BULLETIN 308 SEPTEMBER, 1929

Connecticut Agricultural Experiment Station
New Haven

REPORT ON INSPECTION

OF

COMMERCIAL FERTILIZERS

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COMMERCIAL FERTILIZERS FOR 1929

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

CONTENTS.

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THE TUTTLE, MOREHOUSE & TAYLOR COMPANY, NEW HAVEN, CONN.

INSPECTION OF COMMERCIAL FERTILIZERS 1929

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

THE FERTILIZER LAW.

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

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. When sold as a feed, cottonseed meal is subject to registration under the terms of the feed law. By regulation, however, if it is sold exclusively as a fertilizer, or exclusively as a feed, it may be registered but once, and under that law which applies.

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:

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* Analyses were made by Messrs. Nolan, Mathis and Walden; microscopic examinations by Mr. Shepard and Miss Yale; inspection and sampling by Mr. Churchill; and the compilations largely by Mrs. Vosburgh.

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

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."

"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 statement 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 fertilizers 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.

DEFINITIONS AND STANDARDS FOR SOME FERTILIZER MATERIALS.

The Association of Official Agricultural Chemists upon the recommendation of its Committee on Definition of Terms and Interpretation of Results on Fertilizers has approved for final adoption as official, definitions and standards for the following materials:

1. *Limit of chlorine in mixed fertilizers in which potash is claimed as sulphate.* The chlorine in mixed fertilizers in which the potash is claimed as sulphate shall not exceed five-tenths of one per cent (0.5%) more than what is called for in the minimum potash content based on the definition for sulphate of potash as formulated by the committee. Calculate as follows: 0.05 times the percentage of potash found plus 0.5.

2. *Products obtained by heating calcium phosphate with alkali salts containing potash.* These products are *not* potassium phosphate. They may be called non-acid phosphates with potash.

3. *Muriate of potash.* For further consideration.

4. *Sulphate of potash.* Definition was proposed but not approved. For further consideration.

5. *Unleached wood ashes.* Unleached wood ashes are ashes that result from burning unleached wood, that have had no part of their plant food removed, and that contain four per cent (4%) or more of water-soluble potash (K_2O).

6. *Nitrate of Soda.* Nitrate of soda is commercial sodium nitrate containing not less than fifteen per cent (15%) of nitrogen, chiefly as sodium nitrate.

7. *Kainit.* Kainit is a potash salt containing potassium and sodium chlorides and sometimes sulphate of magnesia with not less than twelve per cent (12%) of potash (K_2O).

8. *Dried Blood.* Dried blood is the collected blood of slaughtered animals, dried and ground and containing not less than twelve per cent (12%) of nitrogen in organic forms.

9. *Fertilizer grade.* The grade of fertilizer shall represent the minimum guarantee of its plant food expressed in terms of nitrogen, available phosphoric acid, and water-soluble potash.

The following definitions have also been approved as tentative.

1. *Ground steamed bone.* Ground steamed bone is a product resulting from grinding animal bones that have been previously steamed under pressure.

2. *Ground raw bone.* Ground raw bone is a product resulting from drying and grinding animal bones that have not been previously steamed under pressure.

3. *Tankage.* This term (without qualification) shall be restricted to meat and bone tankage derived from the rendered, dried, and ground by-products from the slaughter of animals, or from carcasses of animals that have died otherwise than by slaughter.

4. *Fish tankage, fish scrap, dry ground fish.* Fish tankage, fish scrap, dry ground fish is the dried ground product derived from rendered or unrendered fish.

5. *Garbage tankage.* Garbage tankage is the rendered, dried, and ground product derived from waste household food materials.

6. *Crude, inert, or slow-acting nitrogenous materials.* Crude, inert, or slow-acting nitrogenous materials are unprocessed organic substances relatively high in nitrogen but having a very low value as plant food and showing a low activity by both the alkaline and neutral permanganate methods (below fifty per cent (50%) and eighty per cent (80%), respectively).

7. *Process tankage.* Process tankages are the products made from crude inert nitrogenous materials by processing under steam pressure, with or without the use of acids, for the purpose of increasing the activity of the nitrogen.

These products shall not be called "tankages" without proper qualification.

8. *Hoof and Horn Meal.* Hoof and horn meal is a product resulting from the processing, drying and grinding of hoofs and horns.

9. *Superphosphate.* Superphosphate is the ground product resulting from mixing finely ground rock phosphate and sulfuric acid or phosphoric acid. The grade should always be used as a prefix to the name. Example: 16% Superphosphate.

It is recommended that the use of the term "Acid Phosphate" be discontinued.

10. *Order of terms.* The order of terms in mixed fertilizers shall be nitrogen first, phosphoric acid second, and potash third.

11. *Statement of guaranties.* It is recommended and urged that the statement of guaranties of mixed fertilizers be given in whole numbers and without fractions.

12. *Acidulated fish tankage, fish scrap, dry ground fish.* Acidulated fish tankage, fish scrap, dry ground fish is the rendered, dried, and ground product derived from fish and with or without treatment with sulfuric acid.

13. *Significance of the name of a fertilizer material used as a brand name of a mixed fertilizer.* When the name of a material is used as a part of the brand name of a mixed fertilizer, as for example blood, or fish, the nitrogen or phosphoric acid shall be derived from or supplied entirely by the material named. When

the name of a material is used as a brand or as part of a brand the word "brand" shall follow the name of the material. Example: "Fish Brand Fertilizer."

14. *Ammoniated superphosphate.* Ammoniated superphosphate is that class of product containing both dissolved phosphate (superphosphate or dissolved bone) and nitrogenous compounds, but without the addition of potash.

15. *Activated sewerage products.* Activated sewerage products are made from sewage freed from grit and coarse solids and aerated after being inoculated with micro-organisms. The resulting flocculated organic matter is withdrawn from the tanks, filtered with or without the aid of coagulants, dried in rotary kilns, ground, and screened.

Other fertilizer materials and soil amendments under consideration by the Committee are: agricultural lime, quicklime, hydrated lime, air-slaked lime, ground limestone, ground shell lime, marl, by-product lime, calcium sulphate, available phosphoric acid, high-analysis fertilizer, soil amendment, peat, charred peat, sulphate of ammonia, urea, and cyanamide.

REGISTRATIONS.

Late Registrations for 1928.

To the brands registered for 1928 in our last report should be added:

L. B. Lovitt & Company, Memphis, Tenn.

"Lovit Brand" 36% Cottonseed Meal
"Lovit Brand" 41% Cottonseed Meal

Memphis Cottonseed Products Company, Memphis, Tenn.

Durham Brand 41% Protein Cottonseed Meal

Registrations for 1929.

For 1929, 67 firms and individuals registered at this Station for sale in this State 422 brands of fertilizers. As required by Statute the brands so registered are listed as follows:

American Agricultural Chemical Company, New Haven Sales Dept., New Haven, Conn.

A.A.C. Acme Fertilizer
A.A.C. Aroostook Potato Manure
A.A.C. Castor Pomace
A.A.C. Complete General Fertilizer
A.A.C. Cotton Seed Meal
A.A.C. Double A Tobacco Fertilizer
A.A.C. Dry Ground Fish
A.A.C. Gladiator Fertilizer
A.A.C. Grass & Lawn Top Dressing
A.A.C. Ground Tankage
A.A.C. Hi-Grade Tobacco Manure
A.A.C. Monarch Fertilizer
A.A.C. Muriate of Potash
A.A.C. Nitrate of Soda
A.A.C. Pulverized Sheep & Goat Manure
A.A.C. Prolific 10% Potash Fertilizer
A.A.C. Special Grass Top Dressing
A.A.C. Special Ground Bone
A.A.C. Sulphate of Ammonia
A.A.C. Sulphate of Potash
A.A.C. 16% Superphosphate
A.A.C. Tobacco Starter
Agrico for Corn
Agrico for Potatoes
Agrico for Truck
Bowker's All Round Fertilizer
Bowker's Market Garden Fertilizer
Bowker's Potato & Vegetable Phosphate
Bowker's Stockbridge Early Crop Manure
Bowker's Stockbridge Hill & Drill Fertilizer
Bowker's Stockbridge Tobacco Manure
Bradley's Blood, Bone & Potash
Bradley's Complete Manure for Potatoes & Vegetables
Bradley's Complete Tobacco Manure
Bradley's Northland Potato Grower

Bradley's Potato Fertilizer
Bradley's Potato Manure
Bradley's XL Superphosphate of Lime
National Aroostook Special Fertilizer
National Complete Tobacco Fertilizer
National Market Garden Fertilizer
National Pine Tree State Potato Fertilizer
National Premier Potato Manure
Sanderson's Atlantic Coast Mixture
Sanderson's Complete Tobacco Grower
Sanderson's Corn Superphosphate
Sanderson's Formula A
Sanderson's Formula B
Sanderson's Potato Manure

American Cyanamid Company, 535 Fifth Ave., New York City.

Aero Brand Cyanamid
Ammo Phos B
Ammo-Phos-Ko No. 1
Ammo-Phos-Ko No. 2
Ammo-Phos-Ko No. 3

Anglo-Chilean Nitrate Sales Corporation, 120 Broadway, New York City.

Nitrate of Soda

Apothecaries Hall Company, Waterbury, Conn.

Acid Phosphate (Superphosphate)
Basic Slag Phosphate
Bone Meal 3-22
Bone Meal 4-20
Bone & Meat Tankage
Carbonate of Potash
Castor Pomace
Cotton Seed Meal
Dry Ground Fish
Lawn Fertilizer
Liberty Corn & All Crops 2-8-2
Liberty Corn, Fruit & All Crops, 2-12-4
Liberty Double Strength, 10-16-14
Liberty Fish, Bone & Potash, 3-8-3
Liberty High Grade Market Gardener's, 5-8-7
Liberty High Grade Tobacco Manure, 7-3-7
Liberty Onion Special (Potash as Sulphate) 4-8-7
Liberty Potato & General Crops, 4-8-10
Liberty Potato & Market Gardener's Special, 4-8-4
Liberty Potato & Vegetable, 2-8-10
Liberty Special Fertilizer for Fruit, 7-8-6
Liberty Tobacco Special (Cotton Seed Meal Base), 5-3-5
Liberty Top Dresser for Grass & Grain, 10-3½-8
Muriate of Potash
Nitrate of Soda
Nitrate of Soda & Potash
Precipitated Bone
Sulphate of Ammonia
Sulphate of Potash
Sulphate of Potash & Magnesia
Tankage

Armour Fertilizer Works, 50 Broad St., New York City.

Armour Big Crop Bone Meal 3-48
Armour Big Crop Fertilizer 2-12-4
Armour Big Crop Fertilizer 3-8-4
Armour Big Crop Fertilizer 4-6-10
Armour Big Crop Fertilizer 4-8-4
Armour Big Crop Fertilizer 4-8-7
Armour Big Crop Fertilizer 4-16-4
Armour Big Crop Fertilizer 5-8-7
Armour Big Crop Fertilizer 5-15-5
Armour Big Crop Fertilizer 7-11-10
Armour Big Crop Fertilizer 7-12-7
Armour Big Crop Fertilizer 8-6-6
Armour Big Crop Tobacco Fertilizer 7-3-7
Armour Big Crop Tobacco Special 5-3-5
Armour Big Crop Super Phosphate 16%
Armour Big Crop Super Phosphate 20%
Armour Lawn & Garden Grower 6-8-6
Castor Pomace
Cotton Seed Meal
Ground Tankage
Muriate of Potash
Nitrate of Soda
NPK 9-18-18
NPK 9-27-9
Sheep & Goat Manure
Sulphate of Ammonia
Sulphate of Potash

Ashcraft-Wilkinson Company, Atlanta, Ga.

Helmet Brand Cottonseed Meal
Monarch Brand Cottonseed Meal
Paramount Brand Cottonseed Meal

Associated Seed Growers, Inc., New Haven, Conn.

Nitrate of Soda
16% Acid Phosphate
Special Mixture for General Use
Special Mixture with 6% Potash
Tip Top Brand

Baker Castor Oil Company, 120 Broadway, New York City.

Castor Pomace

Barrett Company, 40 Rector St., New York City.

Arcadian Nitrate of Soda
Arcadian Sulphate of Ammonia
Sulphate of Ammonia

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

Bartlett Green Tree Food

The Berkshire Chemical Company, Bridgeport, Conn.

Berkshire Castor Pomace
Berkshire Complete Fertilizer
Berkshire Complete Tobacco Fertilizer
Berkshire Dry Ground Fish

Berkshire Economical Grass Fertilizer
Berkshire Fine Ground Bone
Berkshire Grass Special Fertilizer
Berkshire Long Island Special Fertilizer
Berkshire Market Garden Fertilizer
Berkshire Sheep Manure
Berkshire Super Phosphate
Berkshire Tobacco Special Fertilizer
Berkshire Tobacco Starter Fertilizer
Berkshire Truck Fertilizer
High Grade Sulphate Potash
Muriate of Potash
Nitrate of Soda

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

Corn, Onion, Potato and General Purpose
Special Tobacco Fertilizer

F. W. Brode Corporation, Memphis, Tenn.

Owl Brand 41% Prime Cottonseed Meal

A. H. Case & Company, Inc., 965 William St., Buffalo, N. Y.

Par Plus Brand Reinforced Sheep Manure

The E. D. Chittenden Company, Bridgeport, Conn.

Castor Pomace
Chittenden's Complete Tobacco & Onion Grower
Chittenden's High Grade Potato
Chittenden's Potato Special
Chittenden's Tobacco Special

Conn. Fat Rendering & Fertilizer Corporation, West Haven, Conn.

Tankage

Consolidated By-Product Company, 30th and Race Sts., Philadelphia, Pa.

Consolidated Bone Meal

Consolidated Rendering Company, Boston, Mass.

Castor Pomace
Corenco Sheep Manure
Dry Ground Fish
Ground Bone
Muriate of Potash
Nitrate of Soda
Sulphate of Ammonia
Sulphate of Potash
Superphosphate (Acid Phos. 16%)
Superphosphate (Acid Phos. 20%)
Tankage 6-30
Tankage 9-20

C & R Sales Company, Worcester, Mass.

C & R Lawn Shrub Fertilizer 5-6-5

Davey Tree Expert Company, So. Water St., Kent, Ohio.

Davey Shredded Cattle Manure
Davey Tree Food

Eastern States Farmers' Exchange, Springfield, Mass.

Eastern States Ammo-Phos
Eastern States Basic Slag
Eastern States Calurea
Eastern States Castor Pomace
Eastern States Dry Ground Fish
Eastern States Fine Bone Meal
Eastern States Ground Animal Tankage
Eastern States Muriate of Potash
Eastern States Nitrate of Potash
Eastern States Nitrate of Soda
Eastern States Nitrogenous Tankage
Eastern States Open Formula 0-14-6
Eastern States Open Formula 4-8-8
Eastern States Open Formula 4-10-6
Eastern States Open Formula 4-12-4
Eastern States Open Formula 4-20-16
Eastern States Open Formula 6-8-6
Eastern States Open Formula 6-15-9
Eastern States Open Formula 6-18-6
Eastern States Open Formula 8-4-8
Eastern States Open Formula 8-16-16
Eastern States Open Formula 8-16-16 Potash from Sulphate
Eastern States Open Formula 10-5-10
Eastern States Precipitated Bone
Eastern States Sulphate of Ammonia
Eastern States Sulphate of Potash
Eastern States Sulphate of Potash Magnesia
Eastern States Superphosphate 16%

Ed. Eggert, Hartford, Conn.

Diamond "EE" Brand Cottonseed Hull Ashes

Essex Fertilizer Company, Boston, Mass.

Essex Complete Manure 5-8-7
Essex Fish Fertilizer for All Crops 3-8-4
Essex Market Garden 4-8-4
Essex Peerless Potato Manure 4-6-10
Essex Top Dressing 7-6-5

Friedman Tobacco Products Corporation, 240 No. George St., York, Pa.

Double Duty Tobacco Dust Fertilizer

The L. T. Frisbie Company, New Haven, Conn.

