds & Whipple, Inc., Hartford.....	L. B. Haas & Co., Hartford..	28.75	26.00	.....	.....	22949

IV. RAW MATERIALS CONTAINING NITROGEN AND POTASH.

One sample of nitrate of potash and three of nitrate of soda and potash have been analyzed, all sampled by the Station agent.

23020. Nitrate of potash from Calcutta, India. Stock of the Lyman Farm, Middlefield.

22924 Nitrate of Soda and Potash. Sold by Apothecaries Hall, sampled from stock of J. A. Glasnapp, West Cheshire.

23416. Nitrapo. Sold by Nitrate Agencies Co., sampled from stock of F. H. Thrall, Windsor.

191. Nitrapo. Sold by Nitrate Agencies Co., sampled from stock of E. N. Austin, Suffield.

Analyses are given in Table X.

TABLE X. ANALYSES OF NITRATE OF POTASH, ETC.

Station No.	23020	22924	23416	191
Nitrogen:				
found	12.60	15.46	14.30	11.78
guaranteed	.....	14.80	14.80	14.80
Equivalent ammonia:				
found	15.32	18.80	17.39	14.32
guaranteed	.....	18.00	18.00	18.00
Potash:				
found	43.45	14.11	17.15	12.41
guaranteed	.....	12.00	15.00	15.00

The price quoted in case of sample **22924** was $75.00 per ton. *Allowing 5 cents per pound for potash the cost of nitrogen was 19.6 cents, which is a little less than the minimum cost calculated for nitrate of soda this year.*

V. RAW MATERIALS CONTAINING NITROGEN AND PHOSPHORIC ACID.

DRY GROUND FISH.

Forty samples were analyzed and the results are given in Table XI.

The prevailing guaranty for nitrogen was 8.23 per cent, equivalent to 10 per cent of ammonia. The guaranties for phosphoric acid varied from 4 to 9 per cent.

The average nitrogen content found was 8.45 per cent, equivalent to 10.27 per cent of ammonia, and the average for phosphoric acid was 7.37 per cent.

Based upon the average cost per ton as quoted, and allowing 5 cents per pound for phosphoric acid, nitrogen in this material has cost about 37.9 cents per pound. There were considerable overruns in phosphoric acid in most cases, assuming an average where no guaranty was given. Taking these into account, there were no deficiencies in nitrogen which exceeded $1.00 per ton except in **23418** where the estimated shortage was $1.14.

TANKAGE.

Tankage is prepared from animal refuse secured from slaughter houses and meat markets and may contain considerable and varying amounts of bone. The distinction between meat tankage and bone tankage is not sharply drawn but, in general, tankage with 5 per cent or less of nitrogen and 15 per cent or more of phosphoric acid shows considerable bone and is often sold as bone and meat tankage. As the nitrogen content increases, phosphoric acid becomes less, and in tankage containing over 5 per cent of nitrogen there is generally less than 15 per cent of phosphoric acid, indicating a preponderance of meat. According to definitions established for tankage to be used for feeding purposes, phosphoric acid in excess of 10 per cent is regarded as bone and meat tankage.

Fineness is an important factor in determining the utilization of tankage by crops, particularly in those products containing the higher amounts of bone.

Eighteen samples have been analyzed and analyses are given in Table XII.

Sample **171** was drawn to check the results obtained on **23142.** Sample **23021** was sold direct to the user and was reinforced with bone phosphate at the direction of the purchaser.

On the basis of the classification suggested above there are six samples in which the nitrogen is less than 5 per cent and the phosphoric acid more than 15 per cent; in the remaining twelve the reverse is true, i. e., nitrogen is more than 5 per cent and phosphoric acid is less than 15 per cent. In the first group the average nitrogen is 4.14 per cent and the average phosphoric acid is 19.86 per cent, which approaches the composition of bone. The average of quoted prices is $34.79.

In the second group the averages for nitrogen and phosphoric acid are 6.62 and 10.35 per cent respectively, and the average price quoted is $46.99.

GROUND BONE.

Twenty-six samples were analyzed and results are given in Table XIII.

The guaranties for nitrogen and phosphoric acid were met in almost all cases, generally with a considerable overage. Two samples which were deficient in phosphoric acid, **23129** and **43,** contained excesses of nitrogen which more than balanced the deficiencies.

In fifteen samples 50 per cent or more of the material was finer than 1/50th of an inch, and in five, 60 per cent or more was of that degree of fineness.

Prices quoted ranged from $36.50 to $66.00, the average being $49.72. The averages for nitrogen and phosphoric acid were 3.42 and 24.16 per cent respectively. *Allowing 27 cents per pound for nitrogen, phosphoric acid from this source has cost 6.5 cents per pound.*

TABLE XI. ANALYSES OF

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.
	Sampled by Station:	
23062	American Agricultural Chemical Co., New York	Geo. S. Phelps & Co., Thompsonville
23259	American Agricultural Chemical Co., New York	J. P. Norton, Broad Brook
23017	Apothecaries Hall Co., Waterbury	Sampled at factory, East Windsor
22921	Berkshire Fertilizer Co., Bridgeport	Sampled at factory
22961	Berkshire Fertilizer Co., Bridgeport	J. E. Lathrop, Burnside
23294	E. D. Chittenden Co., Bridgeport	E. J. Bantle, Glastonbury
155	Eastern States Farmers' Exchange, Springfield	H. H. McKnight, Ellington
22963	L. T. Frisbie Co., New Haven	T. J. Coleman, Warehouse Point
23262	L. T. Frisbie Co., New Haven	Sampled at factory
138	International Agricultural Corp., Boston	Chas. Maag, Manchester
23418	Nitrate Agencies Co., New York	E. N. Austin, Suffield
40	Olds & Whipple, Inc., Hartford	Sampled at factory
23426	The Rogers & Hubbard Co., Portland	" "
22987	Sanderson Fertilizer & Chemical Co., New Haven	" "
23187	Wilcox Fertilizer Co., Mystic	F. S. Bidwell & Co., Windsor Locks
	Sampled by Purchaser:	
21890	Berkshire Fertilizer Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield
21891	" "	" "
21892	" "	" "
21893	" "	" "
21896	" "	" "
21897	" "	" "
21898	" "	" "
21923	" "	Hatheway & Steane, Hartford
21924	" "	Hatheway & Steane, Hartford
21987	" "	American Sumatra Tobacco Co., Bloomfield
21988	" "	" "
21989	" "	" "
21990	" "	" "
21991	" "	" "
22198	" "	Hatheway & Steane, Hartford

Dry Ground Fish.

Nitrogen.				Ammonia equivalent to total nitrogen.	Phosphoric Acid.		
As ammonia.	As organic.	Total found.	Total guaranteed.		Total found.	Total guaranteed.	Station No.
%	%	%	%	%	%	%	
1.29	6.51	7.80	8.23	9.48	9.73	6.00	23062
0.27	8.01	8.28	8.23	10.07	9.20	6.00	23259
1.03	8.02	9.05	8.20	11.00	7.06	5.50	23017
....	.....	8.21	8.22	9.98	7.88	6.00	22921
0.19	7.98	8.17	8.22	9.93	7.93	6.00	22961
0.23	9.05	9.28	8.22	11.28	7.70	4.00	23294
0.83	7.43	8.26	8.23	10.04	5.70	.....	155
0.32	7.68	8.00	8.22	9.73	8.79	6.40	22963
0.39	7.89	8.28	8.22	10.07	7.93	6.40	23262
0.19	6.49	6.68	6.58	8.12	7.03	7.00	138
0.59	8.25	8.84	9.04	10.75	5.25	5.03	23418
0.07	9.35	9.42	8.23	11.45	7.80	5.00	40
0.05	9.68	9.73	9.50	11.83	6.95	.....	23426
0.23	8.30	8.53	8.23	10.37	9.42	6.00	22987
0.88	7.99	8.87	9.04	10.78	7.30	6.00	23187
0.15	7.92	8.07	8.23	9.81	7.50	.....	21890
0.07	8.31	8.38	8.23	10.19	7.46	.....	21891
0.07	8.47	8.54	8.23	10.38	7.54	.....	21892
0.13	8.21	8.34	8.23	10.14	7.61	.....	21893
0.14	8.16	8.30	8.23	10.09	7.69	....	21896
0.08	8.34	8.42	8.23	10.24	7.37	....	21897
0.11	8.29	8.40	8.23	10.21	7.46	....	21898
0.11	8.82	8.93	8.23	10.86	7.80	6.00	21923
0.12	8.61	8.73	8.23	10.61	7.77	6.00	21924
....	....	8.31	8.23	10.10	....	....	21987
0.15	8.61	8.76	8.23	10.65	7.22	....	21988
0.11	8.73	8.84	8.23	10.75	6.83	....	21989
0.12	8.37	8.49	8.23	10.32	7.02	....	21990
0.12	8.14	8.26	8.23	10.04	7.60	....	21991
0.13	8.48	8.61	8.23	10.47	7.83	....	22198

TABLE XI. ANALYSES OF

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.
	Sampled by Purchaser:	
22212	Berkshire Fertilizer Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield
22213	" "	" "
22386	" "	" "
22387	" "	" "
22388	" "	" "
22389	" "	" "
22390	" "	" "
22441	" "	" "
22462	" "	" "
22722	New England Fertilizer Co., Boston	W. E. Fiske, Warehouse Point

DRY GROUND FISH—*Concluded.*

Nitrogen.				Ammonia equivalent to total nitrogen.	Phosphoric Acid.		
As ammonia.	As organic.	Total found.	Total guaranteed.		Total found.	Total guaranteed.	Station No.
%	%	%	%	%	%	%	
0.10	8.62	8.72	8.23	10.60	7.51	....	**22212**
0.13	8.52	8.65	8.23	10.52	6.84	....	**22213**
0.14	8.13	8.27	8.23	10.05	6.74	....	**22386**
0.08	7.97	8.05	8.23	9.79	6.79	....	**22387**
0.13	8.11	8.24	8.23	10.02	6.77	....	**22388**
0.12	7.93	8.05	8.23	9.79	6.49	....	**22389**
0.14	8.05	8.19	8.23	9.96	6.56	....	**22390**
0.20	8.36	8.56	8.23	10.41	7.89	....	**22441**
0.16	8.69	8.85	8.23	10.76	7.25	....	**22462**
0.08	7.63	7.71	....	9.37	4.29	....	**22722**

TABLE XII. ANALYSES OF TANKAGE.

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen.				Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
			As ammonia.	As organic.	Total found.	Total guaranteed.		Found.	Guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
	Sampled by Station:		%	%	%	%	%	%	%	%	%	
23009	Apothecaries Hall Co., Waterbury	Knowles-Lombard, Guilford	0.25	8.14	8.39	7.40	10.20	9.04	9.00	47.0	53.0	23009
23015	" "	Station agent at factory, East Windsor	0.34	8.21	8.55	7.81	10.40	4.21	3.00	55.5	44.5	23015
23185	" "	H. F. Joy, Woodstock	0.13	4.66	4.79	5.75	5.82	18.75	5.00	52.0	48.0	23185
22869	Berkshire Fertilizer Co., Bridgeport	T. W. Ryan, Stratford	....	....	7.23	7.40	8.79	10.84	6.86	52.0	48.0	22869
22897	The Connecticut Fat Rendering and Fertilizing Corp., New Haven	Station agent at factory	....	....	3.83	3.29	4.66	19.85	22.28	43.0	57.0	22897
171	The Consolidated Rendering Co., Boston, Mass	M. E. Cook, Wallingford	0.22	4.92	5.14	4.92	6.25	13.93	14.00	23.0	77.0	171
23236	" "	L. T. Frisbie Co., New Haven	0.19	6.93	7.12	7.41	8.66	10.08	9.15	27.0	73.0	23236
23238	" "	L. T. Frisbie Co., New Haven	0.25	5.16	5.41	4.92	6.58	12.61	14.00	26.0	74.0	23238
341	" "	Chas. E. Lyman Est., Middlefield	0.22	....	4.82	....	5.86	16.25	.....	24.0	76.0	341
22906	Eastern States Farmers' Exchange, Springfield	H. H. McKnight, Ellington	....	....	5.28	5.75	6.42	14.89	6.85	36.0	64.0	22906
23021	The Consolidated Rendering Co., Boston, Mass.	The Lyman Farm, Middlefield	0.17	4.46	4.63	....	5.63	15.86	.....	35.5	64.5	23021
23150	Nitrate Agencies Co., Bound Brook, N. J.	H. P. Beers, Greens Farms	0.11	7.04	7.15	5.75	8.69	4.06	6.86	59.0	41.0	23150
23474	Worcester Rendering Co., Auburn, Mass	Dayville Coal & Grain Co., Danielson	0.20	5.93	6.13	5.74	7.45	13.70	10.00	34.0	66.0	23474

TABLE XII. ANALYSES OF TANKAGE—*Concluded.*

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen.				Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
			As ammonia.	As organic.	Total found.	Total guaranteed.		Found.	Guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
	Sampled by Purchaser.		%	%	%	%	%	%	%	%	%	
23325	The Consolidated Rendering Co., Boston, Mass.	Walter T. Clark, Norwich	0.26	5.43	5.69	4.92	6.92	11.68	14.00	26.0	74.0	23325
23142	The L. T. Frisbie Co., New Haven	Walter T. Clark, Norwich	0.27	5.60	5.87	4.92	7.14	11.69	14.00	26.0	74.0	23142
23347	Lederle's Laboratory, Pearl River, N. Y.	O. G. Beard, Shelton	0.45	7.00	7.45	....	9.06	7.48	.....	8.0	92.0	23347
23078	.....	Nathan Lerner, North Westchester	....	....	3.23	....	3.93	23.80	.....	36.0	64.0	23078
23079	.....	Nathan Lerner, North Westchester	....	....	3.51	....	4.27	24.65	.....	53.0	47.0	23079

TABLE XIII. ANALYSES OF

Station No.	Manufacturer.	Dealer or Purchaser.
	Sampled by Station:	
23065	American Agricultural Chemical Co., New York	W. C. Mansfield, North Haven.
23010	Apothecaries Hall Co., Waterbury	Knowles-Lombard Co., Guilford
23224	Armour Fertilizer Works, New York	Collins & Freeman, Branford..
23129	Berkshire Fertilizer Co., Bridgeport	C. Buckingham & Co., Southport
23298	The E. D. Chittenden Co., Bridgeport	J. E. Stoddard, Abington
22932	Consolidated Rendering Co., Boston	Geo. S. Phelps & Co., Thompsonville
23247	Consolidated Rendering Co., Boston	John O. Fox & Co., Putnam
22903	Eastern States Farmers' Exchange, Springfield	H. H. McKnight, Ellington
22917	L. T. Frisbie Co., New Haven..	Lightbourn & Pond Co., New Haven
166	New England By-Products Corp., Lawrence, Mass.	C. A. Cowles, Plantsville
167	New England By-Products Corp., Lawrence, Mass.	F. L. Wadhams & Sons, Torrington
23152	Nitrate Agencies Co., Bound Brook, N. J.	H. P. Beers, Greens Farms
22940	Olds & Whipple Co., Inc., Hartford	Station agent at factory
22930	The Rogers & Hubbard Co., Portland	Cadwell & Jones, Hartford
23432	The Rogers & Hubbard Co., Portland	Station agent at factory
22929	F. S. Royster Guano Co., Baltimore	F. B. Newton Estate, Plainville
23448	Sanderson Fertilizer & Chemical Co., New Haven	F. Hallock & Co., Derby
22937	M. L. Shoemaker & Co., Philadelphia	Olds & Whipple, Inc., Hartford.
23461	M. L. Shoemaker & Co., Philadelphia	Spencer Bros., Suffield
23191	Virginia-Carolina Chemical Co., New York	E. O. Chapman, North Haven..
160	Wilcox Fertilizer Co., Mystic..	M. E. Thompson, Ellington
	Sampled by Purchaser:	
22203	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Hartford.
22204	" "	Hatheway & Steane, Hartford.
22794	" "	E. F. Clark, Woodbury
43	" "	Geo. W. Fraser, Willimantic
23145	L. T. Frisbie & Co., New Haven	Walter T. Clark, Norwich

Ground Bone.