Frisbie's Corn & Grain Fertilizer 2-10-2
Frisbie's Fine Bone Meal
Frisbie's 5-8-7
Frisbie's 5-10-5
Frisbie's Market Garden 5-8-7
Frisbie's Special 3-8-4
Frisbie's Special Vegetable & Potato Grower 4-8-4
Frisbie's Tobacco Grower 7-3-7
Frisbie's Top Dresser 8-6-5

Ford Motor Company, Fordson, Michigan.
Ford Ammonium Sulphate

The Grasselli Chemical Company, Cleveland, Ohio.
Grasselli Odorless Plant Food

Humphreys-Godwin Company, Memphis, Tenn.
Bull Brand Cottonseed Meal
Danish Brand Cottonseed Feed
Dixie Brand Cottonseed Meal

International Agricultural Corporation, 33 Chauncy St., Boston, Mass.
Caribee Tobacco Fertilizer
Premium Tobacco Fertilizer

John Joynt, Lucknow, Ontario, Canada.
Joynt Brand "Canada Hardwood Ashes"

Kelloggs & Miller, Inc., Amsterdam, N. Y.
"K & M" Brand Pure Old Process Linseed Oil Meal

Spencer Kellogg & Sons, Inc., Buffalo, N. Y.
Castor Pomace
"Kellogg's Pure Old Process Linseed Meal" 5.14%
"Kellogg's Pure Old Process Linseed Meal" 6.22%

L. B. Lovitt & Company, Memphis, Tenn.
"Lovit Brand" 41% Cottonseed Meal

Lowell Fertilizer Company, Boston, Mass.
Lowell Animal Brand A High Grade Manure for All Crops 3-8-4
Lowell Bone Fertilizer 2-10-2
Lowell Corn and Vegetable 4-8-4
Lowell Market Garden Manure 5-8-7
Lowell Potato Grower 4-6-10
Lowell Tobacco Manure 5-3-5
Lowell Top Dressing 7-6-5

Maine Farmers' Exchange, 801 Chapman Bldg., Portland, Me.
M.F.E. "Produce-More" 3-10-3
M.F.E. "Produce-More" 4-8-5
M.F.E. "Produce-More" 5-8-7

The Mapes Formula & Peruvian Guano Co., 270 Madison Ave., New York City.
The Mapes Connecticut Valley Special
The Mapes Corn Manure
The Mapes General Tobacco Manure
The Mapes General Truck Manure
The Mapes General Use Manure
The Mapes Onion Manure
The Mapes Potato Manure
The Mapes Special Trucker

The Mapes Special Trucker "SP."
The Mapes Tobacco Ash Constituents
The Mapes Tobacco Ash & Starter
The Mapes Tobacco Manure, Wrapper Brand
The Mapes Tobacco Starter Improved
The Mapes Top Dressing
Castor Pomace
Nitrate of Soda
Pure Fine Ground Bone
Sulphate of Potash

Marianna Sales Company, Memphis, Tenn.

White Mule Brand Cotton Seed Meal

A. G. Markham & Company, 20 Stockbridge St., Springfield, Mass.

4-6-10
4-8-4
5-8-7

Millane Tree Expert Company, Cromwell, Conn.

Millane Shade Tree Food

Natural Guano Company, Aurora, Ill.

"Sheep's Head" Pulverized Sheep Manure

New England Fertilizer Company, Boston, Mass.

New England Complete Manure 4-6-10
New England Corn Phosphate 2-10-2
New England Market Garden Manure 5-8-7
New England Potato and Vegetable Manure 4-8-4
New England Super A High Grade Fertilizer For All Crops 3-8-4
New England Tobacco Manure 5-3-5

Old Deerfield Fertilizer Company, Inc., South Deerfield, Mass.

Old Deerfield Tobacco Starter, Bone & Potash
Special Tobacco Formula

Olds & Whipple, Inc., Hartford, Conn.

High Grade Carbonate of Potash 96/98
High Grade Sulphate of Potash
O. & W. Acid Phosphate
O. & W. Blue Label Tobacco Fertilizer
O. & W. Castor Pomace
O. & W. Complete Market Garden Fertilizer
O. & W. Complete Tobacco Fertilizer
O. & W. Dry Ground Fish
O. & W. Favorite Sheep Manure
O. & W. Grass Fertilizer
O. & W. High Grade Potato & Vegetable Fertilizer
O. & W. High Grade Starter & Potash Compound
O. & W. High Grade Tobacco Starter
O. & W. Nitrate of Soda
O. & W. Nitrate of Potash 95%
O. & W. Precipitated Bone Meal
O. & W. Pure Bone Meal
O. & W. Sulphate of Ammonia

Pacific Manure & Fertilizer Company, 429 Davis St., San Francisco, Cal.
Groz-It Pulverized Sheep Manure

Parmenter & Polsey Fertilizer Company, Boston, Mass.
"P & P" Maine Potato Fertilizer 4-6-10
Parmenter & Polsey Top Dressing 7-6-5

Piedmont-Mt. Airy Guano Company, Inc., Baltimore, Md.
Harvest Brand 2-8-3
Harvest Brand 4-8-4
Harvest Brand 5-8-7
Nitrate of Soda

Frank S. Platt Company, New Haven, Conn.
Platt's Concentrated Lawn Fertilizer
Platco Special 5-8-7

Premier Poultry Manure Company, 3-8 W. Washington St., Chicago, Ill.
Premier Brand Poultry Manure
Premier Brand Sheep Manure

Pulverized Manure Company, Chicago, Ill.
Wizard Brand Cattle Manure
Wizard Brand Pulverized Sheep Manure

Rackliffe Bros. Company, Inc., New Britain, Conn.
Rackliffe Brand Corn Fertilizer 4-8-4
Rackliffe Brand Potato and Special Vegetable 5-8-7

The Rogers & Hubbard Company, Portland, Conn.
4-8-4 Fertilizer
5-8-7 Fertilizer
5-10-15 Fertilizer
Hubbard's "Bone Base" Fertilizer for Seeding Down
Hubbard's "Bone Base" Oats and Top Dressing
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
Lawn Fertilizer
Nitrate of Soda
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
Rogers & Hubbard's Tunaker Tobacco Brand
Superphosphate

F. S. Royster Guano Company, Baltimore, Md.
Royster's Connecticut Tobacco Guano
Royster's Curlew Guano
Royster's 5% Truck Guano

Royster's Gem Guano
Royster's Quality Trucker
Royster's Sheep and Goat Manure
Royster's 16% Super Phosphate
Royster's Top Dresser

Ruhm Phosphate & Chemical Company, Mt. Pleasant, Tenn.

Ruhm's Lime Phosphate (Phosphate Rock, washed and ground)

Sewerage Commission of the City of Milwaukee, Milwaukee, Wis.

Milorganite

M. L. Shoemaker & Company, Inc., Philadelphia, Pa.

Special Mixture of "Bantle's Wrapper Brand"
"Swift-Sure" Bone Meal 4½-47
"Swift-Sure" Potato Special 5-8-7
"Swift-Sure" Special Tobacco Formula 4-8-5
"Swift-Sure" Tobacco & General Use 3-10-3

Springfield Rendering Company, Springfield, Mass.

Springfield 3-8-4 Fertilizer
Springfield 4-8-4 Fertilizer
Springfield 4-8-7 Fertilizer
Springfield 5-8-7 Fertilizer
Springfield 5-3-5 Tobacco Special
Springfield 7-6-5 Top Dresser

Standard Wholesale Phosphate & Acid Works, Inc., Baltimore, Md.

5 x 4 x 5
5 x 10 x5
8 x 6 x 6
Animal Tankage 6%
Animal Tankage 9%
Animal Tankage 10%
Castor Pomace
Evergreen Fish Guano
Fish Bone & Potash
Fish Meal
Golden Rule Grower
Golden Rule Guano
Grain Grower
High Analysis
Ideal Potato Grower
Jersey Special
Mammoth Potato Grower
Muriate of Potash
Nitrate of Soda
Old Fertility
Raw Bone Meal
Steamed Bone Meal
Sulphate of Ammonia
Sulphate of Potash
Superphosphate 16%
Superphosphate 20%
Truckers Fish Guano

Swift & Company Fertilizer Works, Baltimore, Md.

Vigoro

Synthetic Nitrogen Products Corporation, 285 Madison Ave., New York City.

Calcium Nitrate Basf (Nitrate of Lime)
Calurea
Nitrophoska I
Nitrate of Potash
Urea Basf (Floranid)

Tennessee Copper & Chemical Corporation, Lockland, Cincinnati, Ohio.

Loma

I. P. Thomas & Son Company, 1000 Drexel Bldg., Philadelphia, Pa.

Castor Pomace
Dairymen's Special 0-10-10
Economy Fertilizer 3-12-3
I. P. Thomas 5-8-7
Long Island Special 4-8-7
Muriate of Potash
Nitrate of Soda
Pure Ground Bone
7% Guano 7-6-5
Sheep & Goat Manure
16% Superphosphate
Thomas' Tobacco Grower
Tip Top 3-10-6
Truckers High Grade Guano 4-8-4
Victor Potash Fertilizer 2-8-5

Triton Oil and Fertilizer Company, 101 Beekman St., New York City.

Nitrate of Soda
Triton 4-8-4 Fertilizer
Triton 5-8-7 Fertilizer

Wessel, Duval & Company, 1 Broadway, New York City.

Nitrate of Soda

Wilcox Fertilizer Company, 56 West Main St., Mystic, Conn.

Acid Phosphate
Castor Pomace
Ground Steamed Bone
Muriate of Potash
Nitrate of Soda Potash
Sulphate of Ammonia
Wilcox Corn Special 3-10-4
Wilcox Dry Ground Fish
Wilcox High Grade Fish & Potash 4-8-4
Wilcox Potato & Vegetable Phosphate 5-8-7
Wilcox Top Dresser 7-6-5

Virginia-Carolina Chemical Corporation, Richmond, Va.

Bloomaid
Fine Ground Bone
Nitrate of Soda

V-C Aroostook Potato Grower
V-C Fairway Fertilizer
V-C Fish & Potash Compound
V-C Phospho-Tobacco Dairy Absorbent
V-C 16% Superphosphate
V-C XXXX Fish & Potash

S. D. Woodruff & Sons, Orange, Conn.

Woodruff's Home Mixed Fertilizer

Worcester Rendering Company, Auburn, Mass.

Prosperity Brand Complete Dressing
Prosperity Brand Corn & Grain Fertilizer
Prosperity Brand Market Garden Fertilizer
Prosperity Brand Potato & Vegetable Fertilizer
Special Potato Fertilizer
Superior Top Dressing

INSPECTION OF 1929.

The Station Agent has visited 93 towns and villages in the State and has drawn 480 official samples of fertilizer, including all of the registered brands which could be found. These, together with samples submitted by purchasers and others interested, are classified as follows:

CLASSIFICATION OF FERTILIZERS ANALYZED IN 1929.

	No. of Samples	Page
I. *Containing Nitrogen as the chief active ingredient:*		
Nitrate of Soda	24	22
Calcium Nitrate (Nitrate of Lime)	1	22
Calurea	4	22
Urea	1	23
Sulphate of Ammonia	11	27
Castor Pomace	47	27
Cottonseed Meal	137	31
Linseed Meal	19	32
II. *Containing Phosphoric Acid as the chief active ingredient:*		
Precipitated Bone Phosphate	12	39
Superphosphate	18	39
Basic Slag	1	39
III. *Containing Potash as the chief ingredient:*		
Carbonate of Potash	25	44
Muriate of Potash	10	44
Sulphate of Potash	19	44
Sulphate of Potash-Magnesia	2	44
Cotton Hull Ashes	60	45
IV. *Containing Nitrogen and Potash:*		
Nitrate of Potash	8	54
Nitrate of Potash and Soda	3	54
V. *Containing Nitrogen and Phosphoric Acid:*		
Dry Ground Fish	38	56
Tankage	11	57
Ground Bone	35	57
VI. *Mixed Fertilizer:*		
Containing Nitrogen and Phosphoric Acid	5	66
Containing Phosphoric Acid and Potash	2	66
Containing Nitrogen and Potash	1	66
Containing Nitrogen, Phosphoric Acid and Potash	248	67
Special and Home Mixtures	67	93
VII. *Miscellaneous:*		
Sheep Manure, etc.	15	93
Lime, etc.	7	93
Other miscellaneous materials	40	93
Collaborative check meals and fertilizers	42	93
Total	913	

RAW MATERIALS CHIEFLY VALUABLE FOR NITROGEN.

NITRATE OF SODA.

Nitrate of Soda is a nitrogen salt containing not less than 15 percent of nitrogen, largely as sodium nitrate.[1] Ammonia equivalent to the nitrogen usually ranges from 18.2 to 19.5 percent, which represents 91 to 97 percent of nitrate of soda.

This raw material is obtained from the west coast of South America, chiefly from Chile, where large deposits of the crude salt are found. Until recently this has been practically the sole source of this form of agricultural nitrogen, but it now finds competition from nitrate made in Europe from synthetic nitric acid and soda. However, natural deposits of nitrate are not likely to be exhausted for many years to come and improvement in methods of refining will probably enable the natural product to maintain an important place in the fertilizer market.

Twenty-four samples were analyzed and the average nitrogen content found to be 15.53 per cent. All equalled or exceeded guaranties, except in two instances, one of which was negligible. The other involved a shortage of 0.3 per cent.

Eleven price quotations ranged from $65 to $80 a ton and averaged $70. Nitrogen from this source was bought at an average of about 25 cents a pound.

Analyses are given in Table I.

CALCIUM NITRATE.

This material is now being produced in quantity in Europe, where nitrogen of the air is converted into nitric acid and then combined with limestone to form calcium nitrate. It readily absorbs moisture and is shipped in drums or in paper lined bags to protect it from moisture.

The commercial article as offered in the fertilizer trade usually contains about 15.5 per cent of nitrogen. The one sample examined this year was guaranteed 15 per cent and 15.28 per cent was found.

Analysis appears in Table I.

CALUREA.

Calurea is a trade name for one of the synthetic ammoniates and is a combination of urea and calcium nitrate. About one-fifth of its nitrogen is derived from nitrate and the remainder is in organic form. It is generally guaranteed to contain 34 per cent of total nitrogen which is equivalent to 41.3 per cent of ammonia.

Four samples were examined this year, two of which were some-

[1] A.O.A.C. definition.

what under the guaranty of 34 per cent. The deficiencies were 0.32 and 0.48 per cent, respectively.

Analyses are given in Table I.

UREA.

This product is now made synthetically in considerable quantities in Europe from synthetic ammonia and carbon dioxide. It furnishes organic nitrogen in water soluble form. The usual guaranty is 46 per cent of nitrogen and the one sample examined this year fully met that specification. No price quotation was given, but nitrogen from this source may be valued at about 15 cents a pound.

Analysis appears in Table I.

TABELE I. ANALYSES OF NITRATE OF SODA, ETC.

Station No.	Manufacturer or Jobber.	Purchased, Sampled or Sent by	Per cent. Nitrogen. Found.	Per cent. Nitrogen. Guaranteed.
	Nitrate of Soda.			
1379	American Agricultural Chemical Co., New York	Station agent. Stock of S. P. Strople, New Britain	15.40	15.22
1405	Apothecaries Hall Co., Waterbury, Conn.	Station agent. Stock of J. A Glasnapp, West Cheshire	15.46	14.80
947	Apothecaries Hall Co., Waterbury, Conn.	Hatheway & Steane, Inc., Hartford	15.88	14.80
948	Apothecaries Hall Co., Waterbury, Conn.	Hatheway & Steane, Inc., Hartford	15.64	14.80
1271	Apothecaries Hall Co., Waterbury, Conn.	Hatheway & Steane, Inc., Hartford	15.60	14.80
1662	Apothecaries Hall Co., Waterbury, Conn.	Hatheway & Steane, Inc., Hartford	15.42	14.80
1720	Apothecaries Hall Co., Waterbury, Conn.	A. N. Shepard & Son., Hartford	15.74	14.80
1561	Armour Fertilizer Works New York	Station agent. Stock of Raven's Hardware Co., Meriden	15.66	14.81
1584	Associated Seed Growers, New Haven, Conn.	Station agent. Stock of Associated Seed Growers, Milford	15.82	15.00
1449	The Barrett Co., New York	Station agent. Stock of W. S. Eaton, Plainville	16.16	16.25
682	Berkshire Chemical Co. Bridgeport, Conn.	American Sumatra Tobacco Co. Bloomfield	15.28	15 00
683	Berkshire Chemical Co. Bridgeport, Conn.	American Sumatra Tobacco Co. Bloomfield	15 52	15.00
684	Berkshire Chemical Co. Bridgeport, Conn.	American Sumatra Tobacco Co. Bloomfield	15 48	15 00
763	Berkshire Chemical Co., Bridgeport, Conn.	American Sumatra Tobacco Co., Bloomfield	15.46	15.00
998	Berkshire Chemical Co. Bridgeport, Conn.	James T. Burgess, Thompsonville	15.58	15.00
1375	Berkshire Chemical Co. Bridgeport, Conn.	Station agent. Stock of J. A. Smith, Hamden	16.08	15.00
1369	Consolidated Rendering Co. Boston, Mass.	Station agent. Stock of H. D. Peters, Highwood	15.48	15.22
1443	Eastern States Farmers' Exchange, Springfield, Mass.	Station agent. Stock of Hoyt's Nurseries, New Canaan	15.68	15.00
1476	Olds & Whipple, Inc., Hartford, Conn.	Sation agent· Stock of F. T. Blish Hardware Co., So. Manchester	15.86	15.00
1415	The Rogers & Hubbard Co., Portland, Conn.	Station agent. Stock of Cadwell & Jones, Hartford	14.50	14.80
1399	Standard Phosphate & Acid Works, Baltimore, Md.	Station agent. Stock of Peter Aldo, Milford	15.08	15.00

TABLE I. ANALYSES OF NITRATE OF SODA, ETC.—*Concluded.*

Station No.	Manufacturer or Jobber.	Purchased, Sampled or Sent by	Per cent. Nitrogen. Found.	Per cent. Nitrogen. Guaranteed.
	Nitrate of Soda.			
1618	I. P. Thomas & Son, Philadelphia, Pa.	Station agent. Stock of Ira W. Beers, Hamden	15.36	15.00
1675	Triton Oil & Fertilizer Co. New York	Station agent. Stock of F. H. Woodruff & Son, Milford	15.48	14.80
1630	Virginia-Carolina Chemical Co., New York	Station agent. Stock of Stanley Svea Coal Co., New Britain	15.12	14.80
	Calcium Nitrate. (Nitrate of Lime)			
1615	Synthetic Nitrogen Products Co., New York	Station agent. Stock of Olds & Whipple, Inc., Hartford	15.28	15.00
	Calurea.			
1704	Synthetic Nitrogen Products Co., New York	L. Wetstone & Sons, Hartford	34.00	34.00
1613	Synthetic Nitrogen Products Co., New York	Station agent. Stock of Olds & Whipple, Inc., Hartford	33.68	34.00
1902	Synthetic Nitrogen Products Co., New York	Station agent. Stock of John Richards, So. Glastonbury	34.08	34.00
2031	Synthetic Nitrogen Products Co., New York	Chas. D. Lewis, Hartford	33.52	34.00
	Urea.			
1614	Synthetic Nitrogen Products Co., New York	Station agent. Stock of Olds & Whipple, Inc., Hartford	46.04	46.00

TABLE II. ANALYSES OF SULPHATE OF AMMONIA.

Station No.	Manufacturer or Jobber.	Purchased, Sampled or Sent by	Per cent. Nitrogen.	
			Found.	Guaranteed.
1389	American Agricultural Chemical Co., New York	Station agent. Stock of S. P. Strople, New Britain	20.68	20.56
1564	Armour's Fertilizer Works New York	Station agent. Stock of F. A. Bartlett Tree Expert Co., Stamford	20.80	20.56
1409	Apothecaries Hall Co., Waterbury, Conn.	Station agent at factory	21.10	20.58
1403	The Barrett Co., New York	Station agent. Stock of Berkshire Chemical Co., Bridgeport	21.04	20.75
1402	The Barrett Co., New York	Station agent. Stock of Berkshire Chemical Co., Bridgeport	20.68	20.50
1423	Consolidated Rendering Co., Boston, Mass.	Station agent. Stock of L. T. Frisbie Co., New Haven	20.58	20.50
1794	Eastern States Farmers' Exchange, Springfield, Mass.	Station agent. Stock of C. D. Prentice, North Haven	20.64	20.50
1876	Ford Motor Co., Detroit Mich.	Station agent. Stock of J. N. Adams, Willimantic	20.96	20.80
1469	Olds & Whipple, Inc., Hartford, Conn.	Station agent at factory	20.72	20.58
1397	Standard Phosphate & Acid Works, Baltimore, Md.	Station agent. Stock of Geo. S. Jennings, Southport	19.92	20.56
1641	Wilcox Fertilizer Co., Mystic, Conn.	Station agent at factory	20.76	20.56

SULPHATE OF AMMONIA.

In this country sulphate of ammonia is made almost entirely from sulphate acid and ammonia obtained in the production of coke and illuminating gas. In Europe it is now made on a large scale from synthetic ammonia, gypsum and carbon dioxide.

So called "Arcadian" sulphate of ammonia is specially treated, dried and screened to remove lumps and insure good mechanical condition.

The grade offered for fertilizer purposes will contain about 20.5 per cent of nitrogen and is generally so guaranteed. All of the eleven samples examined this year met or exceeded guarantees with the exception of No. 1397, which was deficient by about 0.6 per cent. The average nitrogen content for all samples was 20.71 per cent. Ton price quotations were so few and variable that average cost to the purchaser cannot be fairly estimated, but a fair valuation for nitrogen from this source may be taken at about 14.5 cents a pound.

Analyses are given in Table II.

CASTOR POMACE.

Castor Pomace is the ground residue left after removal of the oil from castor beans. It should be stored where farm animals will not have access, as it is poisonous if eaten.

This raw material is chiefly valuable as a fertilizer for its nitrogen, although it also contains small amounts of phosphoric acid and potash.

Forty-seven samples were examined, all sold under guaranties of about 4.5 per cent nitrogen. The average nitrogen found was 4.75 per cent and only five samples failed to meet guaranties by amounts greater than 0.1 per cent. There has been some impression that castor pomace was of rather poorer quality than usual this year, but our figures show no significant variation in quality. Averages for nitrogen for the past three years, according to our records are 4.75, 5.10 and 4.80 per cent as compared with 4.75 this year.

The prevailing ton price, so far as prices were quoted to our agent, has been $30, and the average is $30.15. With no allowance for phosphoric acid and potash, nitrogen from this source has cost about 31.5 cents a pound. This compares with 30 cents last year and with 24 and 23.2 cents for the two years preceding.

Analyses are given in Table III.

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.			
1735	.....	Station agent. Stock of E. J. Bantle, Glastonbury	4.58	4.52
	Apothecaries Hall Co., Waterbury, Conn.			
1406	.....	Station agent. Stock of J. A. Glasnapp, West Cheshire	4.54	4.52
822	Car No. 11645	Hatheway & Steane, Inc., Hartford	4.66	4.52
823	Car No. 11264	Hatheway & Steane, Inc., Hartford	5.06	4.52
824	Car No. 13716	Hatheway & Steane, Inc., Hart ford	5.24	4.52
825	Car No. 570146	Hatheway & Steane, Inc., Hartford	4.46	4.52
826	Car No. 203652	Hatheway & Steane, Inc., Hartford	5.32	4.52
857	Car No. 17597	Hatheway & Steane, Inc., Hartford	5.10	4.52
949	Car No. 515318	Hatheway & Steane, Inc., Hartford	5.00	4.52
950	Car No. 533981	Hatheway & Steane, Inc., Hartford	4.10	4.52
951	Car No. 41961	Hatheway & Steane, Inc., Hartford	4.49	4.52
1268	Car No. 10133	Hatheway & Steane, Inc., Hartford	5.19	4.52
1657	Truck No. 4791	Hatheway & Steane, Inc., Hartford	5.52	4.52
1722	Car No. 17301	A. N. Shepard & Son., Hartford	4.54	4.52
	Armour Fertilizer Works, New York City.			
1949	.....	Station agent. Stock of James T. Caffrey, Cromwell	4.62	4.52
	Baker Castor Oil Co., New York City.			
895	Car No. 10850	American Sumatra Tobacco Co. Bloomfield	4.88	4.50
896	Car No. 35839	American Sumatra Tobacco Co. Bloomfield	5.24	4.50

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.	Guaranteed.
	Baker Castor Oil Co., New York City.			
897	Car No. 17182	American Sumatra Tobacco Co. Bloomfield	4.77	4.50
1230	Car No. 17911	American Sumatra Tobacco Co. Bloomfield	4.50	4.50
1448	.....	Station agent. Stock of Olds & Whipple, Inc., Hartford	4.98	4.50
1900	.....	Station agent. Stock of John Richards, So. Glastonbury	4.80	4.50
	Berkshire Chemical Co., Bridgeport, Conn.			
1258	Car No. 171163	Station agent. Stock of Cullman Bros. Hartford	4.34	4.52
1260	.....	Station agent. Stock of James T Burgess, Thompsonville	4.58	4.52
1905	.....	Station agent. Stock of Lester W Lloyd, Suffield	4.43	4.52
1944	.....	Station agent. Stock of G. A. Peckham, Suffield	4.50	4.52
879	Car N. H. 167387	Cullman Bros., Hartford	4.59	4.52
886	Car B. & M. 70062	Cullman Bros., Hartford	4.66	4.52
1001	.....	James T. Burgess, Thompsonville	4.21	4.52
1023	Car No. 171163	Cullman Bros., Hartford	4.15	4.52
1024	Car No. 163194 N. H.	Cullman Bros., Hartford	4.26	4.52
1025	Car N. H. 150236	Cullman Bros., Hartford	4.90	4.52
1026	Car N. H. 164131	Cullman Bros., Hartford	4.84	4.52
1027	Car N. H. 164215	Cullman Bros., Hartford	5.00	4.52
1028	Car C. of N. J. 30208	Cullman Bros., Hartford	4.70	4.52
1853	Car P. R. R. 516474	Spencer Bros., Inc., Suffield	4.81	4.52
1855	Car N. Y. 71365	Spencer Bros., Inc., Suffield	4.76	4.52
	E. D. Chittenden Co., Bridgeport, Conn.			
2041	.....	Station agent. Stock of J. P. Norton, Broad Brook	4.58	4.50
	Consolidated Rendering Co., Boston, Mass.			
1419	.....	Station agent. Stock of L. T. Frisbie Co., New Haven	4.95	4.52
	Spencer Kellogg & Sons, Buffalo, N. Y.			
1455	.....	Station agent. Stock of S. D. Woodruff & Sons, Orange	4.62	4.52

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.
	Mapes Formula & Peruvian Guano Co., New York City.			
1414	.....	Station agent. Stock of Mapes Branch, Hartford	4.76	4.52
1285	Car C. N. J. 21191	John P. Cranouski, Poquonock ..	4.61	4.52
	Olds & Whipple, Inc., Hartford, Conn.			
2065	.....	Station agent at factory	4.53	4.53
1687	.....	Silberman & Kahn, Hartford	5.35	4.53
1707	Car 98792	L. Wetstone & Sons, Hartford ..	4.86	4.53
1780	Car P. R. R. 38403	Silberman & Kahn, Hartford	4.77	4.53
	Standard Wholesale Phosphate & Acid Works, Baltimore, Md.			
1921	.....	Station agent. Stock of H. H. McKnight, Ellington	5.36	4.52
	Wilcox Fertilizer Co., Mystic, Conn.			
2045	.....	Station agent. Stock of Patrick Foram, East Hartford	4.56	4.52

COTTONSEED MEAL.

In Connecticut, cottonseed meal is largely used for fertilizer purposes, particularly in mixtures for tobacco. It is sold, however, under classifications as laid down by the Association of Feed Control Officials of the United States, which are as follows:

"*Cottonseed Meal* is a product of the cottonseed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of oil, provided that nothing shall be recognized as cottonseed meal that does not conform to the foregoing definition and that does not contain at least 36 per cent of protein. Cottonseed meal shall be graded and classed as follows:

1. "*Cottonseed Meal, Prime Quality.* Cottonseed meal, prime quality, must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellowish, not brown or reddish, free from excessive lint, and shall contain not less than 36 per cent of protein. It shall be designated and sold according to its protein content. Cottonseed meal with 36 per cent of protein shall be termed '36 per cent Protein Cottonseed Meal, Prime Quality', and higher grades similarly designated (as '43 per cent Protein Cottonseed Meal, Prime Quality'), etc.

2. "*Cottonseed Meal, Off Quality.* Cottonseed meal not fulfilling the above requirements as to color, odor and texture shall be graded '36 per cent Protein Cottonseed Meal, Off Quality,' and higher grades similarly designated."

The grade chiefly used this year for fertilizer has been that containing 6.58 per cent nitrogen (41 per cent protein).

One hundred and thirty-seven samples have been analyzed, most of them submitted by purchasers. Such samples should be accompanied by complete information as to manufacturer and guaranty, but in some instances this information, although requested, is not obtained. Thus thirteen samples appear in our summary without guaranties. About three-quarters of the total samples represented the 6.58 per cent nitrogen grade; there were 11 samples of the 6.88 per cent grade and 12 of the 5.75 per cent grade. The average nitrogen content for the groups in the order named was 6.60, 6.87 and 5.62 per cent.

Price quotations for the several grades, making no allowance for the phosphoric acid and potash per cent, show that nitrogen has cost 40.5 cents per pound in the 6.58 per cent meal; 40.8 cents per pound in the 5.75 per cent grade; and 40.7 cents in the 6.88 per cent grade.

Of one hundred and twenty-four samples with known guaranties, eighty substantially equalled or exceeded their guaranties and forty-four did not. That is to say that more than one-third of the samples fell below guaranty by more than 0.1 per cent of nitrogen. While purchasers are compensated by manufacturers and

jobbers for shortages by means of rebates, the necessity for this appears to arise from attempting to grade this product too closely. Reference to the group averages noted above shows that the nitrogen found in meals of the several groups barely meets the requirements in two instances and in one fails to do so.

Analyses are given in Table IV.

LINSEED MEAL.

This product is also used in tobacco fertilizer mixtures in conjunction with, or as a substitute for, cottonseed meal to supply organic nitrogen. So-called "old process" meal is made by grinding the press cake left after removal of the oil from flaxseed by crushing, cooking and pressing. In "new process" meal the oil has been removed by the use of solvents.

Nineteen samples were examined this year, all submitted by purchasers. This material is generally guaranteed 5.5 per cent nitrogen. The average nitrogen found this year is 5.5 per cent. At the average of quoted prices nitrogen from this source has cost a little more than 50 cents a pound. Last year the cost was estimated from similar data at 48 cents.

Analyses are given in Table IV.

TABLE IV. ANALYSES OF COTTONSEED AND LINSEED MEALS.

Station No.	Manufacturer or Jobber, Car No. or Mark	Purchased, Sampled or Sent by	Per cent. Nitrogen. Found.	Per cent. Nitrogen. Guaranteed.
	Apothecaries Hall Co., Waterbury, Conn.	**Cottonseed Meal.**		
1744	.....	Station agent at factory.....	6.80	6.58
827	Car No. 51081	Hatheway & Steane, Inc., Hartford	6.70	6.58
828	Car No. 50644	Hatheway & Steane, Inc., Hartford	6.58	6.58
829	Car No. 60166	Hatheway & Steane, Inc., Hartford	6.54	6.58
830	Car No. 55816	Hatheway & Steane, Inc., Hartford	6.82	6.58
831	Car No. 519348	Hatheway & Steane, Inc., Hartford	6.33	6.58
832	Car No. 174494	Hatheway & Steane, Inc., Hartford	6.32	6.58
833	Car No. 55314	Hatheway & Steane, Inc., Hartford	6.58	6.58
834	Car No. 55922	Hatheway & Steane, Inc., Hartford	6.47	6.58
835	Car No. 7415	Hatheway & Steane, Inc., Hartford	6.59	6.58
861	Car No. 58471	Hatheway & Steane, Inc., Hartford	6.14	6.58
862	Car No. 55496	Hatheway & Steane, Inc., Hartford	6.53	6.58
1209	Car No. 311306	Hatheway & Steane, Inc., Hartford	6.64	6.58
1210	Car No. 166052	Hatheway & Steane, Inc., Hartford	6.62	6.58
1211	Car No. 409603	Hatheway & Steane, Inc., Hartford	6.48	6.58
1212	Car No. 167589	Hatheway & Steane, Inc., Hartford	6.71	6.58
1213	Car No. 170331	Hatheway & Steane, Inc., Hartford	6.54	6.58
1214	Car No. 163137	Hatheway & Steane, Inc., Hartford	6.50	6.58
1262	Car No. 405457	Hatheway & Steane, Inc., Hartford	6.58	6.58
1269	Car No. 160009	Hatheway & Steane, Inc., Hartford	6.58	6.58
1502	Car No. 162958	Hatheway & Steane, Inc., Hartford	6.66	6.58