Nitrogen.		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
Found.	Guaranteed.		Found.	Guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
%	%	%	%	%	%	%	
2.91	2.47	3.54	25.05	22.88	32.0	68.0	**23065**
4.01	3.29	4.88	22.34	20.00	53.5	46.5	**23010**
2.65	2.47	3.22	23.85	22.00	50.0	50.0	**23224**
3.47	1.64	4.22	20.36	25.00	42.0	58.0	**23129**
2.69	2.47	3.27	24.55	22.00	51.0	49.0	**23298**
2.05	2.05	2.49	28.91	26.00	51.0	49.0	**22932**
3.19	2.46	3.88	24.15	24.00	38.0	62.0	**23247**
2.66	2.46	3.23	25.25	23.00	45.0	55.0	**22903**
3.61	2.46	4.39	23.53	20.00	48.0	52.0	**22917**
3.94	3.75	4.79	26.10	25.00	79.5	20.5	**166**
2.02	2.00	2.46	28.40	25.17	54.0	46.0	**167**
2.93	2.46	3.56	24.45	22.88	63.0	37.0	**23152**
2.47	2.50	3.00	26.30	22.00	54.0	46.0	**22940**
3.84	3.82	4.67	26.10	24.70	64.0	36.0	**22930**
4.13	3.29	5.02	22.53	20.50	70.0	30.0	**23432**
2.47	2.47	3.00	27.76	22.90	56.0	44.0	**22929**
2.49	2.47	3.03	26.20	22.88	38.0	62.0	**23448**
4.64	4.51	5.64	23.31	20.00	34.0	66.0	**22937**
5.45	3.69	6.63	21.00	21.00	25.0	75.0	**23461**
4.56	3.70	5.54	20.98	20.60	50.0	50.0	**23191**
2.50	2.46	3.04	22.95	22.80	77.5	22.5	**160**
			.....	.....			
3.55	....	4.32	24.76	.....	58.0	42.0	**22203**
3.65	....	4.44	24.66	.....	55.0	45.0	**22204**
4.99	....	6.07	22.29	.....	....	....	**22794**
4.65	2.46	5.65	17.62	22.00	44.0	56.0	**43**
3.29	2.46	4.00	24.85	20.00	38.0	62.0	**23145**

VI. MIXED FERTILIZERS.

MIXTURES CONTAINING PHOSPHORIC ACID AND POTASH.

Two samples in which only phosphoric acid and potash were guaranteed were analyzed.

96. Buffalo Phosphate and Potash. International Agricultural Corporation, Boston.

19. Olds and Whipple Bone Phosphate and Potash Compound. Olds and Whipple, Inc., Hartford.

Both samples were drawn by the Station agent. Analyses are as follows:

Station No.		**96**	**19**
		%	%
Phosphoric acid:			
available,	found	12.01	5.22
	guaranteed	12.00	4.00
total,	found	12.64	5.30
	guaranteed	13.00	4.00
Potash:			
	found	6.16	16.26
	guaranteed	6.00	15.00

MIXTURES CONTAINING NITROGEN AND PHOSPHORIC ACID.

Three samples which contain no potash have been analyzed.

36. Olds and Whipple Top Dressing for Grass, 7-4-0. Sampled by Station agent from stock of F. T. Blish Hardware Co., South Manchester.

23198. Olds and Whipple High Grade Tobacco Starter. Olds and Whipple, Inc., Hartford. Sampled by Station agent from stock of E. O. Gates, Pine Meadow.

23061. Shoemaker's Swift-Sure Tobacco Starter, 4-10-0. Sampled by Station agent from stock of F. S. Bidwell & Co., Windsor Locks.

Analyses are as follows:

Station No.	**36**	**23198**	**23061**
	%	%	%
Nitrogen:			
found	5.81	11.15	3.63
guaranteed	5.76	8.23	3.28
Ammonia equivalent to nitrogen found	7.06	13.56	4.41
Phosphoric acid:			
total	7.40	4.30	14.50
available, found	5.15	3.87	10.50
guaranteed	4.00	3.00	10.00

In both these samples the active insoluble organic nitrogen was of good quality as judged by the usual methods.

MIXTURES CONTAINING AMMONIA, PHOSPHORIC ACID AND POTASH.

In Table XIV are given analyses of two hundred and ninety-nine samples of complete fertilizers. Two hundred and eighty-two were drawn officially by the Station agent and seventeen were submitted by purchasers.

In the column headed "grade" appear the figures which represent the guaranteed amounts of ammonia, available phosphoric acid and potash in the order named; thus, 4-8-4 means that the brand is guaranteed to contain 4 per cent of ammonia, 8 per cent of available phosphoric acid and 4 per cent of potash. In the analyses on the right hand pages of the table the corresponding percentages of these constituents as found appear in bold face type.

Concerning Guaranties.

Of the two hundred and eighty-two official samples, one hundred and twenty, or about 40 per cent, failed to completely satisfy their guaranties, deficiencies of 0.12 per cent in ammonia, 0.2 per cent in available phosphoric acid and 0.15 per cent in potash being disregarded. Each sample requires three major determinations in order to check the guaranty, hence eight hundred and forty-six determinations have been required for the official samples in this group. Since some samples have been deficient in more than one item, the total number of deficiencies found was one hundred and forty-nine; in other words, about 82.4 per cent of the individual items of plant food guaranteed have been substantially correct or in excess of guaranties.

Taking the total number of samples of each manufacturer who registered three or more brands, and calculating from the analyses the average shortage or overrun in elements of plant food guaranteed, we deduce the following summary:

Of 26 manufacturers,—

16 equaled or exceeded guaranties in the three elements.
9 equaled or exceeded guaranties in two elements and were short in one.
1 equaled or exceeded the guaranty in one element and was short in two.

Nine of the shortages were in ammonia and there was one each in available phosphoric acid and potash. The ammonia deficiencies ranged from 0.10 to 0.53 per cent; seven were less than 0.25 per cent. The deficiencies in available phosphoric acid and potash were 0.15 and 0.19 per cent respectively.

ANALYSES REQUIRING SPECIAL COMMENT.

Special comment or explanation is due in connection with the following analyses:

185. Aben Hardware Co. This sample represents a part of a cargo of fertilizer salvaged from a wrecked vessel. The goods were found to be under guaranty but they were sold for a price at which the purchaser suffered no loss.

158. Am. Agr. Chem. Co., 3-8-4. The manufacturer obtained 3.74 per cent of potash on a duplicate portion of our sample. Our report for potash was 3.71 per cent. On **159,** 5-8-7 of the same manufacturer, their result for potash was 6.71 per cent; our report was 6.50 per cent.

Five of the Armour brands have shown considerable deficiencies. Second samples were analyzed in nearly all cases.

23398. Atlantic Tobacco Manure 5-8-6. This was found below guaranty in ammonia; a second sample, **172,** from another source, was also low. The results for the two samples were 4.44 and 4.77 respectively.

23125. Berkshire Complete Tobacco 5-3-5. This showed 4.83 per cent ammonia but a second sample, **5,** from another source showed 5.22 per cent. The average analysis for the two samples is 5.03-3.89-5.78, which meets the guaranty.

23301. This sample was drawn as Chittenden's Top Dresser 6-8-4, but analysis showed it to be a 4-8-4 brand. Investigation was made but it could not be determined beyond doubt whether Potato Manure was packed in bags marked "Top Dresser" or whether an error in sampling had occurred. A second sample could not be obtained from this or any other purchaser and the sample is, therefore, accepted as a 4-8-4 brand.

23392. Clark's Special Mixture, 4-8-4, was reported low in ammonia and potash, but a second sample, **299,** was found to meet the guaranty. The average of the two analyses is 3.78-8.69-3.99 which satisfies the guaranty, except in ammonia, and shows no significant deficiency in money value.

23038. Frisbie's Special 3-8-4, was reported low in total phosphoric acid; a second sample, **23305,** was below guaranty in total phosphoric acid and in potash. Available phosphoric acid was satisfactory in both cases. The average for the two samples is 2.94-8.17-3.82.

22992. Frisbie's 4-8-4 was reported low in ammonia and potash; the second sample, **23274,** was likewise deficient. The average for the two analyses is 3.76-8.51-3.73.

22990. Frisbie's 5-8-7 was low in ammonia, and the second sample, **23273,** was deficient in ammonia and potash. The average of the two analyses was 4.70-8.85-6.79.

22984. Frisbie's 7-5-4 was reported low in ammonia, and the second sample, **162,** was also below guaranty in this respect. The average of both analyses is 6.52-5.65-4.10.

23037. Lowell 5-8-7, and **23041,** Lowell 4-8-4. These two samples were found to be below guaranty in ammonia. Portions of our samples were submitted to the manufacturer and the check results were in close agreement with our figures.

23243. Lowell Tobacco 5-4-5 was found low in ammonia but the second sample, **8,** was not deficient. The average of two analyses is 4.87-5.05-5.26.

23154. Naco Brand 2-8-2. This brand is called 2-8-2 but its actual guaranty is 2.8-11.3-2.8, the idea being that the purchaser is to understand that a pound of this brand will contain the same amount of plant food as one and 2/5 pounds of a 2-8-2 grade. Several other brands of the Nitrate Agencies goods are listed on this "equivalent" plan. Registrations, however, should declare the percentage amounts of elements in the goods as sold. To have the brand indicate one grade and the analysis another leads only to confusion.

23060. Royster's Top Dresser 7-6-5 was found to be low in ammonia. Analysis of a duplicate portion of our sample by the manufacturer confirmed our result.

23189. Virginia-Carolina 4-8-6; **23193,** 3-9-5; and **92,** 8-6-6. Duplicate portions of our samples were sent to the manufacturer and their results were in substantial accord with ours in all cases.

The Rogers and Hubbard Co. advise us that very discordant results for available phosphoric acid have been reported to them by control and by commercial laboratories on their bone-base goods. In this connection it should be noted that so-called "available" phosphoric acid is largely influenced by the method of determining citrate-insoluble phosphoric acid, which method was devised for use upon acid phosphate and which does not accurately evaluate phosphoric acid from other sources such as bone, tankage, etc.

Deficiencies in Money Value.

In eighteen brands deficiencies have amounted to more than a dollar per ton, the values being arrived at by balancing overruns against shortages and reckoning ammonia at 21 cents per pound and available phosphoric acid and potash each at 4 cents per pound. Where more than one sample of a given brand has been analyzed the commercial shortage has been estimated on the basis of the average of the analyses made. The brands thus found deficient are listed in Table XV.

TABLE XV. DEFICIENT BRANDS, 1924.

No.	Brand.	Approximate deficiency in money value per ton
159	A. A. C. Co.'s Patapsco 5-8-7	$1.06
23350, 662	Armour's Big Crop 3-8-4	1.63[1]
23315, 661	Armour's Big Crop 4-6-10	1.40[1]
23358, 173	Armour's Big Crop 5-8-5	1.24[1]
23312, 664	Armour's Big Crop 5-8-7	1.90[1]
23318, 665	Armour's Big Crop 8-6-6	7.84[1]
23398, 172	Atlantic Tobacco Manure 5-8-6	1.17[1]
23335	Bowker's Market Garden Fertilizer	1.39
23357	Bowker's Stockbridge Potato and Vegetable Manure	1.14
22900, 302, 307	Eastern States 7-8-3 No-Filler	4.50[2]
22984, 162	Frisbie's Top Dresser 7-5-4	1.41[1]
23071	Godfrey's Potato Manure 4-8-5	2.44
137, 669	I. A. C. Double Strength Fertilizer 10-8-10	2.60[1]
23435	Nitrate Agencies Naco Brand 5-8-7	2.11
23429	Nitrate Agencies Naco Equivalent 5-8-7	1.63
23060	Royster's Top Dresser	3.13
23468	Royster's Wrapper Brand	2.21
92, 666	Virginia-Carolina Tip Top Brand	2.20[1]

The products of a given manufacturer are more adequately judged on the record over a period of years than on the results of a single inspection. If the data given in Table XV is combined with similar data for the preceding three years and compared with the total number of samples of each manufacturer's goods analyzed in this four-year period, we find that of approximately one thousand samples, about one hundred have shown deficiencies in money value of more than $1.00 per ton. In other words, purchasers have obtained commercial values substantially equal to guaranties, or in excess of the same, in about 90 per cent of the purchases represented. This is shown in more detail in the accompanying tabulation, Table XVI. A manufacturer's name does not appear unless ten or more official samples have been analyzed in the four-year period, and the figures refer to individual samples and not to averages.

[1] Based on average of two analyses.
[2] Based on average of three analyses.

TABLE XVI. COMMERCIAL DEFICIENCIES 1921-1924 INCLUSIVE.

Manufacturer.	Total number of samples.	Number of samples substantially equaling or exceeding guaranty in money value.
American Agricultural Chemical Co.	188	177
Apothecaries Hall Co.	28	28
Armour Fertilizer Works.	47	32
Atlantic Packing Co.	30	26
Berkshire Fertilizer Co.	32	32
Bowker Fertilizer Co.	57	50
The E. D. Chittenden Co.	26	25
E. B. Clark Seed Co.	18	16
The Coe-Mortimer Co.	30	27
Eastern States Farmers' Exchange.	39	32
Essex Fertilizer Co.	31	30
L. T. Frisbie Co.	48	38
International Agricultural Corp.	33	29
Lowell Fertilizer Co.	42	35
Mapes Fertilizer and Peruvian Guano Co.	53	52
New England Fertilizer Co.	33	30
Nitrate Agencies Co.	14	11
Olds & Whipple, Inc.	23	23
Parmenter & Polsey Fertilizer Co.	16	15
The Rogers & Hubbard Co.	53	51
F. S. Royster Guano Co.	30	21
Sanderson Fertilizer & Chemical Co.	34	32
M. L. Shoemaker & Co.	11	11
Springfield Rendering Co.	18	16
Virginia-Carolina Chemical Co.	38	35
Wilcox Fertilizer Co.	31	28
Total.	1003	902

CLASSIFICATION OF GRADES WITH REFERENCE TO AMMONIA.

About 70 per cent of the two hundred and eighty-two samples examined have carried guaranties of ammonia of 4 per cent or over. A tabulation for the last four years shows the distribution of ammonia grades and indicates a decrease in the proportion of low nitrogen goods.

Guaranty.	Percentage of Samples.			
	1921	1922	1923	1924
1 per cent ammonia (0.82 nitrogen).	10.0	6.0	4.2	2.1
2 per cent ammonia (1.65 nitrogen).	20.4	19.1	16.5	12.8
3 per cent ammonia (2.47 nitrogen).	23.2	19.1	16.1	14.9
4 per cent ammonia (3.29 nitrogen).	20.4	25.9	26.1	24.8
5 per cent ammonia (4.11 nitrogen).	21.4	23.0	24.5	27.0
6 per cent ammonia (4.94 nitrogen).	4.6	6.9	4.9	6.7
7 per cent and over (5.76 or more).	....	....	7.7	11.7
Total.	100.0	100.0	100.0	100.0

The "New England Standard Nine."

The number of grades represented by the two hundred and eighty-two samples of complete fertilizers and two of the group containing potash and phosphoric acid only is seventy-four. The number of samples falling in the "Standard Nine" grades is ninety-six; but, if several grades closely corresponding to these are included, the number is increased to one hundred and twenty-seven. What proportion of the total tonnage in this State is represented by the "Standard Nine" cannot be stated at this time. Less than one-half of the samples examined have fallen in the selected grades or those closely corresponding thereto.

In the following summary the "Standard Nine" grades are indicated in full face type.

Grade.	Number of samples.
0-12-6	1
2-12-4	2
3-10-3	5
3-10-4	4
3-10-6	0
4-7-5	1
4-8-4	34
4-8-5	2
4-8-6	9
4-8-7	11
5-4-4	1
5-4-5	25
5-8-6	6
5-8-7	22
8-6-6	4
Total	127

Quality of the Nitrogen in Mixed Fertilizers.

The nitrogen derived from nitrates and from ammonium salts is soluble in water and its utilization by plants is relatively rapid and complete. A portion of the organic nitrogen may also be soluble in water and this is presumably more readily utilized by plants than that portion which is insoluble. For many years it has been the practice of agricultural chemists to evaluate approximately the insoluble organic nitrogen of fertilizers. Two methods are employed for this purpose, both of which depend upon the action of dilute solutions of permanganate of potash upon the nitrogenous material under examination, the one an alkaline solution, the other a neutral solution. The results do not measure the availability of the insoluble nitrogen in the generally accepted sense of that term, but they parallel vegetation tests to the extent that low activity values indicate forms of nitrogen which show poor crop-producing power.