TABLE IV. ANALYSES OF COTTONSEED AND LINSEED MEALS—*Continued.*

Station No.	Manufacturer or Jobber, Car No. or Mark	Purchased, Sampled or Sent by	Per cent. Nitrogen. Found.	Per cent. Nitrogen. Guaranteed.
	Apothecaries Hall Co., Waterbury, Conn.			
1503	Car No. 162120	Hatheway & Steane, Inc., Hartford	6.53	6.58
1504	Car No. 161055	Hatheway & Steane, Inc., Hartford	6.42	6.58
1505	Car No. 47379	Hatheway & Steane, Inc., Hartford	6.72	6.58
1625	Car No. 15341	Hatheway & Steane, Inc., Hartford	6.33	6.58
8820	Car No. 156920	Hatheway & Steane, Inc., Hartford	6.66	6.58
8828	Car No. 7611	Hatheway & Steane, Inc., Hartford	6.66	6.58
8829	Car No. 158940	Hatheway & Steane, Inc., Hartford	6.73	6.58
8830	Car No. 55363	Hatheway & Steane, Inc., Hartford	6.73	6.58
	Ashcraft-Wilkinson Co., Atlanta, Ga.			
1951	Paramount	Station agent. Stock of Amos D. Bridge's Sons, Hazardville	5.65	5.76
876	Car N. H. 167451	Cullman Bros., Hartford	6.92	....
877	Car N. H. 71784	Cullman Bros., Hartford	6.05	....
878	Car N. H. 165813	Cullman Bros., Hartford	6.83	....
881	Helmet, Car L & N. 15890	Cullman Bros., Hartford	6.67	6.56
882	Helmet, Car.B. & O. 194016	Cullman Bros., Hartford	6.78	6.56
883	Helmet, Car L. & N. 14274	Cullman Bros., Hartford	6.83	6.56
884	Helmet, Car N. H. 168439	Cullman Bros., Hartford	6.74	6.56
885	Helmet, Car No. 150244	Cullman Bros., Hartford	6.56	6.56
1029	Helmet, Car N. H. 169671	Cullman Bros., Hartford	6.60	6.56
1286	Helmet, Car No. 163490	I. Kaffenburgh & Sons, Inc., Hartford	6.70	6.56
1287	Helmet, Car No. 231485	I. Kaffenburgh & Sons, Inc., Hartford	6.55	6.56
1288	Helmet, Car No. 30347	I. Kaffenburgh & Sons, Inc., Hartford	6.45	6.56
1289	Helmet, Car No. 162083	I. Kaffenburgh & Sons, Inc., Hartford	6.68	6.56
1290	Helmet, Car No. 342072	I. Kaffenburgh & Sons, Inc., Hartford	6.20	6.56
1291	Helmet, Car No. 62951	I. Kaffenburgh & Sons, Inc., Hartford	6.17	6.56
1292	Helmet, Car No. 166275	I. Kaffenburgh & Sons, Inc., Hartford	6.48	6.56

TABLE IV. ANALYSES OF COTTONSEED AND LINSEED MEALS—*Continued.*

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.			
1293	Helmet, Car No. 160890	I. Kaffenburgh & Sons, Inc., Hartford	6.59	6.56
1294	Helmet, Car C. N. 428278	I. Kaffenburgh & Sons, Inc., Hartford	6.57	6.56
1295	Car C. N. 409048	I. Kaffenburgh & Sons, Inc., Hartford	6.56	6.56
1626	Helmet, Car C. N. E. 10559	I. Kaffenburgh & Sons, Inc., Hartford	6.56	6.56
1246	Monarch, Car N. Y. 84844 and M. L. & T. 53287	Spencer Bros., Inc., Suffield	6.94	6.88
1712	Monarch, Car C. of Ga. 58030	Spencer Bros., Inc., Suffield	6.90	6.88
1713	Monarch, Car N. Y. 166393 and 25254	Spencer Bros., Inc., Suffield	7.02	6.88
1714	Helmet, Car Pa. 572583	Spencer Bros., Inc., Suffield	6.49	6.56
1715	Paramount, Car R. I. 46524	Spencer Bros., Inc., Suffield	5.32	5.76
1716	Helmet, Car W. of A. 959	Spencer Bros., Inc., Suffield	6.53	6.56
1717	Monarch, Car N. Y. 160303 and 37727	Spencer Bros., Inc., Suffield	7.08	6.88
1849	Helmet, Car I. C. 340224	Spencer Bros., Inc., Suffield	6.71	6.56
1850	Helmet, Car I. C. 159550	Spencer Bros., Inc., Suffield	6.56	6.56
1851	Monarch, Car N. Y. 163385 and INO 53564	Spencer Bros., Inc., Suffield	7.02	6.88
1852	Monarch, Car B. & O. 192375	Spencer Bros., Inc., Suffield	6.90	6.88
	F. W. Brode Corp., Memphis, Tenn.			
1916	Owl Brand 41%	Station agent. Stock of F. N. Buckland, So. Manchester	6.28	6.56
1598	Owl Brand 43%	Geo. T. Soule Co., New Milford	6.60	6.88
1770	Owl Brand 43%	Geo. T. Soule Co., New Milford	6.54	6.88
1829	Owl Brand 43%	Geo. T. Soule Co., New Milford	6.70	6.88
	Humphreys-Godwin Co., Memphis, Tenn.			
1543	Dixie	Station agent. Stock of C. S. Barnum, Danbury	6.66	6.58
1681	Dixie	Station agent. Stock of Frank Ford, Suffield	6.58	6.58
1792	Bull	Station agent. Stock of Bloomfield Farmers' Exchange, Bloomfield	6.86	6.88
1877	Danish	Station agent. Stock of Geo. S. Phelps, Thompsonville	5.78	5.75

TABLE IV. ANALYSES OF COTTONSEED AND LINSEED MEALS—*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.			
1899	Dixie	Station agent. Stock of John Richards, So. Glastonbury	6.37	6.56
1297	Dixie, Car No. 164145	J. Bermant, Ellington	6.48	6.58
1298	Dixie, Car No. 168084	J. Bermant, Ellington	6.69	6.58
1299	Dixie, Car No. 35114	J. Bermant, Ellington	6.39	6.58
1330	Bull, Car N. H. 71512	Cullman Bros., Inc., Hartford	7.02	6.88
873	Dixie, Car N. H. 169423	Cullman Bros., Inc., Hartford	6.41	6.58
874	Dixie, Car N. H. 163452	Cullman Bros., Inc., Hartford	6.58	6.58
875	Dixie, Car No. 160484	Cullman Bros., Inc., Hartford	6.45	6.58
1331	Dixie, Car N.H. 90428	Cullman Bros., Inc., Hartford	6.67	6.58
1332	Dixie, Car N. H. 160152	Cullman Bros., Inc., Hartford	6.66	6.58
1333	Dixie, Car N. H. 87398	Cullman Bros., Inc., Hartford	6.58	6.58
1334	Dixie, Car N. H. 79245	Cullman Bros., Inc., Hartford	6.54	6.58
1335	Dixie, Car N.H. 164093	Cullman Bros., Inc., Hartford	6.62	6.58
1336	Dixie, Car N. H. 158079	Cullman Bros., Inc., Hartford	6.60	6.58
1337	Dixie, Car N. H. 160898	Cullman Bros., Inc., Hartford	6.68	6.58
1338	Dixie, Car No. 162523	Cullman Bros., Inc., Hartford	6.58	6.58
1339	Dixie, Car No. 89648	Cullman Bros., Inc., Hartford	6.58	6.58
1340	Dixie, Car No. 76146	Cullman Bros., Inc., Hartford	6.59	6.58
1550		J. R. Debone, East Hartford	6.36	
980	Dixie, Car No. 62046	L. B. Haas & Co., Inc., Hartford	6.39	6.58
981	Dixie, Car No. 245109	L. B. Haas & Co., Inc., Hartford	6.83	6.58
982	Dixie, Car No. 45358	L. B. Haas & Co., Inc., Hartford	6.50	6.58
983	Dixie, Car No. 15145	L. B. Haas & Co., Inc., Hartford	6.42	6.58
984	Dixie, Car No. 165952	L. B. Haas & Co., Inc., Hartford	6.45	6.58
985	Dixie, Car No. 44183	L. B. Haas & Co., Inc., Hartford	6.32	6.58
1032	Dixie, Car No. 421771	L. B. Haas & Co., Inc., Hartford	6.52	6.58
1033	Dixie, Car No. 16441	L. B. Haas & Co., Inc., Hartford	6.44	6.58
1344	Dixie, Car No. 171241	L. B. Haas & Co., Inc., Hartford	6.57	6.58
914	Dixie	Huntington Bros., Windsor	6.42	6.58
915	Dixie	Huntington Bros., Windsor	6.61	6.58
916	Dixie	Huntington Bros., Windsor	6.46	6.58
917	Dixie	Huntington Bros., Windsor	6.46	6.58
744	Dixie	S. F. Holcomb & Son, West Granby	6.40	6.58
901	Dixie	S. F. Holcomb & Son, West Granby	6.64	6.58
1906	Dixie, Car No. 163938	Max Lavitt, Ellington	6.37	6.58
1907	Dixie, Car No. 166562	Max Lavitt, Ellington	6.59	6.58
1908	Dixie, Car No. 170190	Max Lavitt, Ellington	6.47	6.58
1284	Dixie	H. C. Nelson, West Suffield	6.58	6.58
906	Dixie, Car C. G. A. 51140	A. N. Shepard, Hartford	6.61	6.58
1897	Dixie, Car No. 1	M. Silverberg, Ellington	6.42	6.58

TABLE IV. ANALYSES OF COTTONSEED AND LINSEED MEALS—*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.			
1898	Dixie, Car No. 2	M. Silverberg, Ellington	6.46	6.58
1854	Danish, Car Southern 167164..	Spencer Bros., Inc., Suffield	5.66	5.76
2006	Danish, Car A. C. L. 50466	Spencer Bros., Inc., Suffield	5.63	5.76
2007	Danish, Car C. M. St. P. 708260	Spencer Bros., Inc., Suffield	5.70	5.76
2008	Danish, Car Southern 168634..	Spencer Bros., Inc., Suffield	5.70	5.76
2009	Danish, Car Southern 131844..	Spencer Bros., Inc., Suffield	5.66	5.76
2010	Danish, Car A. C. L. 30742 ...	Spencer Bros., Inc., Suffield	5.73	5.76
2011	Danish, Car A. C. L. 17430 ...	Spencer Bros., Inc., Suffield	5.58	5.76
1428	Car No. 1	Henry E. Wells, Warehouse Poin	6.55	....
1429	Car No. 2	Henry E. Wells, Warehouse Poin	6.65	....
1694	Dixie, Car No. 163226	L. Wetstone & Sons, Hartford .	6.44	6.58
1695	Dixie, Car No. 341534	L. Wetstone & Sons, Hartford ..	6.31	6.58
1696	Dixie, Car No. 166772	L. Wetstone & Sons, Hartford ..	6.55	6.58
1697	Dixie, Car No. 80678	L. Wetstone & Sons, Hartford ..	6.30	6.58
1698	Dixie, Car No. 81014	L. Wetstone & Sons, Hartford ..	6.40	6.58
1699	Dixie, Car S. P. 20654	L. Wetstone & Sons, Hartford ..	6.34	6.58
	International Agricultural Corp., Atlanta, Ga.			
1173	Zenith	W. S. Pinney, Suffield	6.66	6.56
	L. B. Lovitt Co., Memphis, Tenn.			
904	"Lovit" 36%, Car I. C. 190247	A. N. Shepard & Son, Hartford..	5.58	5.76
905	"Lovit" 36%, Car I. C. 173354	A. N. Shepard & Son, Hartford..	5.60	5.76
	Marianna Sales Co., Memphis, Tenn.			
1677	White Mule	Charles J. Hartz, Burnside	6.16	6.58
	Olds & Whipple, Inc., Hartford, Conn.			
1343	Car No. 161099	L. B. Haas & Co., Hartford	6.53	....
634	.....	The Hartman Tobacco Co., Hartford	6.95	....
665	.....	The Hartman Tobacco Co., Hartford	7.13	....
1690	.....	Silberman & Kahn, Hartford	6.48	....
1779	Car No. 161306	Silberman & Kahn, Hartford	6.66	....
1778	Car No. 163813	Silberman & Kahn, Hartford	6.58	....

TABLE IV. ANALYSES OF COTTONSEED AND LINSEED MEALS—*Concluded.*

Station No.	Manufacturer or Jobber, Car No. or Mark	Purchased, Sampled or Sent by	Per cent. Nitrogen. Found.	Per cent. Nitrogen. Guaranteed.
	Manufacturer Unknown.			
1549	.....	J. R. Debone, East Hartford	6.55	....
2070	.....	Karl C. Kulle, Suffield	6.43	6.56
	Archer-Daniels-Midland Co., Minneapolis, Minn.	**Linseed Meal.**		
986	Car No. 93172	L. B. Haas & Co., Inc., Hartford	5.18	5.12
1345	Car No. 170308	L. B. Haas & Co., Inc., Hartford	5.18	5.12
8833	Car No. 10432	Hatheway & Steane, Inc., Hartford	5.64	....
8822	Car No. 94653	Hatheway & Steane, Inc., Hartford	5.63	....
8823	Car No. 9027	Hatheway & Steane, Inc., Hartford	5.64	....
918	.....	Huntington Bros., Windsor	5.25	....
1703	Car No. 161946	L. Wetstone & Sons, Hartford ..	5.15	5.12
	Kellogg and Miller, Inc., Amsterdam, N. Y.			
863	Car No. 95173	Hatheway & Steane, Inc., Hartford	5.57	5.44
864	Car No. 219843	Hatheway & Steane, Inc., Hartford	5.52	5.44
940	Car No. 33185	Hatheway & Steane, Inc., Hartford	5.41	5.44
941	Car No. 254108	Hatheway & Steane, Inc., Hartford	5.48	5.44
942	Car No. 48392	Hatheway & Steane, Inc., Hartford	5.61	5.44
943	Car No. 214525	Hatheway & Steane, Inc., Hartford	5.59	5.44
944	Car No. 220918	Hatheway & Steane, Inc., Hartford	5.67	5.44
1661	Truck No. 4791	Hatheway & Steane, Inc., Hartford	5.25	5.44
1721	Car No. 169078	A. N. Shepard & Sons, Hartford	5.48	5.44
1178	Car No. 180590	Hatheway & Steane, Inc., Hartford	5.45	5.44
1179	Car No. 35447	Hatheway & Steane, Inc., Hartford	5.57	5.44
1180	Car No. 229149	Hatheway & Steane, Inc., Hartford	5.52	5.44

II. RAW MATERIALS CHIEFLY VALUABLE FOR PHOSPHORIC ACID.

PRECIPITATED BONE PHOSPHATE.

This material is a by-product obtained in the manufacture of gelatin and glue stock from bone. Bones are treated with hydrochloric acid and the acid solution then treated with lime or limestone to precipitate the phosphates. The term "precipitated phosphate" is generally used to designate the article derived from bone as here described; but it would be descriptive also of material of similar substance and quality derived from other sources. The terms "bone phosphate" or "precipitated bone phosphate" are correctly applied only to those concentrated phosphates derived from bone.

Precipitated bone phosphate is valuable for its high available phosphoric acid, the guaranty for which is generally placed at 36 or 38 per cent.

Twelve samples were examined this year, three of which were sampled by the Station Agent and the others by purchasers. Guaranties, so far as given, were met with substantial margins of safety. There were three price quotations, all $45.00 a ton, at which available phosphoric acid has cost the purchaser 5.3 cents a pound.

Analyses are given in Table V.

SUPERPHOSPHATE.

This important base material, formerly called "acid phosphate," is made by treating phosphate rock with sulphuric acid, which results in a mixture of mono-calcium phosphate and calcium sulphate or gypsum. The phosphoric acid is largely in available form and generally is guaranteed at 16 per cent.

Eighteen samples were analyzed, four of which fell below guaranties by amounts greater than 0.25 per cent. The deficiencies ranged from 0.3 to 1 per cent. The average of all samples is 16.65 per cent and the average of quoted prices is about $25.00 per ton, thus available phosphoric acid from this source has cost approximately 7.5 cents a pound this year.

Analyses are given in Table VI.

Sample 1629, Phospho Tobacco, is classed with the superphosphates, but it contains about 3 per cent less available phosphoric acid and is guaranteed accordingly.

BASIC SLAG.

Basic slag is a by-product in the manufacture of steel from phosphatic iron ores. It should contain not less than 12 per cent

of total phosphoric acid, of which not less than 80 per cent should be "available" by the Wagner method.[1]

One sample, **1956,** from stock of Apothecaries Hall Company, was analyzed. In contained 16.58 per cent of total phosphoric acid and 14.43 per cent available. The material meets the requirements for standard basic slag, but is about 0.5 per cent under the guaranty given by the seller.

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[1] Assoc. of Official Agricultural Chemists, Proc. of Oct. 1925.

TABLE V. 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.		%	%	%	%
1410	Apothecaries Hall Co., Waterbury	At factory	0.57	39.10	38.53	36.00
1879	Eastern States Farmers' Exchange, Springfield, Mass.	Frank V. Williams, Buckland	0.05	45.53	45.48	38.00
1460	Olds & Whipple, Inc., Hartford	At factory	0.25	44.40	44.15	38.00
	Sampled by Purchaser.					
945	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	0.40	39.72	39.32	36.00
946	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	0.56	40.92	40.36	36.00
1175	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	0.75	39.25	38.50	36.00
1719	Apothecaries Hall Co., Waterbury	A. N. Shepard & Son, Hartford	0.42	39.10	38.68	36.00
920	Olds & Whipple, Inc., Hartford	Huntington Bros., Windsor	0.15	46.72	46.57	38.00
2030	Olds & Whipple, Inc., Hartford	Lester Lloyd, Suffield	0.30	46.10	45.80	38.00
1688	Olds & Whipple, Inc., Hartford	Silberman & Kahn, Hartford	0.30	46.10	46.50	38.00
1774	Olds & Whipple, Inc., Hartford	Silberman & Kahn, Hartford	0.30	45.78	45.48	38.00
1702	Olds & Whipple, Inc., Hartford	L. Wetstone & Sons, Hartford	0.60	39.50	38.90	38.00

TABLE VI. ANALYSES OF SUPERPHOSPHATE (ACID PHOSPHATE).

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Phosphoric Acid.			
			Citrate Insoluble.	Total.	"Available." Found.	"Available." Guaranteed.
	Sampled by Station.		%	%	%	%
1496	American Agricultural Chemical Co., New York City	New Canaan: Clap Board Hill Farm..	0.65	17.12	16.47	16.00
1446	Apothecaries Hall Co., Waterbury	Waterbury: Templeton's Hardware Co.	1.60	17.28	15.68	16.00
1568	Armour Fertilizer Works, New York City	Stamford: F. A. Bartlett Tree Expert Co.	0.48	20.50	20.02	20.00
1576	Armour Fertilizer Works, New York City	Meriden: Raven's Hardware Co.	0.69	17.16	16.47	16.00
1585	Associated Seed Growers, New Haven	Milford: Associated Seed Growers	0.43	17.25	16.82	16.00
1373	Berkshire Chemical Co., Bridgeport	Hamden: J. A. Smith	0.15	17.21	17.06	16.00
1368	Consolidated Rendering Co., Boston, Mass.	Highwood: H. D. Peters	0.10	19.80	19.70	20.00
1600	Consolidated Rendering Co., Boston, Mass.	Wallingford: Laden Bros.	1.53	17.60	16.07	16.00
1425	Eastern States Farmers' Exchange, Springfield, Mass.	New Canaan: Hoyt's Nurseries	0.76	16.73	15.97	16.00
1500	Eastern States Farmers' Exchange, Springfield, Mass.	Southington: Julius Lewis	0.43	16.60	16.17	16.00
1475	Olds & Whipple, Inc., Hartford	So. Manchester: F. T. Blish Hardware Co.	1.40	16.40	15.00	16.00
1472	The Rogers & Hubbard Co., Portland	Sampled at factory	0.15	17.76	17.61	16.00
1398	Standard Phosphate & Acid Works, Baltimore, Md.	Southport: Geo. S. Jennings	0.58	16.15	15.57	16.00

TABLE VI. ANALYSES OF SUPERPHOSPHATE (ACID PHOSPHATE)—*Concluded.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Phosphoric Acid.			
			Citrate Insoluble.	Total.	"Available." Found.	"Available." Guaranteed.
	Sampled by Station.		%	%	%	%
1619	I. P. Thomas & Son, Philadelphia, Pa.	Hamden: Ira W. Beers	0.28	17.08	16.80	16.00
1633	Virginia-Carolina Chemical Co., New York City	New Britain: Stanley Svea Coal Co. ..	1.25	17.30	16.05	16.00
1634	Wilcox Fertilizer Co., Mystic	Sampled at factory	0.10	18.12	18.02	17.00
	Phospho Tobacco.					
1629	Virginia-Carolina Chemical Co., New York City	New Britain: Stanley Svea Coal Co. ..	0.78	13.89	13.11	13.00
	Sampled by Purchaser.					
2029	United States Guano Co., Baltimore, Md...	Suffield: Lester Lloyd	0.20	17.30	17.10	16.00

III. RAW MATERIALS CHIEFLY VALUABLE FOR POTASH.

CARBONATE OF POTASH.

This salt contains 68.2 per cent of potash (K_2O), when pure and dry, but commercial grades will contain from 60 to 65 per cent.

Twenty-five samples were examined. One sample was old stock held over from last year and had absorbed a good deal of moisture and another sample, **1433**, was low in potash, probably for the same reason. Sample **1775** was of good grade but somewhat under the guaranty given for it. All other samples were satisfactory, many exceeding 65 per cent. The average of all samples, excluding Nos. **1433** and **999**, is 65.54 per cent. Prices quoted ranged from $6.25 to $6.60 a hundred pounds, at which figures potash in a salt testing 65.5 per cent cost the purchaser from 9.5 to 10 cents a pound.

Analyses are given in Table VII.

MURIATE OF POTASH.

The grades of this material which are used for fertilizer contain from 48 to 50 per cent of actual potash (K_2O), largely as chloride. Chlorides are detrimental to tobacco of the types grown in New England and hence muriate of potash is avoided for tobacco mixtures in this State.

Ten samples were examined and all of them exceeded guaranties. The average of all samples is 50.5 per cent potash and at $52.00 a ton potash costs 5.1 cents a pound.

Analyses are given in Table VII.

SULPHATE OF POTASH.

This salt for fertilizer purposes should contain not less than 48 per cent of potash, and not more than 2.5 per cent of chlorine.[1]

Nineteen samples were analyzed. Most of them met guaranties with substantial averages. Nos. **1196** and **1458** showed shortages in potash approaching 1 per cent. The average potash content found is 49.3 per cent. Prices quoted ranged from $69.00 to $71.00 a ton and averaged $69.50, which makes the cost of potash from this source about seven cents a pound.

SULPHATE OF POTASH-MAGNESIA.

This potash salt was formerly known as "double manure salt," a name which is now practically abandoned. It is a double sulphate

[1] Assoc. of Official Agricultural Chemists, Proc. of October, 1925.

of potash and magnesia containing 25 per cent or more of potash, and is fairly free from chlorine which should not be present in excess of 2.5 per cent.[1]

"Manure salts" is a very different article seldom found in this State. This material contains 20 to 30 per cent of potash, which is chiefly in the form of chloride.

Only two samples of sulphate of potash-magnesia were analyzed this year. Both satisfied guaranties with substantial overruns.

COTTONHULL ASHES.

This material is extremely variable in composition. Most or all of this fertilizer as sold in this State is screened and remixed by the jobber handling it and some improvement has been secured as regards uniformity. However, different shipments show wide variations, and different portions of the same lot may vary considerably in composition.

Sixty samples of these ashes have been examined this year and the results are given in Table VIII.

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[1] Assoc. of Official Agricultural Chemists, Proc. of October, 1925.

TABLE VII. ANALYSES OF POTASH SALTS, ETC.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash. Found.	Potash. Guaranteed.
	Carbonate of Potash.			
	Sampled by Station.		%	%
1954	Apothecaries Hall Co., Waterbury, Conn.	Sampled at factory	66.24	60.00
1463	Olds & Whipple, Inc., Hartford, Conn.	Sampled at factory	67.49	65.00
	Sampled by Purchaser.			
1181	Apothecaries Hall Co., Waterbury, Conn., Car No. 3683	Hatheway & Steane, Inc., Hartford	61.13	60.00
1182	Apothecaries Hall Co., Waterbury, Conn., Car No. 46112	Hatheway & Steane, Inc., Hartford	64.99	60.00
1183	Apothecaries Hall Co., Waterbury Conn., Truck 1003	Hatheway & Steane, Inc., Hartford	65.10	60.00
1184	Apothecaries Hall Co., Waterbury, Conn., Car No. 48305	Hatheway & Steane, Inc., Hartford	63.87	60.00
1266	Apothecaries Hall Co., Waterbury, Conn., Car No. 400	Hatheway & Steane, Inc., Hartford	63.85	60.00
1659	Apothecaries Hall Co., Waterbury, Conn., Truck 4791	Hatheway & Steane, Inc., Hartford	64.18	60.00
1723	Apothecaries Hall Co., Waterbury, Conn., Car No. 416271	A. N. Shepard & Son, Hartford	63.10	60.00
999	Berkshire Chemical Co., Bridgeport, Conn.	James T. Burgess, Thompsonville	56.43[1]	.....
1228	Harshaw, Fuller & Goodwin, New York, Car No. 16986	American Sumatra Tobacco Co., Bloomfield	66.52	.....
1174	International Agricultural Corp., Atlanta, Ga.	W. S. Pinney, Suffield	66.18	.....
725	A. Klipstein Co., New York, Car No. 44552	American Sumatra Tobacco Co., Bloomfield	66.43	.....
726	A. Klipstein Co., New York, Car No. 165034	American Sumatra Tobacco Co., Bloomfield	65.53	.....
727	A. Klipstein Co., New York, Car No. 62255	American Sumatra Tobacco Co., Bloomfield	67.42	.....
729	A. Klipstein Co., New York, Car No. 342273	American Sumatra Tobacco Co., Bloomfield	66.97	.....
730	A. Klipstein Co., New York, Car No. 415088	American Sumatra Tobacco Co., Bloomfield	66.09	.....

[1]Moisture, 16.20%. Last year's stock.

TABLE VII. ANALYSES OF POTASH SALTS, ETC.—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash.	
			Found.	Guaranteed.
	Carbonate of Potash. *Sampled by Purchaser.*		%	%
893	A. Klipstein Co., New York, Car No. 71236	American Sumatra Tobacco Co., Bloomfield	66.22	.....
894	A. Klipstein Co., New York, Car No. 571483	American Sumatra Tobacco Co., Bloomfield	67.29	.....
1226	A. Klipstein Co., New York, Car No. 23995	American Sumatra Tobacco Co., Bloomfield	65.94	.....
1227	A. Klipstein Co., New York, Car No. 19569	American Sumatra Tobacco Co., Bloomfield	65.56	.....
1229	A. Klipstein Co., New York, Car No. 85658	American Sumatra Tobacco Co., Bloomfield	66.12	.....
1775	Olds & Whipple, Inc., Hartford, Conn., Car N. H. 150075	Silberman & Kahn, Hartford	63.24	65.00
1685	Olds & Whipple, Inc., Hartford, Conn.	Silberman & Kahn, Hartford	60.20	65.00
1433	Manufacturer unknown	P. J. Anderson, Windsor	58.90	.....
	Muriate of Potash. *Sampled by Station.*			
1738	American Agricultural Chemical Co., New York	Sampled at factory, West Haven	51.78	50.00
1413	Apothecaries Hall Co., Waterbury, Conn.	Sampled at factory	51.64	50.00
1565	Armour Fertilizer Works, New York	F. A. Bartlett Tree Expert Co., Stamford	50.50	48.00
1394	Berkshire Chemical Co., Bridgeport, Conn.	Sampled at factory	50.20	50.00
1670	Berkshire Chemical Co., Bridgeport, Conn.	Knowles-Lombard Co., Guilford	50.65	50.00
1370	Consolidated Rendering Co., Boston, Mass.	H. D. Peters, Highwood	51.88	50.00
2158	Eastern States Farmers' Exchange, Springfield, Mass.	F. W. Wooding, North Haven	48.46	48.00
1608	Standard Phosphate & Acid Works, Baltimore, Md.	Julius Lewis, Southington	48.18	48.00

TABLE VII. ANALYSES OF POTASH SALTS, ETC.—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash. Found.	Potash. Guaranteed.
	Muriate of Potash.			
	Sampled by Station.		%	%
1917	I. P. Thomas & Son, Philadelphia, Pa.	J. C. Thompson, Unionville	50.40	50.00
1635	Wilcox Fertilizer Co., Mystic, Conn.	Sampled at factory	51.70	50.00
	Sulphate of Potash.			
	Sampled by Station.			
1734	American Agricultural Chemical Co., New York	E. J. Bantle, Glastonbury	49.59	48.00
1758	Apothecaries Hall Co., Waterbury, Conn.	Sampled at factory	50.72	48.00
2148	Armour Fertilizer Works, New York	James T. Caffrey, Cromwell	49.53	48.00
1393	Berkshire Chemical Co., Bridgeport, Conn.	Sampled at factory	49.05	48.00
1422	Consolidated Rendering Co., Boston, Mass.	L. T. Frisbie Co., New Haven	49.87	48.00
1880	Eastern States Farmers' Exchange, Springfield, Mass.	Frank V. Williams, Buckland	49.46	48.00
1458	Olds & Whipple, Inc., Hartford, Conn.	Sampled at factory	47.80	48.65
	Sampled by Purchaser.			
1185	Apothecaries Hall Co., Waterbury, Conn., Truck 1002	Hatheway & Steane, Inc., Hartford	49.54	48.00
1186	Apothecaries Hall Co., Waterbury, Conn., Car No. 5430	Hatheway & Steane, Inc., Hartford	47.14	48.00
1267	Apothecaries Hall Co., Waterbury, Conn., Car No. 402	Hatheway & Steane, Inc., Hartford	48.33	48.00
1658	Apothecaries Hall Co., Waterbury, Conn., Truck 4791	Hatheway & Steane, Inc., Hartford	48.56	48.00
1727	Apothecaries Hall Co., Waterbury, Conn., Car No. 166056	A. N. Shepard & Son, Hartford	48.98	48.00

TABLE VII. ANALYSES OF POTASH SALTS, ETC.—*Concluded.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Potash.	
			Found.	Guaranteed.
	Sulphate of Potash. *Sampled by Purchaser.*		%	%
997	Berkshire Chemical Co., Bridgeport, Conn.	James T. Burgess, Thompsonville	49.10	48.00
1986	Berkshire Chemical Co., Bridgeport, Conn.	V. L. Hickey, Burnside	49.25	48.00
728	Harshaw, Fuller & Goodwin, New York, Car No. 184770	American Sumatra Tobacco Co., Bloomfield	50.56	.....
2028	Olds & Whipple, Inc., Hartford, Conn.	Lester Lloyd, Suffield	51.33	48.65
1686	Olds & Whipple, Inc., Hartford, Conn.	Silberman & Kahn, Hartford	48.43	48.65
1777	Olds & Whipple, Inc., Hartford, Conn., Car N. H. 150075	Silberman & Kahn, Hartford	49.60	48.65
1700	Olds & Whipple, Inc., Hartford, Conn.	L. Wetstone & Sons, Hartford	49.73	48.65
	Sulphate of Potash and Magnesia. *Sampled by Station.*			
1408	Apothecaries Hall Co., Waterbury, Conn.	Sampled at factory	27.25	26.00
1968	Eastern States Farmers' Exchange, Springfield, Mass.	Paul W. Caldwell, New Milford	27.71	25.00

TABLE VIII. ANALYSES OF COTTON HULL ASHES.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Moisture.	Phosphoric Acid.	Potash.
	Sampled by Station.		%	%	%
9852	Ed. Eggert, Hartford, Conn., Car Rock Island 57595 ...	American Agricultural Chemical Co., West Haven	15.77	2.55	14.65
9888	Ed. Eggert, Hartford, Conn., Car N. H. 166696	American Agricultural Chemical Co., West Haven	18.45	2.57	18.77
9889	Ed. Eggert, Hartford, Conn., Car S. L. S. F. 147205 ...	American Agricultural Chemical Co., West Haven	22.45	2.67	15.60
9890	Ed. Eggert, Hartford, Conn., Car A. T. & S. F. 46228 ..	American Agricultural Chemical Co., West Haven	19.25	4.77	23.69
303	Ed. Eggert, Hartford, Conn., Lot No. 1	L. B. Haas & Co., Hartford	12.13	2.98	31.92
304	Ed. Eggert, Hartford, Conn., Lot No. 2	L. B. Haas & Co., Hartford	13.20	4.71	29.13
407	Ed. Eggert, Hartford, Conn.	L. B. Haas & Co., Hartford	14.33	4.26	27.95
1945	Ed. Eggert, Hartford, Conn.	G. A. Peckham, Suffield	.....	3.14	31.84
1324	Ed. Eggert, Hartford, Conn.	J. E. Shepard, So. Windsor	.....	....	22.34
1322	International Agricultural Corp., Boston, Mass.	J. E. Shepard, So. Windsor	.....	2.44	32.46
1323	International Agricultural Corp., Boston, Mass.	J. E. Shepard, So. Windsor	.....	2.45	32.37
	Sampled by Purchaser.				
2077	F. W. Brode Corp., Memphis, Tenn., Car No. 37614 ...	The Otee Tobacco Corp., Hartford	.....	2.65	21.18
2114	F. W. Brode Corp., Memphis, Tenn., Car No. 128835 ..	The Otee Tobacco Corp., Hartford	.....	2.73	31.15
2115	F. W. Brode Corp., Memphis, Tenn., Car No. 28161 ...	The Otee Tobacco Corp., Hartford	.....	1.83	15.47
2139	F. W. Brode Corp., Memphis, Tenn., Car No. 46481 ...	The Otee Tobacco Corp., Hartford	.....	3.65	25.95
2112	F. W. Brode Corp., Memphis, Tenn., Car No. 156794 ..	J. B. Stewart, Windsor	.....	2.94	27.04

TABLE VIII. ANALYSES OF COTTON HULL ASHES—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Moisture.	Phosphoric Acid.	Potash.
	Sampled by Purchaser.		%	%	%
2113	F. W. Brode Corp., Memphis, Tenn., Car No. 204733 ..	J. B. Stewart, Windsor	.....	3.64	19.65
2117	F. W. Brode Corp., Memphis, Tenn., Car No. 43268 ...	J. B. Stewart, Windsor	.....	3.12[1]	20.36
1679	Ed. Eggert, Hartford, Conn., Car No. 46021	American Sumatra Tobacco Co., Bloomfield	.....	3.45	25.00
408	Ed. Eggert, Hartford, Conn., Car C. M. & St. Paul 711241	P. J. Anderson, Windsor	14.98	2.93	12.03
409	Ed. Eggert, Hartford, Conn., Car C. M. & St. Paul 711241	P. J. Anderson, Windsor	3.22	1.47	3.68
461	Ed. Eggert, Hartford, Conn., Car S. F. 148880	P. J. Anderson, Windsor	6.48	....	34.98
635	Ed. Eggert, Hartford, Conn., Car St. L. 129233	P. J. Anderson, Windsor	.....	....	36.14
636	Ed. Eggert, Hartford, Conn., Car R. I. 133611	P. J. Anderson, Windsor	.....	....	35.74
637	Ed. Eggert, Hartford, Conn., Car C. R. I. & P. 156134..	P. J. Anderson, Windsor	.....	....	37.34
638	Ed. Eggert, Hartford, Conn., Car R. I. 57845	P. J. Anderson, Windsor	.....	....	32.60
639	Ed. Eggert, Hartford, Conn., Car St. L. 161328	P. J. Anderson, Windsor	.....	....	31.45
640	Ed. Eggert, Hartford, Conn., Car Frisco 122879	P. J. Anderson, Windsor	.....	....	37.42
693	Ed. Eggert, Hartford, Conn., Car R. I. 350135	Edwards & Brewer, Hartford	8.75	3.51	25.08
694	Ed. Eggert, Hartford, Conn., Car R. I. 350228	Edwards & Brewer, Hartford	12.08	4.45	28.58
695	Ed. Eggert, Hartford, Conn., Car S. L. & S. F. 129344..	Edwards & Brewer, Hartford	10.71	3.48	28.04
696	Ed. Eggert, Hartford, Conn., Car S. L. & S. F. 128712..	Edwards & Brewer, Hartford	12.05	4.20	27.64
993	Ed. Eggert, Hartford, Conn., Car M. O. P. 31613	Edwards & Brewer, Hartford	.....	2.97	22.52
1240	Ed. Eggert, Hartford, Conn., Car R. I. 46687	Edwards & Brewer, Hartford	.....	3.52	23.62
1241	Ed. Eggert, Hartford, Conn., Car R. I. 46687	Edwards & Brewer, Hartford	.....	2.68	21.54

[1] Moisture 14.4%.