In judging the quality of the insoluble nitrogen it is our practice to apply the alkaline permanganate method in all cases where the amount of the insoluble exceeds 3/10 of one per cent. If less than 50 per cent activity is shown, the neutral method is used, check determinations being made in both cases. Activity values of less than 50 per cent by the alkaline method and less than 80 per cent by the neutral method are interpreted as indicating inferior forms of nitrogenous material.

Four samples this year showed results for active insoluble nitrogen less than the limits just quoted. In two of them the actual amounts of insoluble nitrogen were small (0.3 to 0.4), constituting only about 1/10 and 1/4 respectively of the total nitrogen, and judgment was suspended. In Super-Alphano (**127**) and Woodruff's Home Mixture (**23188**), the insoluble nitrogen constituted 3/5 and 2/5 respectively of the total, and the activity figures were 44.4 and 41.8 per cent respectively by the alkaline method and 55 and 74.2 per cent respectively by the neutral method.

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Aben Hardware Co., New London.		
185	5-10-5 Fertilizer	5-10-5	Poquonock Bridge.
	American Agricultural Chemical Co., New York.		
23382	Agrico Tobacco Manure	7-3-7	Unionville
23263	Complete Potato Mixture	3-8-4	North Haven
23353	Double A Tobacco Fertilizer	5-4-5	New Milford
23261	Fish and Potash	3-10-3	Thompsonville
23354	Grass and Lawn Top Dressing	6-6-4	Farmington
23066	7% Potash Fertilizer	4-8-7	New Britain
23356	Tobacco Fertilizer, 5-4-3	5-4-3	Glastonbury
23268	Universal Phosphate	1-8-2	Norfolk
23376	Bradley's Complete Manure for Poatoes and Vegetables	4-8-7	Stamford
23373	Bradley's Complete Tobacco Manure	5-4-5	Glastonbury
23266	Bradley's Corn Phosphate	2-8-2	Stamford
23264	Bradley's New Method Fertilizer	1-8-2	Meriden
23267	Bradley's Potato Fertilizer	2-8-3	Bethel
23375	Bradley's Potato Manure	3-8-4	Meriden
23374	Bradley's Superior Tobacco Compound	7-3-7	Glastonbury
309	Bradley's Superior Tobacco Compound	7-3-7	Broad Brook
23371	Bradley's XL Superphosphate of Lime	3-9-2	Suffield
23471	National Complete Tobacco Fertilizer	5-4-5	Warehouse Point
23478	National Market Garden Fertilizer	3-8-4	Greenwich
23472	National Potato and Corn Phosphate	2-8-3	Warehouse Point
23480	National Premier Truck Manure	4-8-7	Silver Lane
23470	National White Ash Tobacco Grower	7-3-7	Warehouse Point
23477	National XXX Fish and Potash	3-10-3	Broad Brook
159	Patapsco, 5-8-7	5-8-7	Norwich
158	Patapsco General Truck Fertilizer	3-8-4	Mansfield Center
152	Patapsco Matchless Potash Manure	2-8-2	Putnam
23372	Patapsco Peerless Potato Guano	4-8-4	Guilford
23381	Quinnipiac Corn Manure	2-8-2	Farmington
23378	Quinnipiac Market Garden Manure	4-8-7	Gaylordsville
23380	Quinnipiac Potato Phosphate	2-8-3	Farmington
23377	Quinnipiac Prime Tobacco Manure	7-3-7	Manchester

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH.

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
1.50	1.27	0.30	0.91	3.98	**4.84**	0.48	10.18	**9.70**	5.01	**5.01**	**185**
1.08	0.09	0.27	4.28	5.72	**6.95**	0.33	3.98	**3.65**	0.62	**8.07**	**23382**
0.60	0.79	0.42	0.61	2.42	**2.94**	0.58	8.90	**8.32**	4.08	**4.08**	**23263**
0.92	0.06	0.11	2.98	4.07	**4.95**	0.28	4.80	**4.52**	0.40	**5.00**	**23353**
0.60	0.79	0.49	0.59	2.47	**3.00**	0.77	10.75	**9.98**	3.02	**3.02**	**23261**
2.21	1.25	0.75	0.62	4.83	**5.87**	0.60	7.23	**6.63**	4.00	**4.00**	**23354**
0.64	1.27	0.83	0.57	3.31	**4.02**	1.07	8.90	**7.83**	6.94	**6.94**	**23066**
0.94	0.01	0.18	3.01	4.14	**5.03**	0.35	4.58	**4.23**	0.44	**3.16**	**23356**
0.12	0.32	0.33	0.52	1.29	**1.57**	0.69	8.89	**8.20**	2.24	**2.24**	**23268**
0.65	1.28	0.86	0.49	3.28	**3.99**	1.19	8.96	**7.77**	7.10	**7.10**	**23376**
0.75	0.08	0.16	3.10	4.09	**4.97**	0.25	4.60	**4.35**	0.47	**5.11**	**23373**
0.11	0.46	0.71	0.48	1.76	**2.14**	0.65	8.75	**8.10**	2.23	**2.23**	**23266**
0.20	0.37	0.27	0.60	1.44	**1.75**	0.68	8.88	**8.20**	2.28	**2.28**	**23264**
0.12	0.54	0.55	0.54	1.75	**2.13**	0.85	9.03	**8.18**	3.14	**3.14**	**23267**
0.58	0.81	0.51	0.54	2.44	**2.97**	0.46	8.53	**8.07**	4.27	**4.27**	**23375**
0.88	0.12	0.32	4.26	5.58	**6.78**	0.28	4.08	**3.80**	0.58	**7.41**	**23374**
....	....	....	....	5.58	**6.76**	0.45	3.90	**3.45**	0.51	**6.55**	**309**
0.65	0.74	0.66	0.71	2.76	**3.36**	0.75	10.55	**9.80**	2.57	**2.57**	**23371**
1.04	0.00	0.00	2.94	3.98	**4.84**	0.28	4.65	**4.37**	0.53	**5.30**	**23471**
0.64	0.96	0.77	0.47	2.84	**3.45**	0.73	8.94	**8.21**	3.61	**3 61**	**23478**
0.21	0.52	0.53	0.53	1.79	**2.18**	0.96	8.83	**7.87**	3.18	**3.18**	**23472**
0.80	1.21	0.86	0.47	3.34	**4.06**	1.05	9.23	**8.18**	6.33	**6.33**	**23480**
1.11	0.04	0.10	4.25	5.50	**6.69**	0.30	3.90	**3.60**	0.56	**7.80**	**23470**
0.59	0.76	0.49	0.56	2.40	**2.92**	0.74	10.61	**9.87**	2.96	**2.96**	**23477**
0.87	1.87	0.63	0.63	4.00	**4.86**	0.67	8.57	**7.90**	6.50	**6.50**	**159**
0.57	0.78	0.61	0.44	2.40	**2.92**	0.40	8.32	**7.92**	3.71	**3.71**	**158**
0.02	0.55	0.66	0.55	1.78	**2.16**	0.60	8.85	**8.25**	1.94	**1.94**	**152**
0.78	1.23	0.66	0.56	3.23	**3.93**	1.03	9.02	**7.99**	3.86	**3.86**	**23372**
0.10	0.45	0.56	0.54	1.65	**2.01**	0.58	8.88	**8.30**	2.03	**2.03**	**23381**
0.61	1.31	0.87	0.54	3.33	**4.05**	1.09	8.97	**7.88**	6.66	**6.66**	**23378**
0.00	0.54	0.59	0.54	1.67	**2.03**	0.85	9.10	**8.25**	3.25	**3.25**	**23380**
0.95	0.13	0.22	4.22	5.52	**6.71**	0.45	4.13	**3.68**	0.54	**7.81**	**23377**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	American Agricultural Chemical Co., New York.—*Continued*		
310	Quinnipiac Prime Tobacco Manure	7-3-7	Buckland
23379	Quinnipiac Seed Leaf Tobacco Manure	5-4-5	Gaylordsville
23479	Wheeler's Corn Fertilizer	2-8-2	Plainville
18	Wheeler's Cuban Tobacco Grower	5-4-5	New Milford
17	Wheeler's Potato Manure	2-8-3	Shelton
	Apothecaries Hall Co., Waterbury.		
23216	Liberty, 2-8-2	2-8-2	East Windsor
23186	Liberty Corn, Fruit and All Crops	2-12-4	Woodstock
22995	Liberty Fish Bone and Potash	3-10-4	Meriden
23310	Liberty Fish Bone and Potash	3-10-4	Branford
22996	Liberty High Grade Market Gardeners	5-8-7	Meriden
23321	Liberty High Grade Tobacco Manure	8-4-5	East Windsor
23183	Liberty Market Gardener's Special	4-8-4	Guilford
23313	Liberty Tobacco Special	5-4-5	Middletown
23314	Liberty Top Dresser for Grass and Grain	10-3.5-8	Middletown
	Armour Fertilizer Works, New York.		
23350	Armour's Big Crop, 3-8-4	3-8-4	Danbury
662	Armour's Big Crop, 3-8-4	3-8-4	New Haven
23315	Armour's Big Crop, 4-6-10	4-6-10	Madison
661	Armour's Big Crop, 4-6-10	4-6-10	New Haven
23311	Armour's Big Crop, 4-8-4	4-8-4	Branford
663	Armour's Big Crop, 4-8-4	4-8-4	Danbury
23358	Armour's Big Crop, 5-8-5	5-8-5	Milford
173	Armour's Big Crop, 5-8-5	5-8-5	Milford
23312	Armour's Big Crop, 5-8-7	5-8-7	Guilford
664	Armour's Big Crop, 5-8-7	5-8-7	Madison
23318	Armour's Big Crop, 8-6-6	8-6-6	Wallingford
665	Armour's Big Crop, 8-6-6	8-6-6	New London
23014	Armour's Big Crop Tobacco Special	5-4-5	Danbury
169	Armour's Big Crop Tobacco Special	5-4-5	Danbury
23349	Armour's Corn Grower, 2-8-2	2-8-2	New Canaan

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
....	....	....	....	5.81	**7.06**	0.30	3.85	**3.55**	0.51	**7.12**	**310**
0.68	0.07	0.16	3.14	4.05	**4.92**	0.28	4.33	**4.05**	0.39	**5.58**	**23379**
0.05	0.46	0.68	0.56	1.75	**2.13**	0.95	9.00	**8.05**	2.12	**2.12**	**23479**
0.87	0.03	0.15	3.00	4.05	**4.92**	0.25	4.23	**3.98**	0.39	**5.00**	**18**
0.03	0.50	0.66	0.49	1.68	**2.04**	0.85	9.08	**8.23**	3.01	**3.01**	**17**
1.01	0.14	0.48	0.78	2.41	**2.93**	1.75	10.28	**8.53**	2.26	**2.26**	**23216**
0.00	1.24	0.40	0.11	1.75	**2.13**	1.01	13.01	**12.00**	4.89	**4.89**	**23186**
0.53	1.63	0.56		2.72	**3.31**	0.78	11.13	**10.35**	4.02	**4.02**	**22995**
0.41	1.65	0.36	0.27	2.69	**3.27**	1.00	11.18	**10.18**	4.06	**4.06**	**23310**
1.05	2.90	0.30		4.25	**5.17**	0.49	8.67	**8.18**	7.10	**7.10**	**22996**
0.01	3.19	0.40	3.03	6.63	**8.06**	0.23	6.25	**6.02**	0.64	**6.23**	**23321**
0.80	2.07	0.09	0.35	3.31	**4.02**	0.95	9.10	**8.15**	4.36	**4.36**	**23183**
0.02	1.27	0.37	2.43	4.09	**4.97**	0.25	5.33	**5.08**	0.58	**7.65**	**23313**
4.69	3.00	0.51	0.52	8.72	**10.60**	1.03	6.35	**5.32**	9.63	**9.63**	**23314**
0.23	0.47	0.34	0.78	1.82	**2.21**	0.61	8.53	**7.92**	4.95	**4.95**	**23350**
....	....	....	....	2.50	**3.04**	0.40	7.55	**7.05**	....	**3.86**	**662**
2.25	0.37	0.42	0.58	3.62	**4.40**	0.40	6.26	**5.86**	9.43	**9.43**	**23315**
....	....	....	....	2.78	**3.38**	0.36	6.08	**5.72**	....	**8.64**	**661**
0.53	1.22	0.44	1.15	3.34	**4.06**	0.73	8.47	**7.74**	4.54	**4.54**	**23311**
....	....	....	....	3.05	**3.71**	1.38	9.43	**8.05**	....	**4.21**	**663**
0.83	1.08	0.51	1.05	3.47	**4.22**	0.61	8.68	**8.07**	6.50	**6.50**	**23358**
....	....	....	....	3.84	**4.67**	0.59	8.20	**7.61**	....	**6.50**	**173**
0.46	1.95	0.40	0.93	3.74	**4.55**	0.68	8.75	**8.07**	6.45	**6.45**	**23312**
....	....	....	....	3.98	**4.84**	0.75	9.83	**9.08**	....	**4.81**	**664**
1.38	1.69	0.50	1.33	4.90	**5.96**	0.55	6.68	**6.13**	8.77	**8.77**	**23318**
....	....	....	....	4.34	**5.28**	0.70	9.43	**8.73**	....	**5.74**	**665**
0.59	0.06	0.16	3.02	3.83	**4.66**	0.54	4.78	**4.24**	0.73	**4.60**	**23014**
....	....	....	....	4.12	**5.01**	0.75	5.20	**4.45**	....	**5.15**	**169**
0.12	0.62	0.32	0.59	1.65	**2.01**	0.88	9.00	**8.12**	2.18	**2.18**	**23349**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Atlantic Packing Co., New Haven.		
23337	Atlantic, 4-8-6	4-8-6	Cromwell
23331	Atlantic, 5-8-7	5-8-7	Manchester
23127	Atlantic Grain Fertilizer, 2-8-2	2-8-2	"
23126	Atlantic Potato Phosphate, 3-8-4	3-8-4	"
23332	Atlantic Special Vegetable, 4-8-4	4-8-4	"
172	Atlantic Tobacco Manure, 5-8-6	5-8-6	Glastonbury
23398	Atlantic Tobacco Manure, 5-8-6	5-8-6	Cromwell
23391	Atlantic Top Dresser, 7-5-4	7-5-4	Manchester
	F. A. Bartlett Tree Expert Co., Stamford.		
300	Bartlett's Green Tree Food	6-8-4	Stamford
	Berkshire Fertilizer Co., Bridgeport.		
23214	Berkshire Complete Fertilizer	3-8-3	New Canaan
23125	Berkshire Complete Tobacco	5-3-5	Windsor Locks
5	Berkshire Complete Tobacco	5-3-5	Talcottville
23394	Berkshire Economical Grass Fertilizer	10-3-8	Bridgeport
23225	Berkshire Grass Special	7-2-4	Windsor Locks
23135	Berkshire Long Island Special	5-8-7	Litchfield
23219	Berkshire Market Garden	4-8-4	Litchfield
23209	Berkshire Potato and Vegetable Phosphate	2-8-4	Branford
23399	Berkshire Tobacco Special	7-3-5	Suffield
	F. E. Boardman, Middletown.		
150	Boardman's Complete Fertilizer for Potatoes and General Crops	4-7-4	Middletown
156	Boardman's Tobacco Fertilizer	4-7-4	Middletown
	Bowker Fertilizer Co., New York.		
23329	Bowker's All Round Fertilizer	3-8-4	Meriden
23360	Bowker's Conn. Valley Tobacco Fertilizer	5-4-3	Hazardville
23232	Bowker's Corn, Grain and Grass Phosphate	2-8-2	Colchester
23333	Bowker's Fisherman's Fish and Potash	3-10-3	Meriden
23335	Bowker's Market Garden Fertilizer	4-8-4	Colchester
23229	Bowker's Potato and Vegetable Phosphate	2-8-3	Meriden
23336	Bowker's Square Brand Farm and Garden Phosphate	2-8-2	Unionville