TABLE VIII. ANALYSES OF COTTON HULL ASHES—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Moisture.	Phosphoric Acid.	Potash.
	Sampled by Purchaser.		%	%	%
1596	Ed. Eggert, Hartford, Conn., Car H. 46687	Edwards & Brewer, Hartford	.....	2.33	33.98
1597	Ed. Eggert, Hartford, Conn., Car S. L. & S. F. 122837	Edwards & Brewer, Hartford	.....	3.23	24.78
1753	Ed. Eggert, Hartford, Conn., Car CRIP 3299	Edwards & Brewer, Hartford	.....	3.38	25.39
2023	Ed. Eggert, Hartford, Conn., Lot XX	Edwards & Brewer, Hartford	.....	2.95	33.08
2024	Ed. Eggert, Hartford, Conn., Lot No. 100	Edwards & Brewer, Hartford	.....	4.20	21.65
229	Ed. Eggert, Hartford, Conn., Car No. R. I. 350228	Ed. Eggert, Hartford	12.65	4.24	27.84
230	Ed. Eggert, Hartford, Conn., Car No. St. L. & S. F. 128712	Ed. Eggert, Hartford	10.03	4.06	28.08
231	Ed. Eggert, Hartford, Conn., Car No. 31613	Ed. Eggert, Hartford	9.78	3.19	22.74
747	Ed. Eggert, Hartford, Conn., Lot No. 8	Ed. Eggert, Hartford	.....	2.59	32.04
953	Ed. Eggert, Hartford, Conn., Truck 5430	Hatheway & Steane, Inc., Hartford	.....	4.27	25.20
1176	Ed. Eggert, Hartford, Conn., Truck No. 3	Hatheway & Steane, Inc., Hartford	.....	4.18	26.94
1177	Ed. Eggert, Hartford, Conn., Car No. 37-989	Hatheway & Steane, Inc., Hartford	.....	4.26	28.25
1624	Ed. Eggert, Hartford, Conn., Car 5-203	Hatheway & Steane, Inc., Hartford	.....	4.20	25.58
1726	Ed. Eggert, Hartford, Conn.	A. N. Shepard & Son, Hartford	.....	2.24	28.51
2040	Ed. Eggert, Hartford, Conn.	A. N. Shepard & Son, Hartford	.....	2.08	27.50
1485	Ed. Eggert, Hartford, Conn.	J. E. Shepard, So. Windsor	.....	4.48	22.17
1486	Ed. Eggert, Hartford, Conn.	J. E. Shepard, So. Windsor	.....	4.38	22.05
1771	Ed. Eggert, Hartford, Conn.	Spencer Bros., Inc., Suffield	.....	3.41	12.89
994	International Agricultural Corp., Boston, Mass. Car D. & H. 20826	J. E. Shepard, So. Windsor	.....	2.88	33.66

TABLE VIII. ANALYSES OF COTTON HULL ASHES—*Concluded.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Moisture.	Phosphoric Acid.	Potash.
	Sampled by Purchaser.		%	%	%
995	International Agricultural Corp., Boston, Mass., Car B. & M. 68094	J. E. Shepard, So. Windsor	.....	2.76	36.34
1701	Olds & Whipple, Inc., Hartford, Conn., Car No. 169164	L. Wetstone & Sons, Hartford	.....	2.38	23.09
2016	Ed. Eggert, Hartford, Conn., Car S. L. & S. F. 121723[1]	Edwards & Brewer, Hartford	.....	1.30	8.35
2017	Ed. Eggert, Hartford, Conn., Car S. F. 147051[1]	Edwards & Brewer, Hartford	.....	1.75	8.35
2004	Manufacturer unknown	Meyer & Mendelsohn, Inc., Hartford	.....	3.38	17.79
820	Manufacturer unknown	American Sumatra Tobacco Co., Bloomfield	.....	2.32	40.16

[1] Bought for low grade ashes.

IV. RAW MATERIALS CONTAINING NITROGEN AND POTASH.

NITRATE OF POTASH AND NITRATE OF POTASH-SODA.

Potassium nitrate (salt peter), occurs naturally in small deposits in various parts of the world. It is also manufactured from nitrate of soda and muriate of potash. The salt should contain not less than 12 per cent of nitrogen and not less than 44 per cent of potash.

Nitrate of soda-potash is a mixture of about ¾ nitrate of soda and ¼ nitrate of potash. It occurs in Chile and yields about 14 per cent of nitrogen and 10 per cent or more of potash.

Both of these salts are used to some extent in mixtures for tobacco. Eight samples of potassium nitrate and three of nitrate of potash-soda were examined this year. All were of good grade and fully met guaranties in both elements of plant food.

Analyses are given in Table IX.

TABLE IX. ANALYSES OF NITRATE OF POTASH, ETC.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Nitrogen.		Equivalent to Ammonia.		Potash.	
			Found.	Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.
	Nitrate of Potash.							
	Sampled by Station.		%	%	%	%	%	%
1969	Eastern States Farmers' Exchange, Springfield, Mass.	Paul W. Caldwell, New Milford	13.24	13.00	16.10	15.79	44.31	44.00
1459	Olds & Whipple, Inc., Hartford	Sampled at factory	13.28	12.55	16.15	15.00	45.65	44.00
1903	Synthetic Nitrogen Products Co., New York	John Richards, So. Glastonbury	13.28	13.00	16.15	15.70	44.50	44.00
	Sampled by Purchaser.							
1329	Berkshire Chemical Co., Bridgeport, Conn., Car N. H. 171354	Cullman Bros., Hartford	14.22	.....	17.29	.....	43.09	.....
1892	Eastern States Farmers' Exchange, Springfield, Mass.	Donald J. Grant, Buckland	14.16	13.00	17.22	15.79	46.43	44.00
919	Olds & Whipple, Inc., Hartford	Huntington Bros., Windsor	13.16	12.55	16.00	15.00	45.81	44.00
1684	Olds & Whipple, Inc., Hartford	Silberman & Kahn, Hartford	13.26	12.55	16.12	15.00	45.40	44.00
1776	Olds & Whipple, Inc., Hartford	Silberman & Kahn, Hartford	13.16	12.55	16.00	15.00	45.61	44.00
	Nitrate of Soda and Potash.							
	Sampled by Station.							
1411	Apothecaries Hall Co., Waterbury	Sampled at factory	14.86	14.80	18.07	18.00	14.55	10.00
988	W. R. Grace & Co., New York Car No. 65037	L. B. Haas & Co., Hartford	14.40	.....	17.51	.....	16.55	.....
1992	Wilcox Fertilizer Co., Mystic	J. R. Haley, Groton	15.06	14.80	18.31	18.00	12.25	12.00

V. RAW MATERIAL CONTAINING NITROGEN AND PHOSPHORIC ACID.

DRY GROUND FISH.

Dry ground fish, also known as fish scrap and fish tankage, is made from non-edible fish and offal from fish canneries. Oil is removed by steaming and pressing and the residue is then dried and ground. Fish may also be acidulated to prevent decomposition.

Fish scrap is generally sold on a guaranty of 8.20 per cent of nitrogen and 5 to 6 per cent of phosphoric acid. The nitrogen is organic and fairly valued at 45 to 47 cents a pound this year.

Last year a considerable quantity of fish scrap, in which inorganic nitrogen was largely substituted for fish nitrogen, came into this State. Examination of all samples this year has failed to show any evidence of adulteration of this sort. Although microscopically a number of samples were found to contain crystals of ammonium sulphate, the amounts did not appear to be considerable, and determinations of ammonia nitrogen did not show significant quantities. In two samples considerably decomposed, somewhat more than 1 per cent of nitrogen as ammonia was found, but no evidence of ammonium sulphate was found by microscopic examination. We have not found ammonium sulphate this year in any quantity which could not reasonably be explained on the basis of accidental contamination.

Another substance which we have noted in a considerable number of cases is superphosphate. The explanation given us is that the nitrogen content of fish is sometimes standardized by means of the addition of superphosphate. While it might be argued that a mixture of dry ground fish and superphosphate is not dry ground fish, nevertheless such an addition does not lessen the value of the material provided the nitrogen guaranty is met. The almost uniform guaranty of 8.22 per cent nitrogen suggests that the product is standardized by some means. There appeared to be no excessive amounts of superphosphate in the samples examined and moreover those samples showing deficiencies in nitrogen were not always identical with those containing superphosphate. In some cases samples showing less than the guaranteed amount of nitrogen showed no evidence of superphosphate; and in other cases where superphosphate was present the nitrogen found was considerable above that guaranteed.

Thirty-eight samples were examined this year. If we accept 47 cents a pound as a fair valuation for the nitrogen in fish, then commercial deficiencies greater than $1.00 a ton (equivalent to a shortage of 0.11 per cent in nitrogen), are shown in samples **1259, 1878, 1257** and **987**. Four other samples submitted without guar-

anties are also considerably deficient if the usual guaranty of 8.22 per cent nitrogen is assumed. In these calculations overages, if any, in phosphoric acid are not considered.

Analyses are given in Table X.

TANKAGE.

This raw material is derived from refuse meat and bone. The refuse is treated with steam and then pressed to remove fat, after which the residue is dried and ground.

The composition of tankage with respect to nitrogen and phosphoric acid will depend upon the nature of the material; if meat predominates, nitrogen will be high and phosphoric acid relatively low, while the reverse will be true if there is a considerable excess of bone present.

Of the eleven samples examined this year Nos. 1407 and 1424 are essentially bone tankages as indicated by both analyses and guaranties. Four samples, 1760, 1972, 1607 and 1996 were considerably deficient in nitrogen. Of these, 1760 1972 and 1607 also were low in phosphoric acid.

Analyses are given in Table XI.

GROUND BONE.

Raw bone meal or raw ground bone is the product made by drying and grinding animal bones which have not been previously steamed under pressure.

Steamed bone meal or steamed ground bone is the product made by steaming bones under pressure, after which they are dried and ground.

Steamed bone will contain considerably less nitrogen than raw bone.

Thirty-five samples were examined and so far as guaranties were given, there were only two deficiencies in nitrogen and two in phosphoric acid. The nitrogen shortages were both less than 0.2 per cent and, in general, the character of this material this year was very satisfactory. Last year a number of samples of bone were found to contain notable quantities of inorganic ammoniates, or mineral phosphates, or both, but in only four samples this year was any evidence of these materials found and in no case were the amounts considerable.

Analyses are given in Table XII.

TABLE X. ANALYSES OF DRY GROUND FISH.

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Nitrogen		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Station No.
			Total found.	Total guaranteed.		Total found.	Total guaranteed.	
	Sampled by Station.		%	%	%	%	%	
1499	American Agricultural Chemical Co., New York City	F. S. Bidwell Co., Windsor Locks	8.12	8.23	9.87	18.55	6.00	1499
1957	Apothecaries Hall Co., Waterbury	Jos. P. Norton, Broad Brook	9.61	8.20	11.68	6.26	5.00	1957
1259	Berkshire Chemical Co., Bridgeport	L. B. Haas & Co., Hartford	7.86	8.22	9.56	6.77	6.00	1259
1878	Eastern States Farmers' Exchange, Springfield, Mass.	Frank V. Williams, Buckland	7.39	9.00	8.98	6.91	6.90	1878
1468	Olds & Whipple, Inc., Hartford	Sampled at factory	9.28	8.23	11.28	7.65	5.00	1468
1610	Standard Phosphate & Acid Works, Baltimore, Md.	E. O. Chapman, No. Haven	8.66	8.22	10.53	6.68	6.00	1610
1257	Wilcox Fertilizer Co., Mystic	J. E. Shepard, So. Windsor	8.03	8.23	9.76	6.67	6.00	1257
	Sampled by Purchaser.							
821	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	9.73	8.20	11.83	6.66	5.00	821
858	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	9.86	8.20	11.99	7.46	5.00	858
859	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	9.94	8.20	12.09	7.16	5.00	859
1270	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	10.03	8.20	12.19	6.76	5.00	1270
1656	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	9.19	8.20	11.17	6.71	5.00	1656
1261	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford	9.92	8.20	12.06	7.41	5.00	1261
1725	Apothecaries Hall Co., Waterbury	A. N. Shepard & Son, Hartford	9.18	8.20	11.16	6.98	5.00	1725

TABLE X. ANALYSES OF DRY GROUND FISH—*Continued.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Nitrogen. Total found.	Nitrogen. Total guaranteed.	Ammonia equivalent to total nitrogen.	Phosphoric Acid. Total found.	Phosphoric Acid. Total guaranteed.	Station No.
	Sampled by Purchaser.		%	%	%	%	%	
737	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	7.80	8.22	9.48	6.80	6.00	737
738	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.70	8.22	10.58	7.11	6.00	738
739	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.26	8.22	10.04	6.76	6.00	739
740	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.13	8.22	9.88	6.88	6.00	740
741	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	7.96	8.22	9.68	7.16	6.00	741
758	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	7.97	8.22	9.69	6.95	6.00	758
759	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.22	8.22	9.99	7.14	6.00	759
760	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.17	8.22	9.93	6.37	6.00	760
761	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.67	8.22	10.54	6.84	6.00	761
762	Berkshire Chemical Co., Bridgeport	American Sumatra Tobacco Co., Bloomfield	8.54	8.22	10.38	6.02	6.00	762

TABLE X. ANALYSES OF DRY GROUND FISH—*Concluded.*

Station No.	Manufacturer or Wholesale Dealer.	Dealer or Purchaser.	Nitrogen.		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Station No.
			Total found.	Total guaranteed.		Total found.	Total guaranteed.	
	Sampled by Purchaser.		%	%	%	%	%	
996	Berkshire Chemical Co., Bridgeport	James T. Burgess, Thompsonville ..	8.63	8.22	10.49	5.96	6.00	996
880	Berkshire Chemical Co., Bridgeport	Cullman Bros., Hartford	9.46	8.22	11.50	7.60	6.00	880
1030	Berkshire Chemical Co., Bridgeport	Cullman Bros., Hartford	9.42	9.46	11.45	7.11	6.00	1030
1031	Berkshire Chemical Co., Bridgeport	Cullman Bros., Hartford	9.40	9.46	11.43	7.18	6.00	1031
987	Berkshire Chemical Co., Bridgeport	L. B. Haas & Co., Inc., Hartford ...	8.02	8.22	9.75	6.44	6.00	987
1342	Berkshire Chemical Co., Bridgeport	L. B. Haas & Co., Inc., Hartford ...	8.72	8.22	10.60	6.39	6.00	1342
921	Olds & Whipple, Inc., Hartford	Huntington Bros., Windsor	8.65	8.23	10.52	6.30	5.00	921
1689	Olds & Whipple, Inc., Hartford	Silberman & Kahn, Hartford	9.74	8.23	11.84	8.00	5.00	1689
1781	Olds & Whipple, Inc., Hartford	Silberman & Kahn, Hartford	9.68	8.23	11.77	7.85	5.00	1781
1705	Olds & Whipple, Inc., Hartford	L. Wetstone & Sons, Hartford	8.62	8.23	10.48	8.25	5.00	1705
1706	Olds & Whipple, Inc., Hartford	L. Wetstone & Sons, Hartford	8.14	8.23	9.90	8.23	5.00	1706
1891	Wilcox Fertilizer Co., Mystic	V. L. Hickey, Burnside	8.19	8.22	9.96	7.30	6.00	1891
899	Wilcox Fertilizer Co., Mystic	J. E. Shepard, So. Windsor	8.29	8.22	10.08	6.72	6.00	899
900	Wilcox Fertilizer Co., Mystic	J. E. Shepard, So. Windsor	8.05	8.22	9.79	7.21	6.00	900

TABLE XI. ANALYSES OF TANKAGE.