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
0.94	0.93	0.61	0.95	3.43	**4.17**	0.58	9.45	**8.87**	6.14	**6.14**	**23337**
1.52	0.85	0.67	1.00	4.04	**4.91**	0.68	9.40	**8.72**	7.24	**7.24**	**23331**
0.06	0.83	0.35	0.41	1.65	**2.01**	0.38	8.34	**7.96**	2.17	**2.17**	**23127**
0.00	1.40	0.44	0.57	2.41	**2.93**	0.60	8.79	**8.19**	3.99	**3.99**	**23126**
0.97	0.79	0.56	0.82	3.14	**3.82**	0.48	9.00	**8.52**	4.40	**4.40**	**23332**
1.11	0.70	0.77	1.34	3.92	**4.77**	0.60	9.20	**8.60**	1.02	**6.08**	**172**
1.23	0.56	0.62	1.24	3.65	**4.44**	0.78	9.00	**8.22**	0.94	**6.26**	**23398**
2.41	1.48	0.92	0.80	5.61	**6.82**	0.40	5.95	**5.55**	4.34	**4.34**	**23391**
....	....	....	....	5.06	**6.15**	2.49	9.31	**6.82**	4.33	**4.33**	**300**
0.92	0.67	0.47	0.61	2.67	**3.25**	0.83	9.38	**8.55**	3.81	**3.81**	**23214**
0.78	0.17	0.43	2.59	3.97	**4.83**	0.58	4.35	**3.77**	0.93	**6.12**	**23125**
....	....	....	....	4.29	**5.22**	0.43	4.43	**4.00**	....	**5.43**	**5**
1.35	5.34	0.53	1.02	8.24	**10.02**	7.18	11.03	**3.85**	8.59	**8.92**	**23394**
2.86	0.47	0.62	1.73	5.68	**6.91**	1.85	6.95	**5.10**	4.26	**4.26**	**23225**
1.36	1.31	0.91	0.89	4.47	**5.43**	1.03	9.30	**8.27**	7.84	**7.84**	**23135**
0.66	1.21	0.79	0.74	3.40	**4.13**	1.00	9.45	**8.45**	4.25	**4.78**	**23219**
0.50	0.31	0.42	0.52	1.75	**2.13**	1.13	10.07	**8.94**	3.59	**3.59**	**23209**
1.59	0.12	0.61	3.34	5.66	**6.88**	0.48	4.35	**3.87**	1.05	**5.91**	**23399**
0.61	0.76	0.67	1.19	3.23	**3.93**	1.23	8.68	**7.45**	4.42	**4.42**	**150**
0.24	0.97	0.37	1.99	3.57	**4.34**	0.55	7.88	**7.33**	1.10	**4.93**	**156**
0.58	0.83	0.60	0.50	2.51	**3.05**	0.55	8.69	**8.14**	4.33	**4.33**	**23329**
0.92	0.07	0.08	3.30	4.37	**5.31**	0.38	5.05	**4.67**	0.24	**3.13**	**23360**
0.04	0.55	0.56	0.52	1.67	**2.03**	0.68	8.81	**8.13**	2.00	**2.00**	**23232**
0.60	0.75	0.60	0.58	2.53	**3.08**	0.67	10.68	**10.01**	3.04	**3.04**	**23333**
0.62	1.27	0.56	0.57	3.02	**3.67**	0.73	8.85	**8.12**	3.88	**3.88**	**23335**
0.02	0.51	0.58	0.56	1.67	**2.03**	0.88	9.00	**8.12**	3.17	**3.17**	**23229**
0.09	0.51	0.57	0.58	1.75	**2 13**	0.85	9.00	**8.15**	2.22	**2.22**	**23336**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station: **Bowker Fertilizer Co., New York.** *—Continued*		
23319	Bowker's Sure Crop Phosphate....	1-8-2	Willimantic.....
23357	Stockbridge Potato and Vegetable Manure.....	4-6-10	Brooklyn.....
23359	Stockbridge Premier Tobacco Grower.....	7-3-7	South Windsor....
23351	Stockbridge Truck Manure.....	4-8-7	Waterbury.....
23352	Stockbridge Tobacco Manure.....	5-4-5	Suffield.....
23355	Stockbridge Top Dressing and Forcing Manure	6-6-4	Meriden.....
	A. D. Bridges' Sons, Inc., Hazardville.		
23316	Corn, Onion and Potato and General Purpose.....	4-8-4	Hazardville.....
23320	Special Tobacco Fertilizer.....	5-3-5	Hazardville. .....
	The E. D. Chittenden Co., Bridgeport.		
23299	Chittenden's Complete Grain.....	2-8-3	Abington.....
668	Chittenden's Complete Grain.....	2-8-3	Glastonbury.....
134	Chittenden's Complete Tobacco and Onion Grower.....	4-8-4	Somers.....
130	Chittenden's High Grade Tobacco, 7½% Potash.....	6.5-3-7.5	Glastonbury.....
23293	Chittenden's Potato Special, 4% Potash.....	4-8-4	Glastonbury.....
502	Chittenden's Potato Special, 4% Potash.....	4-8-4	Abington.....
23301	Chittenden's Potato Special, 4% Potash.....	4-8-4	Glastonbury.....
23217	Chittenden's Potato Special, 6% Potash.....	4-8-6	Windsor Locks....
129	Chittenden's Tobacco Special, 5% Potash.....	5-4-5	Windsor Locks....
135	Chittenden's Vegetable and Onion Grower.....	3-8-3	Somers.....
	E. B. Clark Seed Co., Milford.		
23392	Clark's Special Mixture for General Use.....	4-8-4	Milford.....
299	Clark's Special Mixture for General Use.....	4-8-4	Milford.....
12	Clark's Special Mixture for General Use.....	4-10-4	Branford.....

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.					Ammonia equivalent to total nitrogen	Phosphoric Acid.			Potash.		Station No.
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	
%	%	%	%	%	%	%	%	%	%	%	
0.01	0.24	0.32	0.27	0.84	**1.02**	0.56	8.15	**7.59**	1.72	**1.72**	23319
0.75	1.22	0.41	0.68	3.06	**3.72**	0.55	6.65	**6.10**	9.95	**9.95**	23357
1.09	0.08	0.19	4.28	5.64	**6.86**	0.38	4.20	**3.82**	0.53	**7.58**	23359
0.67	1.26	0.70	0.53	3.16	**3.84**	0.98	9.00	**8.02**	7.02	**7.02**	23351
1.11	0.05	0.01	2.99	4.16	**5.06**	0.28	4.50	**4.22**	0.51	**4.94**	23352
2.66	1.22	0.45	0.61	4.94	**6.01**	0.63	7.05	**6.42**	4.47	**4.47**	23355
0.88	1.15	0.46	1.21	3.70	**4.50**	0.78	9.35	**8.57**	4.23	**5.21**	23316
0.95	0.08	0.12	3.29	4.44	**5.40**	0.35	4.18	**3.83**	0.66	**6.06**	23320
0.48	0.41	0.13	0.40	1.42	**1.73**	0.38	8.53	**8.15**	2.99	**2.99**	23299
....	....	....	....	1.88	**2.29**	0.68	8.68	**8.00**	....	**3.13**	668
0.49	1.85	0.25	0.59	3.18	**3.87**	0.40	8.70	**8.30**	1.01	**4.04**	134
0.15	2.54	0.25	2.41	5.35	**6.50**	0.23	5.95	**5.72**	0.70	**7.57**	130
0.26	2.03	0.34	0.61	3.24	**3.94**	0.37	8.08	**7.71**	2.39	**4.80**	23293
....	....	....	....	3.18	**3.87**	....	8.75	....	....	**5.12**	502
....	....	....	....	3.42	**4.16**	....	9.00	....	....	**3.90**	23301
0.30	1.48	0.53	0.62	2.93	**3.56**	0.44	8.44	**8.00**	7.49	**7.49**	23217
0.11	2.08	0.13	1.43	3.75	**4.56**	0.25	5.23	**4.98**	2.33	**6.77**	129
0.87	1.45	0.20	0.60	3.12	**3.79**	0.93	8.93	**8.00**	3.76	**3.76**	135
0.57	1.24	0.47	0.60	2.88	3.50	1.18	9.80	**8.62**	3.66	**3.66**	23392
....	....	....	....	3.33	**4.05**	0.78	9.53	**8.75**	4.31	**4.31**	299
0.00	2.51	0.36	0.56	3.43	**4.17**	0.55	11.28	**10.73**	4.10	**4.10**	12

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	E. B. Clark Seed Co., Milford.— *Continued*		
23389	Clark's Special Potash Mixture, 4-8-6	4-8-6	Milford
11	Clark's Tip Top Brand, 4-8-4	4-8-4	Branford
23390	Clark's Tip Top Brand, 5-8-5	5-8-5	Milford
	The Coe-Mortimer Co., New York.		
23231	E. Frank Coe's Celebrated Special Potato Fertilizer	4-8-4	Colchester
23230	E. Frank Coe's Columbian Corn and Potato Fertilizer	2-8-3	Saybrook
23340	E. Frank Coe's Connecticut Wrapper Grower	5-4-5	Suffield
23132	E. Frank Coe's Gold Brand Excelsior Guano	3-8-4	New Canaan
23226	E. Frank Coe's New Englander Special	1-8-2	Bethel
23136	E. Frank Coe's Red Brand Excelsior Guano	4-8-7	Farmington
23334	E. Frank Coe's Special Grass Top Dressing	6-6-4	Colchester
	C. A. Cowles, Plantsville.		
23317	C. A. Cowles', 4-8-4 Fertilizer	4-8-4	Plantsville
	Eastern States Farmers' Exchange, Springfield, Mass.		
22876	Eastern States, 3-12-3 No Filler	3-12-3	South Windsor
306	Eastern States, 3-12-3 No Filler	3-12-3	Ellington
22907	Eastern States, 5-8-7 No Filler	5-8-7	Ellington
314	Eastern States, 5-8-7 No Filler	5-8-7	Farmington
22866	Eastern States, 5-10-5 No Filler	5-10-5	Milford
301	Eastern States, 5-10-5 No Filler	5-10-5	Ellington
22900	Eastern States, 7-8-3 No Filler	7-8-3	South Windsor
302	Eastern States, 7-8-3 No Filler	7-8-3	Ellington
307	Eastern States, 7-8-3 No Filler	7-8-3	Ellington
23044	Eastern States, 4-8-4	4-8-4	Guilford
154	Eastern States, 6-3-5	6-3-5	Ellington
304	Eastern States, 6-3-5	6-3-5	Ellington
22901	Eastern States, 6-3½-7	6-3.5-7	South Windsor
23397	Eastern States, 6¼-3-5	6.25-3-5	Ellington
303	Eastern States, 6¼-3-5	6.25-3-5	"
23396	Eastern States, 7-2-7	7-2-7	"
22908	Eastern States Tobacco Fertilizer, Formula C	6-3-5	"

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
0.00	1.91	0.60	0.82	3.33	**4.05**	1.08	9.35	**8.27**	6.21	**6.21**	**23389**
0.13	1.42	0.58	1.19	3.32	**4.04**	1.53	9.60	**8.07**	4.83	**4.83**	**11**
0.82	1.63	0.81	0.90	4.16	**5.06**	1.23	9.45	**8.22**	5.14	**5.14**	**23390**
0.94	1.15	0.49	0.63	3.21	**3.90**	0.81	8.81	**8.00**	3.92	**3.92**	**23231**
0.13	0.45	0.54	0.55	1.67	**2.03**	0.77	8.83	**8.06**	3.15	**3.15**	**23230**
0.88	0.07	0.00	2.93	3.88	**4.72**	0.23	4.60	**4.37**	0.43	**5.13**	**23340**
0.59	0.78	0.73	0.47	2.57	**3.12**	0.46	8.51	**8.05**	4.31	**4.31**	**23132**
0.14	0.31	0.44	0.56	1.45	**1.76**	0.70	8.90	**8.20**	2.22	**2.22**	**23226**
0.82	1.27	0.64	0.49	3.22	**3.91**	0.95	8.70	**7.75**	7.32	**7.32**	**23136**
2.78	1.57	0.17	0.55	5.07	**6.16**	0.95	7.50	**6.55**	4.43	**4.43**	**23334**
0.58	1.59	0.41	0.50	3.08	**3.74**	0.15	8.28	**8.13**	4.36	**4.36**	**23317**
0.74	0.60	0.48	0.54	2.36	**2.87**	0.87	12.88	**12.01**	3.09	**3.09**	**22876**
....	....	....	....	2.50	**3.04**	0.91	12.05	**11.14**	3.19	**3.19**	**306**
2.12	0.77	0.33	0.59	3.81	**4.63**	0.64	8.83	**8.19**	6.47	**6.64**	**22907**
....	....	....	....	4.17	**5.07**	0.78	9.20	**8.42**	6.32	**6.32**	**314**
0.85	2.08	0.29	0.75	3.97	**4.83**	0.65	10.76	**10.11**	5.00	**5.11**	**22866**
....	....	....	....	3.89	**4.73**	0.92	10.67	**9.75**	4.85	**4.85**	**301**
1.77	1.52	0.31	0.58	4.18	**5.08**	0.51	8.53	**8.02**	4.59	**4.59**	**22900**
....	....	....	....	4.61	**5.60**	0.70	9.53	**8.83**	2.93	**2.93**	**302**
....	....	....	....	5.51	**6.70**	1.65	9.27	**7.62**	2.22	**3.02**	**307**
1.13	1.16	0.36	0.49	3.14	**3.82**	0.60	9.73	**9.13**	3.85	**3.85**	**23044**
0.59	0.18	0.07	4.06	4.90	**5.93**	0.33	4.98	**4.65**	1.05	**5.90**	**154**
....	....	....	....	4.42	**5.37**	0.25	5.25	**5.00**	1.86	**5.82**	**304**
1.56	0.18	0.30	3.46	5.50	**6.69**	0.43	5.80	**5.37**	1.02	**7.50**	**22901**
0.19	0.94	0.44	3.88	5.45	**6.63**	0.45	5.33	**4.88**	1.26	**5.46**	**23397**
....	....	....	....	5.05	**6.14**	0.58	5.25	**4.67**	1.02	**6.12**	**303**
1.38	0.05	0.70	3.37	5.50	**6.69**	2.50	5.68	**3.18**	1.25	**9.10**	**23396**
0.55	0.28	0.60	3.50	4.93	**5.99**	0.23	5.35	**5.12**	1.13	**6.36**	**22908**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Essex Fertilizer Co., Boston, Mass.		
20	Essex 2-8-2 for Farm and Garden..	2-8-2	Hartford.....
22	Essex 2-8-3 for All Crops.....	2-8-3	Plainville
15	Essex Fish Fertilizer for all Crops..	3-8-4	South Manchester.
14	Essex Market Garden for Potatoes, Roots and Vegetables.....	4-8-4	South Manchester.
16	Essex 4-6-10 for Potatoes and Vegetables.....	4-6-10	South Manchester.
21	Essex 5-8-7 for Potatoes and Vegetables.....	5-8-7	Hartford.....
13	Essex Potato Phosphate, 4-8-7....	4-8-7	South Manchester.
23	Essex Special Tobacco 5-4-5.....	5-4-5	Wapping.....
24	Essex Tobacco Manure, 5-8-6.....	5-8-6	West Suffield.....
	L. T. Frisbie Co., New Haven.		
22955	Frisbie's, 4-10-6.....	4-10-6	Woodmont.....
22990	Frisbie's, 5-8-7.....	5-8-7	Clintonville.....
23273	Frisbie's, 5-8-7.....	5-8-7	Wethersfield.....
23042	Frisbie's Corn and Grain Fertilizer, 2-8-2.....	2-8-2	Danbury.....
23245	Frisbie's Market Garden, 4-8-6....	4-8-6	Torrington.....
23038	Frisbie's Special, 3-8-4.....	3-8-4	North Haven.....
23305	Frisbie's Special, 3-8-4.....	3-8-4	Wallingford.....
22992	Frisbie's Special Potato and Vegetable Grower, 4-8-4.....	4-8-4	Wethersfield.....
23274	Frisbie's Special Potato and Vegetable Grower, 4-8-4.....	4-8-4	Danbury.....
23338	Frisbie's Tobacco Manure, 5-8-6...	5-8-6	Burnside.....
23339	Frisbie's Special Tobacco Grower, 5-4-5.....	5-4-5	Ellington.....
22984	Frisbie's Top Dresser, 7-5-4.....	7-5-4	New Haven.....
162	Frisbie's Top Dresser, 7-5-4.....	7-5-4	Pequabuck.....
	Godfrey Fertilizer and Chemical Co., Newark, N. J.		
23070	Godfreys' Potato and Truck Grower, 4-8-4.....	4-8-4	Westport.....
23071	Godfrey's Potato Manure, 4-8-5...	4-8-5	Westport.....
	International Agricultural Corp., Boston, Mass.		
101	Buffalo Crop Grower.....	5-8-7	Simsbury.....
98	Buffalo General Favorite.....	3-10-4	Hazardville.....
97	Buffalo High Grade Manure.....	4-6-10	Manchester.....
100	Buffalo New England Special.....	2-12-4	West Suffield.....

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
0.05	0.93	0.30	0.49	1.77	**2.15**	0.38	8.69	**8.31**	2.06	**2.06**	**20**
0.24	0.55	0.30	0.58	1.67	**2.03**	0.68	9.53	**8.85**	3.07	**3.07**	**22**
0.78	0.60	0.32	0.79	2.49	**3.03**	0.78	9.38	**8.60**	4.06	**4.06**	**15**
1.15	0.78	0.59	0.80	3.32	**4.04**	0.60	8.64	**8.04**	3.96	**3.96**	**14**
1.08	0.73	0.76	0.77	3.34	**4.06**	0.55	7.18	**6.63**	10.13	**10.13**	**16**
1.27	0.96	0.90	1.00	4.13	**5.02**	0.75	9.28	**8.53**	7.50	**7.50**	**21**
1.25	0.76	0.68	0.77	3.46	**4.21**	0.63	8.69	**8.06**	7.35	**7.35**	**13**
1.12	0.58	0.62	1.91	4.23	**5.14**	0.25	5.25	**5.00**	0.64	**5.19**	**23**
1.55	0.13	0.44	2.06	4.18	**5.08**	1.23	10.00	**8.77**	1.46	**6.01**	**24**
0.97	0.91	0.49	0.85	3.22	**3.91**	0.95	11.81	**10.86**	6.21	**6.21**	**22955**
1.39	0.91	0.78	0.86	3.94	**4.79**	0.53	9.34	**8.81**	6.54	**6.93**	**22990**
....	1.16	0.85	1.78	3.79	**4.61**	0.50	9.38	**8.88**	6.66	**6.66**	**23273**
0.03	0.83	0.34	0.48	1.68	**2.04**	0.46	8.40	**7.94**	2.08	**2.08**	**23042**
0.94	0.93	0.59	0.81	3.27	**3.98**	0.45	9.18	**8.73**	5.85	**5.85**	**23245**
0.89	0.55	0.28	0.67	2.39	**2.91**	0.65	8.75	**8.10**	3.89	**3.89**	**23038**
0.83	0.62	....	....	2.44	**2 97**	0.45	8.68	**8.23**	3.75	**3.75**	**23305**
0.83	0.81	1.01	0.50	3.15	**3.83**	0.44	9.02	**8.58**	3.65	**3.81**	**22992**
....	0.80	0.79	1.44	3.03	**3.68**	0.40	8.83	**8.43**	3.64	**3.64**	**23274**
1.41	0.56	0.43	1.45	3.85	**4.68**	0.80	9.40	**8.60**	1.08	**6.17**	**23338**
0.98	0.59	0.46	1.91	3.94	**4.79**	0.28	5.08	**4.80**	0.69	**5.59**	**23339**
2.65	1.58	0.45	0.69	5.37	**6.53**	0.27	5.80	**5.53**	4.05	**4.30**	**22984**
....	....	....	....	5.35	**6.50**	0.28	6.05	**5.77**	....	**3.89**	**162**
0.64	0.83	0.79	0.96	3.22	**3.91**	1.48	9.56	**8.08**	4.16	**4.16**	**23070**
0.10	1.37	0.42	0.92	2.81	**3.42**	0.51	8.35	**7.84**	5.15	**5.15**	**23071**
0.00	2.40	0.76	1.09	4.25	**5.17**	0.55	8.15	**7.60**	7.05	**7.05**	**101**
0.26	1.01	0.37	0.70	2.34	**2.84**	0.43	10.39	**9.96**	4.26	**4.26**	**98**
0.00	1.77	0.70	0.69	3.16	**3.84**	0.23	6.41	**6.18**	10.44	**10.44**	**97**
0.28	0.65	0.32	0.54	1.79	**2.18**	0.72	12.59	**11.87**	4.20	**4.20**	**100**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station: **International Agricultural Corp., Boston, Mass.**—*Continued*		
95	Buffalo Tobacco Producer	5.5-6-5.5	Manchester
137	Double Strength Fertilizer, 10-8-10	10-8-10	West Suffield
669	Double Strength Fertilizer, 10-8-10	10-8-10	Manchester
91	I. A. C. Connecticut Valley Special	7-6-5	Glastonbury
	Lowell Fertilizer Co., Boston, Mass.		
22875	Lowell Animal Brand, 3-8-4	3-8-4	Cheshire
23244	Lowell Bone Fertilizer, 2-8-2	2-8-2	Shelton
22873	Lowell Potato Phosphate, 4-8-7	4-8-7	Cheshire
23246	Lowell 4-6-10 for Potatoes and Vegetables	4-6-10	Moosup
23041	Lowell 4-8-4 for Potatoes, Corn and Vegetables	4-8-4	Southport
23037	Lowell 5-8-7 for Potatoes and Vegetables	5-8-7	Warehouse Point
23243	Lowell Tobacco 5-4-5 for Tobacco, Fruits and Vines	5-4-5	Warehouse Point
8	Lowell Tobacco 5-4-5 for Tobacco, Fruits and Vines	5-4-5	Windsor
23400	Lowell Tobacco Manure, 5-8-6	5-8-6	East Hartford
22874	Lowell Top Dressing, 7-5-2	7-5-2	Cheshire
	Mapes Fertilizer and Peruvian Guano Co., New York.		
23410	The Mapes Connecticut Valley Special	6-4-7	Suffield
23128	The Mapes Corn Manure	3-8-3	Meriden
23415	The Mapes General Tobacco Manure	5-4-5	Hartford
23330	The Mapes General Truck Manure	5-6-5	Hartford
23414	The Mapes General Use Manure	3-6-4	West Cheshire
23412	The Mapes Grain Brand	2-8-2	Hartford
23411	The Mapes Onion Manure	4-6-4	Hartford
23134	The Mapes Potato Manure	4-7-5	Hazardville
22950	The Mapes Tobacco Ash Constituents	1-4-15	Suffield
23408	The Mapes Tobacco Starter Improved	5-6-1	Windsor Locks
23409	The Mapes Top Dresser	10-4-2	Windsor Locks
23413	The Mapes Tobacco Manure Wrapper Brand	7.5-2-10.5	Warehouse Point

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.					Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	
%	%	%	%	%	%	%	%	%	%	%	
0.00	2.21	0.41	1.91	4.53	**5.51**	0.18	5.55	**5.37**	0.74	**5.74**	**95**
0.09	4.54	0.31	2.60	7.54	**9.17**	0.41	8.67	**8.26**	1.59	**9.88**	**137**
....	....	....	....	7.88	**9.58**	1.18	8.62	**7.44**	....	**10.39**	**669**
0.77	1.23	0.48	3.22	5.70	**6.93**	2.65	8.80	**6.15**	0.52	**5.77**	**91**
0.87	0.60	0.28	0.85	2.60	**3.16**	0.72	9.22	**8.50**	4.25	**4.40**	**22875**
0.06	0.57	0.36	0.57	1.56	**1.89**	0.73	8.93	**8.20**	2.13	**2.13**	**23244**
1.16	0.80	0.64	0.74	3.34	**4.06**	0.68	9.01	**8.33**	6.99	**7.10**	**22873**
1.05	0.78	0.63	0.87	3.33	**4.05**	0.55	7.03	**6.48**	10.21	**10.21**	**23246**
1.05	0.76	0.43	0.89	3.13	**3.81**	0.78	9.03	**8.25**	3.97	**3.97**	**23041**
1.18	0.81	0.93	1.04	3.96	**4.81**	0.85	8.94	**8.09**	6.89	**6.89**	**23037**
0.92	0.51	0.60	1.87	3.90	**4.74**	0.35	5.25	**4.90**	0.58	**5.46**	**23243**
....	....	....	....	4.11	**5.00**	0.20	5.40	**5.20**	....	**5.05**	**8**
1.48	0.13	0.44	2.05	4.10	**4.98**	1.28	9.98	**8.70**	2.30	**6.89**	**23400**
0.00	5.21	0.09	0.17	5.47	**6.65**	0.13	5.85	**5.72**	2.14	**2.14**	**22874**
1.85	0.64	0.89	1.73	5.11	**6.21**	0.95	5.30	**4.35**	0.94	**8.46**	**23410**
0.90	0.29	0.36	1.18	2.73	**3.32**	1.25	10.33	**9.08**	2.34	**3.67**	**23128**
1.10	0.51	0.90	1.76	4.27	**5.19**	2.05	5.30	**3.25**	0.78	**6.08**	**23415**
2.11	0.47	0.42	1.40	4.40	**5.35**	0.70	9.33	**8.63**	2.64	**5.98**	**23330**
0.84	0.40	0.41	1.13	2.78	**3.38**	1.20	9.90	**8.70**	3.22	**4.72**	**23414**
0.37	0.23	0.18	1.07	1.85	**2.25**	1.43	11.33	**9.90**	2.86	**2.86**	**23412**
1.47	0.20	0.29	0.92	2.88	**3.50**	0.65	8.53	**7.88**	0.54	**5.51**	**23411**
1.41	0.21	0.23	1.10	2.95	**3.59**	1.15	9.40	**8.25**	3.69	**5.50**	**23134**
....	....	....	....	1.19	**1.45**	1.68	6.82	**5.14**	1.04	**15.03**	**22950**
1.76	0.44	0.73	1.28	4.21	**5.12**	1.65	9.73	**8.08**	0.62	**2.30**	**23408**
4.59	0.34	1.93	1.00	7.86	**9.56**	0.75	6.60	**5.85**	2.95	**3.92**	**23409**
1.80	0.67	1.08	2.93	6.48	**7.88**	1.43	5.38	**3.95**	1.21	**11.46**	**23413**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	W. L. Mitchell, New Haven.		
9	5-8-7 Fertilizer	5-8-7	New Haven
175	5-8-7 Fertilizer	5-8-7	New Haven
	New England Fertilizer Co., Boston, Mass.		
23291	New England Corn Phosphate, 2-8-2	2-8-2	Rockville
38	New England Potato Phosphate, 4-8-7	4-8-7	Unionville
23290	New England Superphosphate, 3-8-4	3-8-4	Rockville
23300	New England 5-8-7 for Potatoes and Market Gardens	5-8-7	Meriden
32	New England Tobacco 5-4-5	5-4-5	Warehouse Point
23295	New England 2-8-3 for Vegetables and Grain	2-8-3	Hamburg
39	New England 4-8-4 for Potatoes, Vegetables and Grass	4-8-4	Hamburg
41	New England Tobacco Manure, 5-8-6	5-8-6	Warehouse Point
	Nitrate Agencies Co., New York.		
23154	Naco Brand, 2-8-2	2.8-11.4-2.8	Danbury
23428	Naco Brand, 4-8-4	4-8-4	Westport
23427	Naco Brand, 4-8-7	4-8-7	Westport
23435	Naco Brand, 5-8-7	5-8-7	Canton Center
23429	Naco Brand Equivalent 5-8-7 Genuine Peruvian Guano Mixture	5.7-9.1-8.0	Greens Farms
23419	Naco Brand Peruvian Guano	12-10-2.5	Suffield
23149	Naco Brand No. 12 Peruvian Guano Mixture	5.2-10.5-5.2	Westport
667	Naco Brand No. 12 Peruvian Guano Mixture	5.2-10.5-5.2	Danbury
23155	Naco Brand No. 14 Peruvian Guano Mixture	4.9-9.9-8.6	Danbury
	Olds & Whipple, Inc., Hartford.		
33	Blue Label Tobacco Fertilizer	6-3-6	Warehouse Point
35	Complete Corn, Potato and Onion Fertilizer	4-8-4	South Manchester.
23190	Complete Tobacco Fertilizer	5-3-5	Warehouse Point

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.					Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	
%	%	%	%	%	%	%	%	%	%	%	
0.71	2.08	0.52	0.68	3.99	**4.85**	0.53	8.55	**8.02**	6.60	**6.60**	**9**
....	....	....	....	3.85	**4.68**	3.10	11.55	**8.45**	....	**6.22**	**175**
0.07	0.70	0.21	0.66	1.64	**1.99**	0.93	9.75	**8.82**	2.23	**2.23**	**23291**
0.96	0.71	0.83	0.69	3.19	**3.88**	0.63	8.96	**8.33**	6.53	**6.53**	**38**
0.78	0.63	0.31	0.79	2.51	**3.05**	0.65	9.10	**8.45**	4.23	**4.23**	**23290**
0.85	1.10	1.13	0.91	3.99	**4.85**	0.95	9.85	**8.90**	7.23	**7.23**	**23300**
1.27	0.40	0.55	1.85	4.07	**4.95**	0.45	5.55	**5.10**	0.49	**5.13**	**32**
0.03	0.76	0.22	0.60	1.61	**1.96**	0.49	8.37	**7.88**	3.19	**3.19**	**23295**
1.29	0.78	0.53	0.80	3.40	**4.13**	0.58	9.03	**8.45**	4.24	**4.24**	**39**
1.65	0.10	0.46	2.00	4.21	**5.12**	1.05	9.38	**8.33**	1.45	**5.95**	**41**
0.49	0.77	0.54	0.44	2.24	**2.72**	0.93	12.95	**12.02**	2.58	**3.05**	**23154**
0.43	1.49	0.62	0.57	3.11	**3.78**	0.48	9.03	**8.55**	6.17	**6.17**	**23428**
0.50	1.37	0.63	0.70	3.20	**3.89**	0.59	8.28	**7.69**	7.30	**7.30**	**23427**
0.74	1.81	0.51	0.62	3.68	**4.47**	0.85	9.63	**8.78**	5.91	**6.37**	**23435**
0.74	2.05	0.67	0.92	4.38	**5.33**	0.93	10.60	**9.67**	7.08	**7.32**	**23429**
0.00	4.50	1.91	3.77	10.18	**12.38**	1.55	12.05	**10.50**	2.65	**2.65**	**23419**
0.34	1.95	0.56	1.14	3.99	**4.85**	0.77	10.59	**9.82**	5.58	**5.81**	**23149**
....	....	....	....	4.20	**5.11**	0.63	10.90	**10.27**	....	**8.07**	**667**
0.31	1.72	0.80	1.17	4.00	**4.86**	0.90	11.00	**10.10**	8.64	**8.64**	**23155**
1.02	0.10	0.11	3.89	5.12	**6.22**	0.23	4.33	**4.10**	0.69	**7.06**	**33**
0.88	1.06	0.16	1.25	3.35	**4.07**	1.10	9.83	**8.73**	4.32	**4.32**	**35**
1.19	0.00	0.00	3.04	4.23	**5.14**	0.28	4.28	**4.00**	0.70	**5.76**	**23190**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Olds & Whipple, Inc., Hartford.— *Continued.*		
37	Fish and Potash	3-6-5	Hartford
23195	High Grade Starter and Potash Compound	5-4-15	Hartford
31	High Grade Potato Fertilizer	5-8-7	Wethersfield
34	Special Comp. Corn, Onion and Potash Fertilizer	3-8-2	South Manchester.
	Parmenter & Polsey Fertilizer Co., Boston, Mass.		
23466	4-8-4 for Potatoes, Corn and Vegetables	4-8-4	Wallingford
23481	5-8-7 for Potatoes and Market Gardens	5-8-7	New Britain
23465	"P & P" Plymouth Rock Brand for all Crops, 3-8-4	3-8-4	Plainville
	Frank S. Platt Co., New Haven.		
23462	Platco Special, 4-8-6	4-8-6	New Haven
	The Rogers & Hubbard Co., Portland.		
23434	R. & H. All Soils—All Crops Fertilizer	4-10-4	Somers
23034	Hubbard's Bone Base Fertilizer for Oats and Top Dressing	10-3-8	Branford
23036	Hubbard's Bone Base Fertilizer for Seeding Down	3-5-6	Portland
170	Hubbard's Bone Base Fertilizer for Seeding Down	3-5-6	Westville
23033	Hubbard's Bone Base Soluble Corn and General Crops Manure	3-8-6	Branford
23035	Hubbard's Bone Base Soluble Potato Manure	6-8-5	Branford
7	Hubbard's Bone Base Soluble Potato Manure	6-8-5	Naugatuck
23157	Hubbard's Bone Base Soluble Tobacco Manure	6-8-10	Glastonbury
23436	R. & H. Climax Tobacco Brand	5-4-4	Suffield
23433	R. & H. Corn and Grain Fertilizer	1-10-3	Norwich
23147	R. & H. Garden Fertilizer	2-10-4	Hartford
23425	R. & H. High Potash Fertilizer	3-8-10	Branford