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen.		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
			Total found.	Total guaranteed.		Total found.	Total guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
	Sampled by Station.		%	%	%	%	%	%	%	
1407	Apothecaries Hall Co., Waterbury ..	J. A. Glasnapp, West Cheshire ..	3.75	3.29	4.56	20.60	20.00	53.5	46.5	1407
1569	Apothecaries Hall Co., Waterbury ..	J. B. McArdle, Greenwich	7.48	7.40	9.09	11.45	3.00	43.5	56.5	1569
1760	Armour Fertilizer Works, New York City	A. R. Jones, Wallingford	6.94	7.40	8.44	5.59	6.87	38.0	62.0	1760
1372	Berkshire Chemical Co., Bridgeport..	J. A. Smith, Hamden	7.76	7.40	9.43	7.65	6.86	40.5	59.5	1372
1424	Conn. Fat Rendering & Fertilizer Corp., New Haven	Sampled at factory	3.60	3.29	4.38	21.80	.....	41.0	59.0	1424
1371	Consolidated Rendering Co., Boston, Mass.	H. D. Peters, Highwood	7.84	7.41	9.53	10.64	9.15	33.0	67.0	1371
1421	Consolidated Rendering Co., Boston, Mass.	L. T. Frisbie Co., New Haven ..	5.18	4.92	6.30	16.14	14.00	35.5	64.5	1421
1972	Eastern States Farmers' Exchange Springfield, Mass.	Harold Brundage, Danbury	7.18	7.50	8.73	8.75	9.20	34.0	66.0	1972
1396	Standard Phosphate & Acid Works, Baltimore, Md.	Geo. S Jennings, Southport	7.46	7.40	9.07	4.98	.....	26.5	73.5	1396
1607	Standard Phosphate & Acid Works, Baltimore, Md.	Julius Lewis, Southington	6.60	7.40	8.02	7.78	9.15	29.5	70.5	1607
1996	Standard Phosphate & Acid Works, Baltimore, Md.	Rand & Christensen, Wilson	7.88	8.22	9.58	4.66	4.57	25.5	74.5	1996

TABLE XII. ANALYSES OF GROUND BONE.

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen.		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
			Total found.	Total guaranteed.		Total found.	Total guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
	Sampled by Station.		%	%	%	%	%	%	%	
1390	American Agricultural Chemical Co., New York City	S. P. Strople, New Britain	2.48	2.47	3.02	25.95	22.88	43.5	56.5	1390
1412	Apothecaries Hall Co., Waterbury	Sampled at factory	3.64	3.29	4.43	23.25	20.00	50.5	49.5	1412
1447	Apothecaries Hall Co., Waterbury	Templeton Hardware Co., Waterbury	2.78	2.46	3.38	24.18	22.00	59.0	41.0	1447
1562	Armour Fertilizer Works, New York City	Raven's Hardware Co., Meriden	2.51	2.47	3.05	23.45	22.00	65.5	34.5	1562
1395	Berkshire Chemical Co., Bridgeport	C. Buckingham & Co., Southport	1.95	2.06	2.37	26.85	23.00	50.5	49.5	1395
1420	Consolidated Rendering Co., Boston, Mass.	Lightbourn & Pond Co., New Haven	3.86	2.46	4.69	21.18	22.90	33.0	67.0	1420
1962	Eastern States Farmers' Exchange, Springfield, Mass.	Hoyt's Nurseries, New Canaan	2.59	2.50	3.15	26.60	23.00	59.5	40.5	1962
1467	Olds & Whipple, Inc., Hartford	Rackliffe Bros. Co., New Britain	2.84	2.50	3.45	22.80	22.00	61.5	38.5	1467
1901	Olds & Whipple, Inc., Hartford	John Richards, So. Glastonbury	2.74	2.50	3.33	24.42	22.00	60.5	39.5	1901
1537	The Rogers & Hubbard Co., Portland	Cadwell & Jones, Hartford	3.45	3.29	4.19	20.00	20.50	52.0	48.0	1537
1538	The Rogers & Hubbard Co., Portland	Cadwell & Jones, Hartford	3.52	3.69	4.28	26.60	24.70	70.5	29.5	1538
1923	The Rogers & Hubbard Co., Portland	Sampled at factory	3.86	3.69	4.69	25.85	24.70	73.0	27.0	1923
1644	M. L. Shoemaker & Co., Philadelphia, Pa.	Geo. T. Soule Co., New Milford	4.00	3.69	4.86	21.58	21.51	34.0	66.0	1644

TABLE XII. ANALYSES OF GROUND BONE—*Continued.*

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen. Total found.	Nitrogen. Total guaranteed.	Ammonia equivalent to total nitrogen.	Phosphoric Acid. Total found.	Phosphoric Acid. Total guaranteed.	Mechanical Analysis. Finer than 1–50 inch.	Mechanical Analysis. Coarser than 1–50 inch.	Station No.
	Sampled by Station.		%	%	%	%	%	%	%	
1601	Standard Phosphate & Acid Works, Baltimore, Md.	Eldridge Hardware Co., Norwich	3.39	2.47	4.12	26.97	22.00	31.5	68.5	1601
2001	Standard Phosphate & Acid Works, Baltimore, Md.	Morris L. Burr, Southport	3.42	3.30	4.16	25.67	18.30	30.5	69.5	2001
1631	Virginia-Carolina Chemical Co., New York City	Stanley Svea Coal Co., New Britain	2.52	2.47	3.06	22.50	22.50	69.5	30.5	1631
1616	I. P. Thomas & Son, Philadelphia, Pa.	W. S. Eaton, Plainville	2.49	2.45	3.03	23.40	23.00	59.5	40.5	1616
1642	Wilcox Fertilizer Co., Mystic	Sampled at factory	2.68	2.46	3.26	25.35	22.00	77.0	23.0	1642
	Sampled by Purchaser.									
860	Apothecaries Hall Co., Waterbury	Hatheway & Steane, Inc., Hartford								
1215	Apothecaries Hall Co., Waterbury, Car No. 161901	Hatheway & Steane, Inc., Hartford	4.39	....	5.34	21.86	.....	....	....	860
1263	Apothecaries Hall Co., Waterbury, Car No. 405	Hatheway & Steane, Inc., Hartford	2.99	....	3.64	26.00	.....	....	....	1215
1264	Apothecaries Hall Co., Waterbury, Car No. 81547	Hatheway & Steane, Inc., Hartford	4.39	....	5.34	22.16	.....	60.4	39.6	1264
			4.00	3.29	4.86	21.50	20.00	41.8	58.2	1263

TABLE XII. ANALYSES OF GROUND BONE—*Continued.*

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen.		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
			Total found.	Total guaranteed.		Total found.	Total guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
	Sampled by Purchaser.		%	%	%	%	%	%	%	
1265	Apothecaries Hall Co., Waterbury, Car No. 168414	Hatheway & Steane, Inc., Hartford	5.05	....	6.14	19.76	.....	31.9	68.1	1265
1660	Apothecaries Hall Co., Waterbury, Truck 4791	Hatheway & Steane, Inc., Hartford	4.23	....	5.14	22.14	.....	63.2	36.8	1660
1724	Apothecaries Hall Co., Waterbury, Car No. 169078	A. N. Shepard & Son, Hartford	3.74	....	4.55	21.22	.....	39.5	60.5	1724
1000	Berkshire Fertilizer Co., Bridgeport	James T. Burgess, Thompsonville	2.21	2.06	2.69	28.12	23.00	....	....	1000
1773	L. T. Frisbie Co., New Haven	Allen H. Treat, Hudson, N. Y.	3.76	....	4.57	22.90	.....	....	....	1773
657	Harshaw, Fuller, Goodwin Co., New York, Car No. 163619	American Sumatra Tobacco Co., Bloomfield	2.75	....	3.34	24.84	.....	....	.. .	657
658	Harshaw, Fuller, Goodwin Co., New York, Car No. 160305	American Sumatra Tobacco Co., Bloomfield	2.89	....	3.51	24.98	.....	....	....	658
685	Harshaw, Fuller, Goodwin Co., New York, Car No. 425345	American Sumatra Tobacco Co., Bloomfield	2.64	....	3.21	25.94	.....	....	....	685
686	Harshaw, Fuller, Goodwin Co., New York, Car No. 78208	American Sumatra Tobacco Co., Bloomfield	2.66	....	3.23	25.08	.....	....	....	686
764	Harshaw, Fuller, Goodwin Co., New York, Car No. 23344	American Sumatra Tobacco Co., Bloomfield	2.79	....	3.39	25.56	.....	....	....	764

TABLE XII. ANALYSES OF GROUND BONE—*Concluded.*

Station No.	Manufacturer.	Dealer or Purchaser.	Nitrogen.		Ammonia equivalent to total nitrogen.	Phosphoric Acid.		Mechanical Analysis.		Station No.
			Total found.	Total guaranteed.		Total found.	Total guaranteed.	Finer than 1–50 inch.	Coarser than 1–50 inch.	
	Sampled by Purchaser.		%	%	%	%	%	%	%	
765	Harshaw, Fuller, Goodwin Co., New York, Car No. 3989	American Sumatra Tobacco Co., Bloomfield	3.15	....	3.83	25.02	.....	....	....	765
891	Harshaw, Fuller, Goodwin Co., New York, Car No. 12199	American Sumatra Tobacco Co., Bloomfield	2.78	....	3.38	27.22	.....	....	....	891
892	Harshaw, Fuller, Goodwin Co., New York, Car No. 11165	American Sumatra Tobacco Co., Bloomfield	2.83	....	3.44	26.22	.....	....	....	892

VI. MIXED FERTILIZERS.

MIXTURES CONTAINING ONLY NITROGEN AND PHOSPHORIC ACID.

Five samples of this group of materials were analyzed.

1875. Lawn Fertilizer. Apothecaries Hall Co., Waterbury. Sampled by Station agent from stock of Yantic Grain & Products Co., Norwich, Conn.

1952. Tobacco Starter. Apothecaries Hall Co., Waterbury. Sampled by Station agent at factory.

1980. O & W High Grade Tobacco Starter. Olds & Whipple, Inc., Hartford. Sampled by Station agent from stock of Julius Ident, South Windsor, Conn.

1995. Milorganite. Sewerage Commission, Milwaukee, Wis. Sampled by Station agent from stock of T. S. Griswold, West Hartford, Conn.

1665. Swift-Sure Tobacco Starter. M. L. Shoemaker & Co., Philadelphia, Pa. Sampled by Station agent from stock of A. D. Bridge's Sons, Hazardville, Conn.

	1875	1952	1980	1995	1665
	%	%	%	%	%
Nitrogen, found	4.16	3.81	8.11	4.94	3.25
guaranteed	3.29	3.29	8.23	5.00	3.28
Ammonia, equivalent to nitrogen	5.06	4.63	9.86	6.01	3.95
Phosphoric acid, total	11.50	10.88	5.16	2.40	10.93
available found	6.82	9.65	4.14	2.05	10.53
guaranteed	4.00	10.00	3.00	2.00	10.00

MIXTURES CONTAINING ONLY PHOSPHORIC ACID AND POTASH.

Only two samples of this group were analyzed.

2160. Eastern States Open Formula 0-14-6. Eastern States Farmers' Exchange, Springfield, Mass. Sampled by Station agent from stock of H. H. McKnight, Ellington.

It contained 14.83 per cent total and 14.32 per cent available phosphoric acid, and 6.38 per cent of potash.

2224. Dairymen's Special, 0-10-10. I. P. Thomas & Son, Philadelphia. Sampled from stock of H. A. Costello, Mgr., Simsbury.

It contained 10.11 per cent of available phosphoric acid and 10.05 per cent of potash.

MIXTURES CONTAINING ONLY NITROGEN AND POTASH.

2049. Special Tobacco Formula, 9-0-7. Old Deerfield Fertilizer Co., South Deerfield, Mass.

It contained 7.28 per cent of nitrogen (equivalent to 8.85 per

cent of ammonia), 1.85 per cent of available phosphoric acid and 8.08 per cent of potash. It was somewhat deficient in ammonia and contained about 2 per cent of phosphoric acid, although none was guaranteed.

MIXTURES CONTAINING NITROGEN, PHOSPHORIC ACID AND POTASH.

In this group there are 239 official samples and 9 which were sampled by purchasers, a total of 248. Analyses are given in Table XIII. The following tabulated statement summarizes the results of the inspection.

Total number of official samples analyzed		239
Samples considerably deficient in		
one item	61	
two items	5	
three items	0	66
Total items of plant food guaranteed (239 x 3)		717
Total items found deficient:		
ammonia	21	
available phosphoric acid	25	
potash	25	71
Total guaranties substantially met or exceeded		646
Per cent of guaranties substantially met or exceeded		90
Samples showing approximate commercial deficiencies exceeding $1.00 per ton		9

Deficient Samples.

The number of samples found to be substantially below guaranties in one or more items of plant food is less than for several years past. In considering deficiencies those shortages which are within the limits of reasonable analytical variation have been disregarded. Very few of the samples were short in more than one of the guaranteed constituents; and the most expensive element of plant food (nitrogen) showed the fewest deficiencies.

In estimating the approximate value represented by the shortages found, it is our practice to balance such shortages against any overages found. This plan may be open to the objection that a purchaser who, for example, receives less nitrogen than is guaranteed him is not properly compensated by receiving an extra supply of phosphoric acid, or of potash, or of both. However, we are attempting to arrive at a balance of commercial values and not of agricultural values and, moreover, it is not clear that measurable effects of the shortages and overages of such magnitudes as are generally involved in the case of mixed fertilizers can be noted in the field. In the instance of certain raw materials, fish for example, which is purchased chiefly for its nitrogen, the consideration may be somewhat different.

The number of samples showing commercial deficiencies in excess of $1.00 a ton is nine this year, or less than 4 per cent of the total number of official samples examined. In computing these values ammonia has been reckoned at 20 cents a pound, available phosphoric acid at 5½ cents, and potash at 5 cents. Similar data compiled for a nine-year period shows that of more than 2,000 samples examined, 93 per cent of them have substantially equalled or exceeded commercial values as represented by guaranties; and for the past year the corresponding percentage is 96.

The distribution of deficiencies and the summary of commercial deficiencies are given in Tables XIV, XV and XVI.

Grades and Guaranties.

In recent years, there has been an increasing practice of branding mixed fertilizers to show the percentages of plant food which they contain, such percentages being given generally in whole numbers, for example 4-8-4, and representing in the Northeastern States ammonia, available phosphoric acid and potash in the order named. This order does not prevail in all sections of the country, however, the chief variation from it being that available phosphoric is sometimes stated first. Thus using the above example, the statement would be 8-4-4. For some time there has been an effort made to have designations of grade made in a uniform manner and the Association of Official Agricultural Chemists has approved of the statement of grade giving the nitrogenous element first and giving it in terms of nitrogen instead of ammonia. The American Fertilizer Association agrees to this plan as do also agronomists who have, in fact, been largely responsible for the reversion to the plan of stating nitrogenous constituents in terms of the element nitrogen.

There has been very little inclination on the part of manufacturers to adopt the new plan this year. Of all the firms registering mixed fertilizers in this State all but three have adhered to the old plan. It is gratifying to observe that where the new plan has been followed nitrogen has been stated in whole numbers, allowing the fractions to fall on the ammonia equivalent.

In Table XIII, which gives analyses of mixed fertilizers, the column headed "grade" has the usual significance, that is, the first figure denotes ammonia. The few departures from this plan are indicated by foot notes.

Quality of the Organic Nitrogen.