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
0.93	0.01	0.10	1.83	2.87	**3.49**	0.58	7.35	**6.77**	6.40	**6.40**	**37**
1.40	0.13	0.33	2.51	4.37	**5.31**	0.50	4.70	**4.20**	1.67	**16.04**	**23195**
1.39	0.10	0.94	1.78	4.21	**5.12**	2.60	11.10	**8.50**	0.81	**7.15**	**31**
1.23	0.07	0.13	1.12	2.55	**3.10**	2.20	11.20	**9.00**	2.25	**2.25**	**34**
1.36	0.77	0.42	0.89	3.44	**4.18**	0.70	9.25	**8.55**	4.25	**4.25**	**23466**
1.34	1.01	0.55	1.13	4.03	**4.90**	1.13	9.23	**8.10**	6.72	**6.72**	**23481**
0.88	0.66	0.20	0.75	2.49	**3.03**	0.64	8.64	**8.00**	4.22	**4.22**	**23465**
1.02	0.90	0.50	0.91	3.33	**4.05**	0.68	9.48	**8.80**	6.23	**6.23**	**23462**
1.82	0.09	0.87	0.59	3.37	**4.10**	2.58	12.32	**9.74**	4.47	**4.47**	**23434**
7.55	0.05	0.69	0.27	8.56	**10.41**	2.95	8.53	**5.58**	4.94	**7.70**	**23034**
0.97	0.03	0.27	1.40	2.67	**3.25**	5.05	11.38	**6.33**	6.27	**6.27**	**23036**
....	....	....	....	2.53	**3.08**	4.48	11.77	**7.29**	....	**5.84**	**170**
1.17	0.07	0.33	0.96	2.53	**3.08**	2.80	11.05	**8.25**	6.05	**6.05**	**23033**
2.97	0.19	1.05	0.90	5.11	**6.21**	3.47	11.00	**7.53**	0.90	**5.06**	**23035**
....	....	....	....	5.03	**6.12**	3.28	10.80	**7.52**	....	**4.58**	**7**
2.10	0.15	1.94	0.84	5.03	**6.12**	3.24	10.78	**7.54**	1.20	**10.33**	**23157**
1.53	0.03	0.39	2.16	4.11	**5.00**	0.33	5.60	**5.27**	0.54	**4.69**	**23436**
0.10	0.07	0.48	0.54	1.19	**1.45**	2.71	12.46	**9.75**	3.17	**3.17**	**23433**
0.38	0.15	0.80	0.47	1.80	**2.19**	3.42	12.69	**9.27**	3.90	**3.90**	**23147**
1.06	0.07	0.75	0.63	2.51	**3.05**	3.06	10.64	**7.58**	9.65	**9.65**	**23425**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	The Rogers & Hubbard Co., Portland.—*Continued.*		
23148	R. & H. Potato Fertilizer	2-10-4	Branford
23449	R. & H. Richmond's Special Tobacco Formula	5-4-5	New Milford
22964	R. & H. Tobacco Grower, Vegetable Formula	6-4-4	Hartford
22965	R. & H. Tobacco Grower, Vegetable Formula	6-4-4	Hartford
23156	4-8-4 Fertilizer	4-8-4	Guilford
	F. S. Royster Guano Co., Baltimore, Md.		
23443	Royster's Bully Guano	2-8-5	Plainville
23459	Royster's Quality Trucker	4-8-7	Plainville
23453	Royster's Spearhead Guano	3-8-4	Thompsonville
23060	Royster's Top Dresser	7-6-5	Plainville
23444	Royster's Truckers Delight	4-8-4	Milford
23467	Royster's Valley Tobacco Formula	5-4-5	East Windsor Hill
670	Royster's Valley Tobacco Formula	5-4-5	Granby
23468	Royster's Wrapper Brand	7-3-7	Granby
	Sanderson Fertilizer & Chemical Co., New Haven.		
22993	Atlantic Coast Bone, Fish and Potash	2-8-3	Windsor Locks
23063	Complete Tobacco Grower	5-4-5	Windsor Locks
23451	Corn Superphosphate	2-8-2	Hamden
22865	Formula A	4-8-4	Milford
23069	Formula B	4-8-6	Glastonbury
23447	Kelsey's Bone Fish and Potash	3-10-3	Cromwell
23450	Potato Manure	3-8-4	Hamden
22989	Top Dressing for Grass and Grain	6-6-4	New Haven
	M. L. Shoemaker & Co., Philadelphia, Pa.		
23463	Swift-Sure 4-8-5 Potato No. 1	4-8-5	New Milford
23460	Swift-Sure Tobacco and General Use 3-10-3	3-10-3	Thompsonville
23464	Swift-Sure Tobacco Special	5-4-5	New Milford

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.					Ammonia equivalent to total n	Phosphoric Acid.			Potash.		Station No.
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	
%	%	%	%	%	%	%	%	%	%	%	
0.34	0.15	0.75	0.50	1.74	**2.11**	2.90	12.81	**9.91**	3.95	**3.95**	23148
1.23	0.03	0.28	2.39	3.93	**4.77**	0.20	4.95	**4.75**	0.37	**5.06**	23449
1.19	0.10	0.35	3.32	4.96	**6.03**	0.61	5.59	**4.98**	0.51	**4.58**	22964
....	....	....	....	4.96	**6.03**	0.55	5.50	**4.95**	0.52	**4.42**	22965
1.92	0.03	0.57	0.78	3.30	**4.01**	2.53	10.54	**8.01**	4.07	**4.07**	23156
0.00	1.10	0.04	0.58	1.72	**2.09**	0.95	9.20	**8.25**	4.87	**4.87**	23443
0.01	2.16	0.18	0.87	3.22	**3.91**	1.23	9.26	**8.03**	6.96	**6.96**	23459
0.00	1.73	0.23	0.69	2.65	**3.22**	1.05	9.38	**8.33**	4.69	**4.69**	23453
0.78	2.37	0.52	1.37	5.04	**6.13**	0.78	7.45	**6.67**	4.97	**4.97**	23060
0.00	2.23	0.41	0.68	3.32	**4.03**	0.58	8.70	**8.12**	3.98	**3.98**	23444
0.42	0.78	0.13	2.52	3.85	**4.68**	0.30	4.75	**4.45**	0.36	**4.93**	23467
....	....	....	....	3.93	**4.78**	0.48	4.93	**4.45**	....	**5.28**	670
0.52	1.29	0.45	2.97	5.23	**6.36**	0.30	3.83	**3.53**	0.77	**7.08**	23468
0.02	0.49	0.43	0.71	1.65	**2.01**	0.90	9.05	**8.15**	3.00	**3.11**	22993
0.92	0.01	0.13	2.94	4.00	**4.86**	0.18	4.28	**4.10**	0.58	**5.98**	23063
0.00	0.42	0.73	0.55	1.70	**2.07**	0.72	8.75	**8.03**	2.22	**2.22**	23451
0.76	1.24	0.66	0.52	3.18	**3.87**	1.11	9.15	**8.04**	4.17	**4.17**	22865
0.77	0.96	0.24	1.58	3.55	**4.32**	0.83	9.03	**8.20**	0.77	**6.28**	23069
0.44	0.71	0.73	0.59	2.47	**3.00**	0.65	10.43	**9.78**	3.22	**3.22**	23447
0.44	0.73	0.83	0.46	2.46	**2.99**	0.50	8.80	**8.30**	4.08	**4.08**	23450
2.77	1.25	0.54	0.53	5.09	**6.19**	0.40	6.59	**6.19**	4.01	**4.19**	22989
0.83	0.07	0.62	1.72	3.24	**3.94**	3.15	12.60	**9.45**	1.58	**5.44**	23463
0.89	0.06	0.47	1.21	2.63	**3.20**	2.78	14.28	**11.50**	0.36	**3.08**	23460
0.93	0.00	0.47	2.75	4.15	**5.05**	1.75	8.25	**6.50**	0.86	**7.98**	23464

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Springfield Rendering Co., Springfield, Mass.		
23446	Animal Brand 3-8-4	3-8-4	Thompsonville
23445	Market Garden Grower and Top Dresser 5-8-7	5-8-7	Hazardville
23452	Special Potato, Onion and Vegetable 4-8-4	4-8-4	Stafford Springs
23454	Tobacco Special 5-4-5	5-4-5	Thompsonville
	Standard Agricultural Chemical Corp., New York.		
136	Prepared Alphano Humus	1.5	Hartford
127	Super-Alphano	5-7-4	New Haven
	Virginia-Carolina Chemical Co., New York.		
30	Aroostook Potato Grower	5-8-7	Guilford
90	Champion Brand	4-8-4	"
23189	Double Owl Brand	4-8-6	"
93	Fish, Phosphate and Potash Brand	2-8-2	Rockville
94	Indian Chief Brand	5-4-5	Hazardville
23193	Perfection Brand	3-9-5	North Haven
92	Tip-Top Brand	8-6-6	North Haven
666	Tip-Top Brand	8-6-6	New Britain
	Wilcox Fertilizer Co., Mystic.		
132	4-8-4, Fertilizer	4-8-4	Montville
133	5-8-7, Fertilizer	5-8-7	Woodstock
374	5-10-5, Mixture	5-10-5	Ellington
131	Corn Special	3-10-4	Montville
23296	Fish and Potash	3-8-3	Mystic
128	Potato and Vegetable Phosphate	4-8-6	Ellington
23292	Tobacco Special	5-4-5	Ellington
	S. D. Woodruff & Sons, Orange.		
23188	Home Mixed Fertilizer	4-8-6	Orange
	Worcester Rendering Co., Auburn, Mass.		
23475	Prosperity Corn and Grain 2-8-2	2-8-2	Putnam
23476	Prosperity Market Garden 5-8-7	5-8-7	Putnam
23473	Prosperity Potato and Vegetable Fertilizer, 4-8-4	4-8-4	Norwich

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
0.36	0.54	0.88	0.74	2.52	**3.06**	0.70	9.25	**8.55**	4.14	**4.14**	**23446**
1.16	0.63	1.18	0.93	3.90	**4.74**	0.83	9.55	**8.72**	7.44	**7.44**	**23445**
1.41	0.00	0.91	0.74	3.06	**3.72**	0.65	9.03	**8.38**	4.18	**4.18**	**23452**
1.77	0.00	0.55	1.84	4.16	**5.06**	0.78	6.23	**5.45**	0.52	**5.43**	**23454**
....	....	....	....	1.55	**1 88**	....	0.60	....	....	**0.29**	**136**
1.11	1.52	0.00	1.80	4.43	**5.39**	0.38	7.52	**7.14**	0.60	**4.17**	**127**
0.04	3.17	0.61	0.23	4.05	**4.92**	0.95	8.83	**7.88**	7.13	**7.13**	**30**
0.00	2.48	0.46	0.28	3.22	**3.91**	0.93	9.08	**8.15**	3.75	**3.75**	**90**
0.05	2.59	0.41	0.25	3.30	**4.01**	1.18	8.93	**7.75**	6.38	**6.38**	**23189**
0.13	0.86	0.27	0.40	1.66	**2.02**	1.13	9.28	**8.15**	1.76	**1.76**	**93**
0.36	0.54	0.39	3.09	4.38	**5.33**	0.45	4.82	**4.37**	0.44	**4.53**	**94**
0.00	1.91	0.50	0.19	2.60	**3.16**	1.65	10.23	**8.58**	5.08	**5.59**	**23193**
2.83	2.57	0.57	0.19	6.16	**7.49**	1.00	6.95	**5.95**	3.44	**4.83**	**92**
....	....	....	....	6.38	**7.76**	1.09	7.13	**6.04**	....	**5.55**	**666**
1.70	0.17	0.83	0.80	3.50	**4.26**	0.95	9.53	**8.58**	4.16	**4.16**	**132**
1.79	0.14	0.74	1.30	3.97	**4.83**	2.48	10.85	**8.37**	3.93	**6.74**	**133**
1.84	0.15	0.85	1.23	4.07	**4.95**	1.70	11.55	**9.85**	4.47	**5.23**	**374**
0.87	0.12	0.60	0.80	2.39	**2.91**	0.78	11.25	**10.47**	4.02	**4.02**	**131**
1.07	0.18	0.64	0.77	2.66	**3.23**	0.83	12.10	**11.27**	3.36	**3.36**	**23296**
1.58	0.09	0.48	1.09	3.24	**3.94**	1.40	9.85	**8.45**	2.99	**6.19**	**128**
0.00	0.26	1.51	4.14	5.91	**7.19**	0.28	5.68	**5.40**	0.73	**5.85**	**23292**
1.78	0.00	0.20	1.21	3.19	**3.88**	1.00	7.97	**6.97**	10.76	**10.76**	**23188**
1.04	0.09	0.20	0.43	1.76	**2.14**	0.70	9.05	**8.35**	2.31	**2.31**	**23475**
1.17	0.97	0.83	1.11	4.08	**4.96**	0.79	8.68	**7.89**	7.12	**7.12**	**23476**
0.70	0.77	0.70	1.15	3.32	**4.04**	0.65	8.75	**8.10**	4.00	**4.00**	**23473**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Purchaser:		
	American Agricultural Chemical Co., New York.		
75	National Complete Tobacco Fertilizer	5-4-5	Thompsonville
	Armour Fertilizer Works, New York.		
22610	Armour's, 4-8-4	4-8-4	Preston City
22611	Armour's, 5-8-7	5-8-7	Preston City
	The Berkshire Fertilizer Co., Bridgeport.		
22814	Berkshire Tobacco Special	7-3-5	Windsor Locks
22909	Berkshire Tobacco Special	7-3-5	East Windsor Hill
	Bowker Fertilizer Co., New York.		
342	Bowker's Fertilizer, 5-4-5	5-4-5	Suffield
	The E. D. Chittenden Co., Bridgeport.		
23178	Chittenden's Tobacco Special, 5-4-5	5-4-5	Silver Lane
	L. T. Frisbie Co., New Haven.		
23080	Frisbie's, 5-8-7	5-8-7	Manchester
23144	Frisbie's, 5-8-7	5-8-7	Norwich
23143	Frisbie's Special Vegetable and Potato Grower, 4-8-4	4-8-4	Norwich
	International Agricultural Corp., Boston, Mass.		
23387	Tobacco Fertilizer, 7-6-7	7-6-7	Suffield
	New Jersey Fertilizer & Chemical Co., New York.		
22970	"Croxton Big Crop"	5-8-6	New Preston
	Olds & Whipple, Inc., Hartford.		
23076	High Grade Potato Fertilizer, 5-8-7	5-8-7	Windsor Locks

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Continued.*

Nitrogen.					Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	
%	%	%	%	%	%	%	%	%	%	%	
....	....	....	....	4.50	**5.47**	0.38	4.65	**4.27**	0.44	**5.24**	**75**
....	....	....	....	3.48	**4.23**	....	....	....	....	....	**22610**
....	....	....	....	2.89	**3.51**	....	....	....	....	....	**22611**
....	....	....	....	5.82	**7.08**	0.26	4.81	**4.55**	....	**5.90**	**22814**
....	....	....	....	6.02	**7.32**	....	4.11	....	....	**6.06**	**22909**
....	....	....	....	3.92	**4.77**	....	4.68	....	....	4.96	**342**
....	....	....	....	3.72	**4.52**	0.38	5.63	**5.25**	1.33	**6.09**	**23178**
....	....	....	....	4.04	**4.91**	0.75	9.28	**8.53**	6.94	**6.94**	**23080**
....	....	....	....	4.03	**4.90**	0.73	9.73	**9.00**	7.22	**7.22**	**23144**
....	....	....	....	3.08	**3.74**	0.68	9.15	**8.47**	4.26	**4.26**	**23143**
0.12	2.21	....	....	5.70	**6.93**	0.35	6.35	**6.00**	0.47	**7.36**	**23387**
....	....	....	....	4.19	**5.09**	0.83	9.67	**8.84**	6.22	**6.22**	**22970**
....	....	....	....	4.42	**5.37**	1.57	9.23	**7.66**	0.97	**9.16**	**23076**

TABLE XIV. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade	Place of Sampling.
	Sampled by Purchaser:		
	The Rogers & Hubbard Co., Portland.		
22785	R. & H. Tobacco Grower, Vegetable Formula.....	6-4-4	Burnside.....
	F. S. Royster Guano Co., Baltimore, Md.		
140	Royster's Fertilizer, Sample A..	7-3-7	Rockville.....
141	Royster's Fertilizer, Sample B..	7-3-7	Rockville.....
	The Worcester Rendering Co., Auburn, Mass.		
1	6-6-3, Fertilizer.....	6-6-3	Manufacturer's Sample.....

CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH—*Concluded.*

Nitrogen.						Phosphoric Acid.			Potash.		
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.	Ammonia equivalent to total nitrogen.	Citrate-insoluble.	Total.	So-called "Available."	As muriate.	Total.	Station No.
%	%	%	%	%	%	%	%	%	%	%	
....	....	....	....	4.99	**6.07**	0.70	5.19	**4.49**	....	**4.42**	**22785**
....	....	....	....	5.84	**7.10**	....	4.30	....	....	**6.06**	**140**
....	....	....	....	4.48	**5.45**	....	6.70	....	....	**6.57**	**141**
0.48	1.83	0.81	1.37	4.49	**5.46**	0.83	6.70	**5.87**	3.31	**3.31**	**1**

SPECIAL MIXTURES AND HOME MIXTURES.

Twenty-eight samples of home-mixed goods or fertilizers mixed by manufacturers according to formulas furnished by purchasers, have been analyzed and are reported in Table XVII. Eleven were sampled by the Station and the remainder were submitted by purchasers.

TABLE XVII. ANALYSES OF SPECIAL MIXTURES

Station No.	Manufacturer.	Place of Sampling.
	Sampled by Station:	
195	American Agricultural Chemical Co., New York	Arthur Manning, So. Manchester
188	Apothecaries Hall Co., Waterbury	A. F. Newmarker, Rockville
194	Apothecaries Hall Co., Waterbury	Arthur Manning, So. Manchester
193	Berkshire Fertilizer Co., Bridgeport	" "
196	Berkshire Fertilizer Co., Bridgeport	" "
23386	L. T. Frisbie, New Haven	L. P. Hickey, East Hartford
192	Olds & Whipple, Inc., Hartford	Arthur Manning, So. Manchester
22867		T. W. Ryan, Stratford
22868		T. W. Ryan, Stratford
187		Geo. Webster, Rockville
	Sampled by Purchaser:	
22442		American Sumatra Tobacco Co., Bloomfield
22443		" "
22608		" "
22444		" "
22590		" "
22467		" "
22609		" "
22489		" "
23388	Apothecaries Hall Co., Waterbury	W. J. Burgess, Thompsonville
23348	Berkshire Fertilizer Co., Bridgeport	H. Rashall, Ellington
23176	L. T. Frisbie Co., New Haven	W. T. Clark, Norwich
23074	Olds & Whipple, Inc., Hartford	H. E. Wells, Windsor Locks
23075	" "	H. E. Wells, Windsor Locks
22948	" "	G. Stephen Potwine, Warehouse Point
23029	" "	G. Stephen Potwine, Warehouse Point
23308	" "	H. Whitaker, Hazardville
23309	" "	H. Whitaker, Hazardville
23177		Aleck Sullivan, East Windsor Hill

AND HOME MIXTURES.

Nitrogen.					Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
In nitrates.	In ammonia.	Organic, water-soluble.	Organic, water-insoluble.	Total.		Citrate-insoluble.	Total.	So-called "Available"	As muriate.	Total.	
%	%	%	%	%	%	%	%	%	%	%	
....	....	....	....	5.64	**6.86**	1.18	6.00	**4.82**	0.41	**5.31**	**195**
....	....	....	....	5.35	**6.50**	2.18	8.10	**5.92**	0.78	**8.24**	**188**
....	....	....	....	6.11	**7.43**	0.98	6.15	**5.17**	0.65	**6.24**	**194**
....	....	....	....	7.91	**9.62**	0.80	2.88	**2.08**	....	....	**193**
....	....	....	....	5.69	**6.92**	1.55	6.23	**4.68**	0.64	**5.91**	**196**
....	....	....	....	5.35	**6.50**	0.38	8.53	**8.15**	0.89	**8.70**	**23386**
....	....	....	....	6.12	**7.44**	1.08	6.38	**5.30**	0.36	**6.30**	**192**
....	....	....	....	3.92	**4.77**	1.43	11.37	**9.94**	....	**7.36**	**22867**
....	....	....	....	4.70	**5.71**	0.56	8.20	**7.64**	5.87	**6.12**	**22868**
....	....	....	....	4.76	**5.79**	0.93	9.28	**8.35**	....	**4.64**	**187**
....	....	....	....	5.38	**6.54**	....	5.82	....	0.16	**5.93**	**22442**
....	....	....	....	6.02	**7.32**	....	4.87	....	0.16	**6.04**	**22443**
....	....	....	....	5.64	**6.86**	....	6.83	....	0.31	**7.77**	**22608**
....	....	....	....	6.14	**7.47**	....	5.55	....	trace	**7.54**	**22444**
....	....	....	....	5.53	**6.72**	....	4.64	....	0.29	**8.58**	**22590**
....	....	....	....	5.08	**6.18**	....	4.96	....	0.16	**9.44**	**22467**
....	....	....	....	5.92	**7.20**	....	5.36	....	0.35	**7.74**	**22609**
....	....	....	....	5.21	**6.33**	....	5.39	....	0.15	**8.92**	**22489**
0.08	0.13	....	....	5.59	**6.80**	0.30	6.00	**5.70**	0.57	**9.13**	**23388**
....	....	....	....	6.68	**8.12**	....	3.75	....	0.81	**7.88**	**23348**
....	....	....	....	4.93	**5.99**	0.45	9.88	**9.43**	6.09	**6.09**	**23176**
....	....	....	....	5.92	**7.20**	1.10	6.10	**5.00**	1.44	**11.72**	**23074**
....	....	....	....	5.67	**6.89**	1.06	6.28	**5.22**	1.54	**11.39**	**23075**
....	....	....	....	3.67	**4.46**	....	5.78	....	0.98	**14.03**	**22948**
....	....	....	....	2.95	**3.59**	2.33	14.24	**11.91**	4.99	**4.99**	**23029**
....	....	....	....	5.78	**7.03**	0.28	5.80	**5.52**	0.51	**6.66**	**23308**
....	....	....	....	5.60	**6.81**	0.30	6.00	**5.70**	0.52	**6.73**	**23309**
....	....	....	....	6.16	**7.49**	0.43	3.85	**3.42**	0.76	**5.87**	**23177**

VII. MISCELLANEOUS FERTILIZERS, AMENDMENTS AND WASTE PRODUCTS.

WOOD ASHES.

Twenty samples have been examined. No. **22959** was wet and low in potash. No. **23302** was also low grade. The other samples submitted contained from 4.80 to 7.83 per cent of potash and were of good quality. Wood ashes contain from 1 to 2.5 per cent of phosphoric acid and 30 per cent or more of lime, but they are an expensive source of potash. The prevailing price quoted is $5.00 per unit, which is about five times the cost of other equally available forms of potash.

Analyses are given in Table XVIII.

SHEEP MANURE, ETC.

Fourteen samples of this class of materials have been analyzed, ten of which were sampled by the Station agent. Analyses are given in Table XIX.

Ton prices have ranged from $30.00 to $50.00, the avcrage being about $45 00.

TABLE XVIII. ANALYSES OF WOOD ASHES, ETC.

Station No.	Manufacturer.	Purchaser.	Phosphoric acid.	Water-soluble potash.	Insoluble material.
	Sampled by Station:		%	%	%
22959	John Joynt, Lucknow, Canada	J. E. Lathrop, Burnside.	1.22	2.47	.....
	Sampled by Purchaser:				
23023	John Joynt, Lucknow, Canada	Hatheway & Steane, Hartford.....	2.03	7.49	12.17
23024	" "	" "	1.90	5.70	24.20
23025	" "	" "	2.33	7.08	14.56
23026	" "	" "	2.28	6.01	14.25
23027	" "	" "	2.40	5.07	16.22
23202	" "	" "	2.25	5.88	11.38
23203	" "	" "	1.80	7.63	6.83
23255	" "	" "	2.10	5.99	13.78
23256	" "	" "	2.95	7.83	11.40
23257	" "	" "	2.08	6.01	10.63
23258	" "	" "	2.08	4.98	18.75
23200	" "	Hunting Bros., East Hartford.....	2.10	6.86	7.65
23201	" "	Hunting Bros., East Hartford.....	1.88	6.27	10.43
23283	" "	Henry Sachs, Collinsville	2.18	6.82	8.00
22914	" "	Steane, Hartman & Co., Inc., Hartford.....	1.93	6.48	8.71
22944	" "	Steane, Hartman & Co., Inc., Hartford.....	1.47	4.80	7.50
23221	Lucian North, Avon, Conn...	S. W. Eddy, Avon.....	1.53	7.27	5.08
23028	.....	Sperry & Barnes, New Haven.....	2.08	6.18	4.33
23302	.....	A. S. Pons, Bristol.....	1.45	3.19	12.75

TABLE XIX. ANALYSES OF

Station No.	Manufacturer or Brand.	Purchased, Sampled or Sent By.
23260	American Agricultural Chemical Co., New York City	Station Agent from Geo. S. Phelps & Co., Thompsonville
23008	Armour Fertilizer Works, New York	Station Agent from Collins & Freeman, Branford
23393	Berkshire Fertilizer Co., Bridgeport	Station Agent from C. Buckingham & Co., Southport
22982	*Sheep's Head.* Natural Guano Co., Aurora, Illinois	Station Agent from Cadwell & Jones, Hartford
22991	*Groz-It.* Pacific Manure & Fertilizer Co., San Francisco, Cal.	Station Agent from Meech & Stoddard, Middletown
23457	*Premier.* Premier Poultry Manure Co., Chicago, Illinois	Station Agent from Lightbourn & Pond, New Haven
23458	*Premier.* Premier Poultry Manure Co., Chicago, Illinois	Station Agent from Lightbourn & Pond, New Haven
22983	*Wizard.* The Pulverized Manure Co., Chicago, Illinois	Station Agent from F. S. Bidwell & Co., Windsor Locks
23043	*Wizard.* The Pulverized Manure Co., Chicago, Illinois	Station Agent from F. C. Benjamin, Danbury
22986	*So. American Sheep and Goat Manure.* Sanderson Fertilizer & Chemical Co., New Haven	Station Agent from Factory
180	*Groz-It.* Pacific Manure & Fertilizer Co., San Francisco, Cal.	C. L. Bardo, New Haven
181	*South American Sheep and Goat Manure.* Sanderson Fertilizer & Chemical Co., New Haven	C. L. Bardo, New Haven
22811	[1] Pigeon Manure (kept under cover)	Karl Jursek, Mt. Carmel
22812	[2] Pigeon Manure (exposed to weather)	Karl Jursek, Mt. Carmel

[1] Water 42.36%
[2] Water 59.35%

SHEEP MANURE, ETC.

Total nitrogen.	Ammonia equivalent to total nitrogen.		Phosphoric Acid.				Potash.		Station No.
			Available.		Total.				
	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.	
%	%	%	%	%	%	%	%	%	
2.12	2.58	1.75	....	....	1.30	0.75	2.07	2.00	**23260**
1.31	1.59	1.50	....	....	0.98	1.00	3.04	2.00	**23008**
2.34	2.84	2.18	....	....	1.28	1.00	2.14	2.00	**23393**
2.47	3.00	2.73	1.66	1.00	1.75	1.25	2.07	2.00	**22982**
1.33	1.62	1.80	....	....	0.81	1.25	2.76	3.00	**22991**
1.81	2.20	2.25	0.80	1.00	0.88	1.25	2.57	2.00	**23457**
5.25	6.38	5.00	3.10	1.70	3.28	2.70	1.44	1.30	**23458**
2.07	2.52	2.43	1.36	1.25	1.45	....	2.04	2.00	**22983**
2.01	2.44	2.10	1.05	1.00	1.43	....	1.56	1.00	**23043**
1.30	1.58	1.50	....	....	0.95	1.00	2.70	2.50	**22986**
1.25	1.52	....	....	....	0.90	....	2.94	....	**180**
1.49	1.81	....	....	....	1.00	....	2.87	....	**181**
3.80	4.62	....	....	....	1.76	....	1.39	....	**22811**
0.93	1.13	....	....	....	1.19	....	0.77	....	**22812**

SEWAGE SLUDGE.

142. *Sludge* from Sewage Disposal Plant, Stamford.
Analysis:

Water 17.34 per cent, ash 38.95 per cent, organic and volatile matter 43.71 per cent, nitrogen 2.27 per cent.

21860. *Activated sludge.* Sanitary District of Chicago.
Manufacturer's sample. This is the product obtained in the process of purifying sewage by aeration methods.
Analysis:

Nitrogen in ammonia 0.06 per cent, organic nitrogen 5.42 per cent, total nitrogen 5.48 per cent, active insoluble organic nitrogen 2.93 per cent, inactive insoluble organic nitrogen 1.79 per cent, available phosphoric acid 3.00 per cent, total phosphoric acid 3.91, total potash 0.79 per cent.

The activity of the insoluble organic nitrogen is about 62 per cent by the method employed (alkaline permanganate).

LIME.

The application of lime for purposes of soil improvement has been practiced since very remote times. Marl and ash were used for this by the ancient Greeks and Romans and in early English history the practice of spreading chalk on the land is recorded. The early colonists in America brought the practice with them, and marl, ashes, and gypsum or land plaster are conspicuous in the records of colonial agriculture. With the advent of artificial fertilizers the use of liming materials was largely suspended but modern agricultural practice has restored lime to wider recognition than ever before.

In the earlier sense of the term "lime", a miscellaneous group of calcium-containing materials were included such as marls, chalk, oyster and clam shells, limestone, marble, and the ashes of wood and other organic substances in which calcium is combined wholly or in part as carbonate; gypsum or land plaster which is calcium sulphate; and phosphate of lime which is derived from phosphatic rocks and from bone. The current usage of the term, however, is more restricted and applies chiefly to calcitic and dolomitic limestones, oyster shell lime, calcareous marls and the several forms of lime derived from them.

The practical use of lime in New England may be discussed very briefly as follows:

1. The chief function of lime is to make the soil less "acid". The exact nature of this "acidity" is a matter on which scientists are not entirely agreed, but all agree that lime will change the reaction.

2. The soils of Connecticut are usually acid, due to lime deficiency of the rock from which they are derived, the relatively high leachiness of our soils, and the long period of time which

most of the tillable area has been under cultivation. Also, due to the variable factors of original soil material, leachiness and past agricultural practice, our soils vary widely in the degree of acidity.

3. We are not so much concerned with soil acidity as such, as with the success of a large number of crops such as clover, alfalfa, timothy, redtop, tobacco, potatoes, tomatoes, lettuce, beets, carrots, spinach and many others. It has also been shown, particularly by the Rhode Island Station, that crops vary greatly in their sensitiveness to acidity and in their response to applications of lime. For instance, red top, strawberries and watermelons do very well under acid conditions while others, like beets, onions and alfalfa, require a condition much less acid. Certain diseases, like potato scab and tobacco root-rot, are controlled by keeping the soil moderately acid.

4. A knowledge of the intensity of soil acidity is manifestly of great importance as a guide to farm practice in regard to any given crop to be grown. The "litmus paper" test was formerly used in this connection, but it is not sufficiently sensitive to show the finer distinctions in soil reaction that modern research has shown to be necessary, and there are much better methods, which, while far more perfect, do give a fairly accurate estimate of the degree and intensity of the acidity.

5. Our liming practice should therefore be based on the following information:

a– What crops are to be grown?
b– What amounts of stable manure are used?
c– What kinds and amounts of fertilizer are used?
d– When, in what form and what amounts has lime been used?
e– What is the reaction of the soil?

This last can be learned by sending representative samples from various fields to the Experiment Station. Such samples should be accompanied by the information indicated in a, b, c and d above, if advice is desired relative to the use of lime.

The inference should not be drawn that we now have accurate information on all the problems concerned with "acidity," but progress is being made and on certain crops there is quite accurate information.

The relation between actual lime (calcium oxide, CaO), and the several natural and manufactured lime products is illustrated as follows: If 100 lbs. of pure crushed limestone are burned in a kiln at suitable temperature (650-900 °C. or 1200-1650 °F.), 56 pounds of actual lime (calcium oxide, CaO), are obtained, the remaining 44 pounds being lost in the form of carbon dioxide gas (CO_2). This actual lime is known also by other names such as "stone lime" or "quicklime". Actual lime or quicklime is very

irritating to handle and in practice slaked lime is more often used. This is obtained by treating quicklime with water, with which it combines vigorously with the production of considerable heat. There is enough moisture in the air to accomplish the slaking process, but a longer time is required. The 56 lbs. of actual lime obtained from the original 100 lbs. of limestone will obviously increase in weight as it combines with water and will weigh 74 lbs. when completely slaked. This slaked lime is otherwise known as hydrated lime, calcium hydrate or calcium hydroxide. When quicklime is allowed to air-slake, however, it absorbs carbonic acid as well as moisture from the air so that the product is a mixture containing some quicklime, hydrated lime and carbonate of lime, or, in other terms, calcium oxide, calcium hydrate and calcium carbonate.

The changes described take place also in the case of limestones which contain magnesium (dolomitic limestones), the product of burning being in such cases the mixed oxides of lime and magnesia.

Commercial liming materials are judged on the basis of actual lime and magnesia (oxides of calcium and magnesium), which they contain, and upon their degree of fineness. The various products are quite variable in composition but in general they will contain mixed oxides about as follows:

Material	Oxides of calcium and magnesium ($CaO + MgO$)
	%
Carbonates:	
Limestone	45–55
Oyster shell	40–50
Marl	40–50
Burned Lime:	
Hydrated lime, high grade, less than 10% carbonates	65–75
Low grade, mixture of hydrate and carbonate	55–65
Lime ashes	50–60

The effectiveness of lime in the soil will depend directly upon its degree of fineness. Neither the carbonates nor hydrated limes are readily soluble in soil water and the rate at which they will be dissolved will depend upon the size of the particles. The smaller the grains the greater the relative amount of surface exposed to the action of the solvent.

Fineness of Lime.

Since there is a direct relationship between the fineness of lime products and their rate of availability in the soil, it might appear that the greatest degree of fineness is desirable. Yet because of the cost of grinding the lime to a very fine condition and the rapidity with which such material disappears in the soil, a medium ground lime seems to be the more desirable commercial product. A reliable authority assumes that pulverized limestone, all of which will pass a 10 mesh sieve, 70% of which will pass a 50 mesh

sieve, and 50% of which will pass a 100 mesh sieve, should give excellent results and yet be cheap enough to make its use worth while. In Ohio the standard required by law for agricultural ground limestone is that 95% of the material shall pass a 10 mesh screen, 50% shall pass a 50 mesh screen, and 30% shall pass a 100 mesh screen.

If immediate effects are desired in the use of moderate quantities of lime for a special crop of high money value, extreme fineness may be desirable, regardless of the greatly increased cost. This is usually obtained in hydrated limes.

In table XX are given analyses of 46 samples of lime. Some of these were collected and examined two years ago but the results have not been published.

Comments on Analyses.

22349. This was a sample of limestone dust which accumulated in the manufacture of poultry grit and was not offered for sale as an agricultural lime.

23030, 23031, 23254. The first two samples were submitted by purchasers. The manufacturer advised that the analysis of **23030** was quite unlike the composition of their product as shown by frequent check analyses of their own. Accordingly an official sample, **23254,** was drawn which was supposed to be the same material as **23030** but was sampled from different stock. This showed a composition substantially in accord with the manufacturer's claim and in agreement also with purchaser's sample **23031.** Evidently **23030** had become mixed with some material containing a relatively large amount of insoluble matter.

The cost of lime, so far as ton prices have been quoted to us, show considerable variation. Thus, four quotations for limestone have varied from $6.75 to $10.00 per ton. For hydrated lime, containing from 62 to 77 per cent of effective oxides, prices have ranged from $9.50 to $15.00.

TABLE XX. ANALYSES OF

Station No.	Manufacturer or Brand.	Place of Sampling.
	Ground Limestone.	
	Manufacturer Unknown.	
23482	Berkshire Ground Limestone	Southport
	C. W. Coe & Sons, Northford.	
23494	Ground Limestone	Factory
	Kapailo Mfg. Co., Inc., New York.	
22349	Limestone Dust	New Haven
	Grangers Mfg. Co., West Stockbridge, Mass.	
19944*	Grangers Agricultural Limestone	Hazardville
19945*	" "	Suffield
19946*	" "	Waterbury
23030†	" "	Hartford
23031†	" "	Avon
23254	Grangers Limestone	Windsor
334	Grangers Limestone	Rockville
	Clifford L. Miller, West Stockbridge, Mass.	
23491	Monarch Brand	Bridgeport
	The Stearns Lime Co., Danbury.	
18529*	Ground Limestone	Danbury
18561*	" "	Roxbury
19941*	" "	Branford
	White Marble Products Co., Ashley Falls.	
18530*	Ground Limestone	Ashley Falls, Mass.
18560*	Ground Limestone	Roxbury
	Hydrated Lime.	
	Cheshire Lime Mfg. Co., Cheshire, Mass.	
20013*	Agricultural Lime	Hartford
	Conn. Lime Co., Canaan.	
19943*	Agricultural Lime	Hartford
19948*	Dry Hydrated Lime	Litchfield
19949*	Air Slacked Lime (waste)	Canaan
20014*	Canaan Agricultural Lime	Canaan
20017*	Lee Hydrate, Conn. Brand	East Canaan
20018*	Air Slacked Lime (waste)	Canaan
23485	Agricultural Lime	Hartford
23486	Burned Lime Screenings	Ellington
	Hoosac Valley Lime Co., Adams, Mass.	
23077†	Agricultural Lime	Warehouse Point

* Analyzed in 1922.
† Sampled by Purchaser.

LIMESTONE, ETC.

Chemical Analysis.							Mechanical Analysis.					
Lime (CaO).		Magnesia (MgO).										
Found.	Guaranteed.	Found.	Guaranteed.	Total oxides.	Insoluble in acid.	Carbon dioxide.	20 mesh.	40 mesh.	50 mesh.	80 mesh.	100 mesh.	Station No.
%	%	%	%	%	%	%	%	%	%	%	%	
41.95	.....	9.17	.....	51.12	6.13	28.18	95.00	85.50	76.50	67.00	63.50	**23482**
52.91	.....	0.70	.....	53.61	3.21	.....	78.50	61.00	52.50	45.00	43.00	**23494**
30.74	.....	21.09	....	51.83	1.85	.....	.....	100.00	87.00	59.00	50.00	**22349**
36.80	35.00	9.84	1.00	46.64	13.84	.....	.....	.....	82.00	....	53.50	**19944**
35.72	35.00	9.78	1.00	45.50	16.22	.....	.....	.....	77.50	....	59.50	**19945**
43.46	35.00	6.88	1.00	50.34	8.80	.....	.....	.....	67.00	....	42.00	**19946**
39.96	.....	0.65	.....	40.61	28.83	.....	100.00	100.00	99.50	94.50	89.50	**23030**
51.82	.....	0.97	.....	52.79	6.85	.....	100.00	100.00	99.00	92.00	87.00	**23031**
50.68	.....	1.26	.....	51.94	8.70	.....	100.00	100.00	99.50	93.00	89.00	**23254**
51.85	.....	0.58	.....	52.43	6.37	41.22	.....	.....	.....	....	.....	**334**
43.27	36.87	8.42	13.72	51.69	5.63	39.46	98.00	87.00	77.00	66.00	62.50	**23491**
41.80	.....	4.87	.....	46.67	.....	.....	.....	.....	88.80	.....	76.30	**18529**
43.17	.....	.....	.....	.....	13.27	.....	.....	.....	.....	.....	.....	**18561**
46.06	43.00	4.44	2.00	50.50	9.45	.....	.....	.....	85.50	.....	65.00	**19941**
29.98	.....	20.62	.....	50.60	.....	.....	.....	.....	77.40	.....	48.80	**18530**
30.74	.....	.....	.....	.....	1.60	.....	.....	.....	.....	.....	.....	**18560**
61.28	58.00	2.48	0.60	63.76	1.36	.....	.....	.....	.....	.....	.....	**20013**
47.38	.....	31.37	27.00	78.75	1.78	4.41	.....	.....	.....	.....	.....	**19943**
48.36	.....	30.46	.....	78.82	1.89	6.11	.....	.....	.....	.....	.....	**19948**
30.51	.....	20.67	.....	51.18	1.48	10.21	.....	.....	.....	.....	.....	**19949**
44.14	52.00	29.25	23.00	73.39	1.00	3.90	.....	.....	.....	.....	.....	**20014**
46.98	.....	32.08	.....	79.06	1.48	1.98	.....	.....	.....	.....	.....	**20017**
39.80	.....	27.80	.....	67.60	1.23	.....	.....	.....	.....	.....	.....	**20018**
51.62	.....	12.51	.....	64.13	1.33	15.47	91.00	72.00	58.50	47.50	44.50	**23485**
41.44	.....	27.23	.....	68.67	1.00	4.32	73.00	43.50	34.00	28.50	27.50	**23486**
60.58	58.00	0.69	0.50	61.27	3.38	.....	75.50	52.50	39.50	29.00	26.00	**23077**

TABLE XX. ANALYSES OF

Station No.	Manufacturer or Brand.	Place of Sampling.
	Hydrated Lime.	
	Knickerbocker Lime Co., Philadelphia.	
23489	Knickerbocker Hydrated Lime	Glastonbury
	Lee Lime Co., Lee, Mass.	
22830†	Hydrated Lime	Hartford
22831	Agricultural Lime	Hartford
23492	Lee Hydrated Agricultural Lime	Pequabuck
	Clifford L. Miller, Stockbridge, Mass.	
22833†	Hydrated Agricultural Lime	Avon
	New England Lime Co., Danbury.	
20012*	Adam's Granular Finishing Lime	Windsor Locks
20016*	Connecticut Agricultural Lime:	East Canaan
20015*	" "	New Milford
19942*	" "	Willimantic
22832†	Hydrated Lime	Avon
22861†	Agricultural Hydrated Lime, Nelco Brand	Hartford
23483	Burned Lime	Southport
23488	Connecticut Agricultural Lime	New Hartford
23490	Hydrated Mason Lime	Milford
23493	Granular Lime	Hartford
340	Connecticut Agricultural Lime	Middlefield
	Rockland & Rockport Lime Corp., Rockland, Me.	
20187*	R. R. Land Lime	Somers
22856†	R. R. Land Lime	Hartford
23487	R. R. Land Lime, High Calcium Lime	Hazardville
308	R. R. Land Lime	Granby

* Analyzed in 1922.
† Sampled by purchaser.

LIMESTONE, ETC.—*Concluded*

Chemical Analysis.							Mechanical Analysis.					
Lime (CaO).		Magnesia (MgO).		Total oxides.	Insoluble in acid.	Carbon dioxide.	20 mesh.	40 mesh.	50 mesh.	80 mesh.	100 mesh.	Station No.
Found.	Guaranteed.	Found.	Guaranteed.									
%	%	%	%	%	%	%	%	%	%	%	%	
46.10	45.00	29.42	30.00	75.52	1.39	1.56	100.00	100.00	99.00	97.00	95.00	23489
48.57	45.00	33.30	39.00	81.87	1.10	0.71	100.00	100.00	99.00	96.00	94.00	22830
42.16	.....	28.18	.....	70.34	0.80	11.89	55.00	33.00	27.00	24.00	23.00	22831
48.25	.....	32.53	.....	80.78 [1]	1.21	1.36	100.00	100.00	98.00	95.00	94.00	23492
63.46	.....	7.60	.....	71.06	1.43	6.09	99.00	94.00	85.00	75.00	70.00	22833
87.38	.....	4.45	.....	91.83	1.82	2.74	.....	.....	.....	.....	.....	20012
45.86	40.00	31.44	15.00	77.30	0.84	3.00	.....	.....	.....	.....	.....	20016
48.20	40.00	32.53	15.00	80.73	2.73	4.12	.....	.....	.....	.....	.....	20015
50.48	.....	21.00	.....	71.48	3.39	4.85	.....	.....	.....	.....	.....	19942
47.65	.....	24.14	.....	71.79	1.61	13.64	100.00	100.00	99.00	96.00	93.00	22832
42.65	49.34	29.39	33.54	72.04	1.31	12.59	100.00	100.00	100.00	98.00	96.00	22861
46.14	.....	30.75	.....	76.89	0.88	1.58	81.50	67.00	59.50	55.00	54.50	23483
47.31	.....	30.57	.....	77.88	1.65	1.55	100.00	100.00	100.00	98.00	96.50	23488
46.69	.....	30.04	.....	76.73	1.86	0.88	100.00	100.00	100.00	98.00	96.50	23490
87.33	.....	1.34	.....	88.67	2.07	5.84	68.50	36.50	20.50	9.50	7.50	23493
46.23	72.00 [2]	31.38	7.00 [3]	77.61	1.95	1.51	100.00	100.00	100.00	98.50	97.00	340
61.62	60.00	1.69	0.80	63.31	2.00	.....	.....	.....	.....	.....	.....	20187
60.50	60.00	1.24	0.50 [4]	61.74	3.22	20.35	95.00	86.00	78.00	68.00	65.00	22856
59.95	60.00	2.35	0.50 [4]	62.30	3.85	15.88	96.00	88.00	79.50	66.50	63.00	23487
66.40	60.00	1.20	0.50 [4]	67.60	....	10.67	98.50	94.00	90.00	83.00	79.50	308

[1] Guaranty: Total oxides 85 per cent.
[2] Guaranty: 70-80 per cent.
[3] Guaranty: 7-10 per cent.
[4] Guaranty: 0.5-5.0 per cent.

MISCELLANEOUS.

23430. *Potash-Marl.* Potash-Marl, Inc., New York. Sampled by the Station agent from stock of F. H. Leggett & Co., Stamford. Only phosphoric acid is guaranteed.
Analysis:

Available phosphoric acid found 0.42 per cent, guaranteed 0.47 per cent, total 1.05 per cent, guaranteed 1.30 per cent.

This material may contain 6 per cent or more of potash not, however, in water soluble forms. The phosphoric acid and total potash in this fertilizer are probably overvalued at $5.00 per ton but the price quoted is $40.00.

174. *Carbit.* The Hyper-Humus Co., Newton, N. J. This material was sampled from the stock of Olds and Whipple, Inc., Hartford. The chief value claimed for it by the manufacturers is to be found in the beneficial bacteria with which it is inoculated. The Station cannot judge its worth from that standpoint. It is recommended for tobacco and its usefulness can only be determined by experiment.

23235 and **23370.** *Hair Tankage.* Berkshire Fertilizer Co., Bridgeport. Sampled by Station agent at the factory. The two samples contained 2.74 and 3.34 per cent of ammonia respectively. It was guaranteed to contain 3 per cent ammonia.

22966. *Base Goods.* The Rogers and Hubbard Co., Portland. This material was examined for quality of its nitrogen as follows:

Nitrogen in nitrates 0.26 per cent, in ammonia 0.68 per cent, water-soluble organic 2.02 per cent, water-insoluble organic 2.18 per cent, total 5.14 per cent.

The activity of the insoluble organic nitrogen was 66.2 per cent by the alkaline method and 89.6 per cent by the neutral method.

22498. *Burnt Bone.* This was a waste product sent by R. E. Gerth of West Hartford. Most of the nitrogen had been destroyed but the phosphoric acid content was 38.92 per cent.

22967 and **22699.** *Coal.* The first was a sample of Station coal and the second was submitted by C. Q. Eldredge of Mystic. They contained 8.56 and 21.77 per cent of ash respectively.

Eight other samples of unclassified materials including soils require no particular comment.

CHECK COTTONSEED MEAL AND CHECK FERTILIZERS.

The laboratory has continued its co-operation in the program of the American Oil Chemists' Society in testing weekly samples of cottonseed meal, and of the Royster Guano Co. in analyzing monthly samples of various fertilizers. Thirty samples of meal and twelve of fertilizers have been reported.