The usual laboratory methods for evaluating the activity of the insoluble organic nitrogen in fertilizer materials indicated organic ammoniates of inferior character in only two instances. In one

of these, however, the water soluble nitrogen practically equalled the total nitrogen guaranteed and the sample was passed, without question. In the other, **1845,** Standard Wholesale Acid and Phosphate Works 5-4-5, the total nitrogen found was much short of the guaranty and the activity of the insoluble organic-nitrogen was found to be 31.6 per cent by the alkaline method and 59.4 per cent by the neutral method. Values of less than 50 and 80 by these respective methods are taken to indicate the presence of ammoniates of inferior quality.

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station: **American Agricultural Chemical Co., New York City.**		
1733	AAC Acme Fertilizer	1-9-4	Meriden
1489	AAC Aroostook Potato Manure	5-8-7	Plantsville
1827	AAC Aroostook Potato Manure	5-8-7	Bristol
1741	AAC Complete General Fertilizer	3-8-4	Norfolk
1842	AAC Double A Tobacco Fertilizer	5-3-5	West Suffield
1493	AAC Gladiator Fertilizer	4-8-7	New Britain
1491	AAC Grass & Lawn Top Dressing	6-6-4	Farmington
1846	AAC Hi Grade Tobacco Manure	7-3-7	Glastonbury
1490	AAC Monarch Fertilizer	4-8-4	Plantsville
1737	AAC Prolific 10% Potash Fertilizer	2-8-10	North Haven
2128	AAC Prolific 10% Potash Fertilizer	2-8-10	Canaan
2126	AAC Prolific 10% Potash Fertilizer	2-8-10	North Haven
1497	AAC Special Grass Top Dressing	8-6-6	Simsbury
1495	Agrico for Corn	3-10-6	New Canaan
1498	Agrico for Potatoes	4-8-6	Simsbury
1492	Agrico for Truck	5-10-5	Farmington
1826	Agrico for Truck	5-10-5	Farmington
1513	Bowker's All Round Fertilizer	3-8-4	New Canaan
1512	Bowker's Market Garden Fertilizer	4-8-4	New Canaan
1736	Bowker's Potato and Vegetable Phosphate	2-9-3	Portland
1516	Bowker's Stockbridge Hill and Drill Fertilizer	4-8-7	Bristol
1840	Bowker's Stockbridge Tobacco Manure	5-3-5	Thompsonville
1515	Bradley's Blood, Bone and Potash	5-8-7	Simsbury
1571	Bradley's Complete Manure for Potatoes and Vegetables	4-8-7	Broad Brook
1570	Bradley's Complete Tobacco Manure	5-3-5	Broad Brook
1947	Bradley's Northland Potato Grower	4-8-4	North Franklin
1948	Bradley's Potato Fertilizer	2-9-3	Colchester
1510	Bradley's Potato Manure	3-8-4	Meriden
1509	Bradley's XL Superphosphate of Lime	3-10-4	Suffield
1572	Bradley's XL Superphosphate of Lime	3-10-4	Broad Brook
1508	National Aroostook Special Fertilizer	5-8-7	Farmington
1742	National Complete Tobacco Fertilizer	5-3-5	Simsbury
1507	National Market Garden Fertilizer	3-8-4	Farmington
1843	National Pine Tree State Potato Fertilizer	4-8-4	Thompsonville
1514	National Premier Potato Manure	4-8-7	Danbury
1841	Sanderson's Atlantic Coast Mixture	3-10-4	Hamden
1844	Sanderson's Complete Tobacco Grower	5-3-5	Warehouse Point
1740	Sanderson's Corn Superphosphate	2-9-3	Canaan
1511	Sanderson's Formula A	4-8-4	Guilford
1566	Sanderson's Formula B	4-8-7	Glastonbury

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.
%	%	%	%	%	%	%	%	%	%	%	
0.04	0.24	0.49	0.23	1.00	1.22	0.25	9.15	8.90	4.02	4.02	1733
0.62	2.52	0.43	0.36	3.93	4.78	0.46	8.65	8.19	6.38	6.38	1439
0.56	2.68	0.45	0.42	4.11	5.00	0.60	8.60	8.00	6.69	6.69	1827
0.00	1.58	0.52	0.38	2.48	3.02	0.18	8.25	8.07	4.19	4.19	1741
0.38	1.34	0.30	2.21	4.23	5.14	0.15	3.44	3.29	0.62	4.60	1842
0.34	2.02	0.56	0.45	3.37	4.10	0.13	8.25	8.12	7.15	7.15	1493
0.54	3.80	0.19	0.46	4.99	6.07	0.16	6.65	6.49	4.22	4.22	1491
0.32	1.18	0.77	3.49	5.76	7.00	0.21	3.90	3.69	0.69	8.26	1846
0.36	2.04	0.55	0.37	3.32	4.04	0.47	8.60	8.13	3.96	3.96	1490
0.00	0.90	0.52	0.32	1.74	2.11	0.30	8.60	8.30	9.26	9.26	1737
0.22	0.88	0.35	0.26	1.71	2.08	0.15	8.35	8.20	9.94	9.94	2128
0.00	1.02	0.42	0.30	1.74	2.11	0.28	8.30	8.02	9.97	9.97	2126
0.94	4.78	0.17	0.70	6.59	8.01	0.20	6.75	6.55	5.97	5.97	1497
0.12	1.52	0.51	0.35	2.50	3.04	0.28	10.25	9.97	6.17	6.17	1495
0.24	2.08	0.53	0.51	3.36	4.09	0.15	7.95	7.80	6.00	6.00	1498
0.46	2.54	0.54	0.52	4.06	4.94	0.58	10.24	9.66	5.12	5.12	1492
0.50	2.52	0.47	0.46	3.95	4.80	0.67	10.52	9.85	5.30	5.30	1826
0.00	1.60	0.47	0.40	2.47	3.00	0.23	8.15	7.92	4.23	4.23	1513
0.32	2.00	0.61	0.43	3.36	4.09	0.50	8.50	8.00	4.02	4.02	1512
0.04	0.92	0.41	0.35	1.72	2.09	0.25	8.95	8.70	3.09	3.09	1736
0.26	1.96	0.56	0.57	3.35	4.07	0.30	8.23	7.93	7.33	7.33	1516
0.46	1.12	0.38	2.09	4.05	4.92	0.15	3.35	3.20	0.43	5.41	1840
0.48	2.72	0.40	0.51	4.11	5.00	0.45	8.50	8.05	7.03	7.03	1515
0.30	2.16	0.36	0.49	3.31	4.02	0.28	8.15	7.87	7.36	7.36	1571
0.40	1.44	0.19	2.29	4.32	5.25	0.23	3.43	3.20	0.29	5.12	1570
0.38	2.00	0.47	0.42	3.27	3.98	0.48	8.50	8.02	4.03	4.03	1947
0.00	0.90	0.51	0.27	1.68	2.04	0.20	8.78	8.58	4.76	4.76	1948
0.04	1.64	0.44	0.40	2.52	3.06	0.21	8.08	7.87	4.06	4.06	1510
0.06	1.58	0.53	0.38	2.55	3.10	0.30	10.38	10.08	4.02	4.02	1509
0.12	1.62	0.45	0.42	2.61	3.17	0.45	10.10	9.65	4.72	4.72	1572
0.48	2.84	0.39	0.44	4.15	5.05	0.53	8.68	8.15	6.90	6.90	1508
0.52	1.28	0.20	2.12	4.12	5.01	0.17	3.53	3.36	0.58	5.08	1742
0.10	1.70	0.36	0.38	2.54	3.09	0.18	8.25	8.07	4.07	4.07	1507
0.36	2.00	0.49	0.42	3.27	3.98	0.41	8.90	8.49	4.03	4.03	1843
0.40	1.96	0.39	0.48	3.23	3.93	0.30	8.53	8.23	7.06	7.06	1514
0.00	1.84	0.49	0.45	2.78	3.38	0.25	9.90	9.65	5.45	5.45	1841
0.18	1.34	0.50	2.12	4.14	5.03	0.15	3.48	3.33	0.57	5.23	1844
0.00	0.94	0.53	0.33	1.80	2.19	0.25	9.38	9.13	3.39	3.39	1740
0.36	2.00	0.58	0.42	3.36	4.09	0.49	8.58	8.09	3.93	3.93	1511
0.44	2.28	0.02	0.55	3.29	4.00	0.28	8.30	8.02	0.70	6.94	1566

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station: **American Agricultural Chemical Co., New York City.**		
1739	Sanderson's Formula B	4-8-7	Gaylordsville
1567	Sanderson's Potato Manure	3-8-4	Derby
1942	Sanderson's Potato Manure	3-8-4	Derby
	Apothecaries Hall Co., Waterbury, Conn.		
1835	Liberty Corn and All Crops 2-8-2	2-8-2	Norwich
1755	Liberty Corn, Fruit and All Crops 2-12-4	2-12-4	Greenwich
1743	Liberty Double Strength 10-16-14	10-16-14	Sampled at factory
1517	Liberty Fish, Bone and Potash 3-8-3	3-8-3	North Haven
1520	Liberty High Grade Market Gardener's 5-8-7	5-8-7	West Cheshire
1953	Liberty High Grade Tobacco Manure 7-3-7	7-3-7	Sampled at factory
1759	Liberty Onion Special 4-8-7	4-8-7	Sampled at factory
1837	Liberty Potato and General Crop 4-8-10	4-8-10	Norwich
1506	Liberty Potato and Market Gardener's Special 4-8-4	4-8-4	West Cheshire
1836	Liberty Potato and Vegetable 2-8-10	2-8-10	Norwich
1756	Liberty Special Fertilizer for Fruit 7-8-6	7-8-6	Torrington
1955	Liberty Tobacco Special C. S. M. Base 5-3-5	5-3-5	Sampled at factory
1838	Liberty Top Dresser for Grass and Grain 10-3½-8	10-3.5-8	Norwich
	Armour Fertilizer Works, New York City.		
1581	Armour's Big Crop Fertilizer 2-12-4	2-12-4	Wethersfield
1575	Armour's Big Crop Fertilizer 3-8-4	3-8-4	Meriden
1881	Armour's Big Crop Fertilizer 4-6-10	4-6-10	Granby
1761	Armour's Big Crop Fertilizer 4-16-4	4-16-4	Wallingford
1577	Armour's Big Crop Fertilizer 4-8-4	4-8-4	Danbury
1580	Armour's Big Crop Fertilizer 5-8-7	5-8-7	Wethersfield
1762	Armour's Big Crop Fertilizer 7-11-10	7-11-10	Wallingford
1578	Armour's Big Crop Fertilizer 8-6-6	8-6-6	Thompsonville
1769	Armour's Big Crop Tobacco Special 5-3-5	5-3-5	Enfield
1882	Armour's Big Crop Tobacco Special 5-3-5	5-3-5	Granby
	Associated Seed Growers, Inc., New Haven, Conn.		
1528	Tip Top Brand	5-8-7	Associated Seed Growers, Inc., Milford
1529	Special Mixture for General Use	4-8-4	Associated Seed Growers, Inc., Milford

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.
%	%	%	%	%	%	%	%	%	%	%	
0.28	1.80	0.63	0.59	3.30	4.01	0.30	8.25	7.95	0.93	7.25	1739
0.14	1.62	0.30	0.37	2.43	2.95	0.25	8.18	7.93	3.88	3.88	1567
0.08	1.58	0.47	0.44	2.57	3.12	0.20	8.33	8.13	4.04	4.04	1942
0.06	1.22	0.29	0.64	2.21	2.69	1.40	8.93	7.53	2.73	2.73	1835
0.08	1.64	0.44	0.14	2.30	2.80	1.63	13.20	11.57	4.21	4.21	1755
1.00	3.24	3.00	0.44	7.68	9.34	0.48	16.49	16.01	13.72	13.72	1743
0.00	1.08	0.31	1.64	3.03	3.68	1.25	8.93	7.68	3.46	3.46	1517
0.80	2.96	0.34	0.16	4.26	5.18	1.05	8.90	7.85	7.07	7.07	1520
0.00	1.88	0.43	3.72	6.03	7.33	0.78	4.74	3.96	0.86	8.31	1953
0.26	1.70	0.61	0.77	3.34	4.06	4.18	12.82	8.64	0.78	10.70	1759
1.50	1.06	0.50	0.44	3.50	4.26	0.83	8.65	7.82	11.02	11.02	1837
0.00	2.04	0.50	0.81	3.35	4.07	1.13	9.35	8.22	4.13	4.13	1506
0.18	0.98	0.44	0.54	2.14	2.60	0.75	8.02	7.27	11.27	11.27	1836
2.96	2.04	0.25	0.59	5.84	7.10	1.43	9.38	7.95	6.17	6.17	1756
0.00	1.66	0.24	2.55	4.45	5.41	0.58	4.79	4.21	0.35	6.69	1955
4.58	3.02	0.00	0.71	8.31	10.10	0.06	3.93	3.87	10.59	10.59	1838
0.36	1.20	0.38	0.04	1.98	2.41	0.75	12.40	11.65	4.02	4.02	1581
0.18	2.06	0.13	0.05	2.42	2.94	0.25	8.15	7.90	4.04	4.04	1575
0.52	2.40	0.30	0.05	3.27	3.98	0.30	6.64	6.34	9.69	9.69	1881
0.68	2.34	0.33	0.08	3.43	4.17	0.31	16.51	16.20	4.32	4.32	1761
0.38	2.44	0.28	0.11	3.21	3.90	0.41	8.26	7.85	4.19	4.19	1577
0.00	3.08	0.96	0.08	4.12	5.01	0.55	8.95	8.40	6.55	6.55	1580
1.32	4.12	0.19	0.04	5.67	6.89	0.14	11.63	11.49	10.22	10.22	1762
1.06	5.00	0.28	0.07	6.41	7.79	0.35	6.79	6.44	6.01	6.01	1578
1.72	0.02	0.47	1.91	4.12	5.01	0.38	3.73	3.35	0.61	4.97	1769
1.46	0.12	0.29	2.32	4.19	5.09	0.36	4.25	3.89	0.64	5.62	1882
1.46	1.46	0.14	1.30	4.36	5.30	0.30	8.35	8.05	7.04	7.04	1528
0.92	1.48	0.17	0.93	3.50	4.26	0.25	8.35	8.10	6.96	6.96	1529

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Associated Seed Growers, Inc., New Haven, Conn.		
1530	Special Mixture 6% Potash	4-8-6	Associated Seed Growers, Inc., Milford
	F. A. Bartlett Tree Expert Co., Stamford, Conn.		
1440	Bartlett Green Tree Food	6-7-4	Sampled at factory
	Berkshire Chemical Co., Bridgeport, Conn.		
1521	Berkshire Complete Fertilizer	2-9-3	Southport
1883	Berkshire Complete Tobacco Fertilizer	5-3-5	Granby
1574	Berkshire Economical Grass Fertilizer	10-3-8	Sampled at factory
1920	Berkshire Economical Grass Fertilizer	10-3-8	Ellington
1374	Berkshire Grass Special Fertilizer	7-6-5	Hamden
1376	Berkshire Long Island Special Fertilizer	5-8-7	Hamden
1377	Berkshire Market Garden Fertilizer	4-8-4	Hamden
1884	Berkshire Tobacco Special Fertilizer	7-3-7	Granby
1885	Berkshire Tobacco Starter Fertilizer	5-8-10	Ellington
1583	Berkshire Truck Fertilizer	5-8-5	North Haven
	Amos D. Bridge's Sons, Inc., Hazardville, Conn.		
1673	Corn, Onion, Potato and General Purpose	4-8-4	Sampled at factory
1950	Special Tobacco Fertilizer	5-3-5	Sampled at factory
	E. D. Chittenden Co., Bridgeport, Conn.		
2043	Chittenden's Complete Tobacco and Onion Grower	4-8-4	Tolland
2042	Chittenden's High Grade Potato 7% Potash	5-8-7	Tolland
2044	Chittenden's Potato Special 4% Potash	4-8-4	Abington
2066	Chittenden's Tobacco Special	5-4-5	Wapping
	C & R Sales Co., Worcester, Mass.		
1958	C & R Lawn and Shrub Fertilizer 5-6-5	5-6-5	Putnam
	Davey Tree Expert Co., Inc., Kent, Ohio.		
1441	Davey Tree Food	10-3-3	Sound Beach

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.	
%	%	%	%	%	%	%	%	%	%	%	
0.92	1.36	0.22	1.00	3.50	4.26	0.30	8.23	7.93	7.40	7.40	1530
0.28	4.26	0.00	0.86	5.40	6.57	2.18	10.20	8.02	5.22	5.22	1440
0.04	0.90	0.39	0.67	2.00	2.43	2.63	11.79	9.16	3.91	3.91	1521
1.02	0.00	0.46	2.54	4.02	4.89	0.08	4.23	4.15	0.84	5.69	1883
7.24	0.00	0.29	0.48	8.01	9.74	1.06	9.03	7.97	1.55	8.81	1574
6.96	0.00	0.79	0.81	8.56	10.41	1.79	9.25	7.46	2.07	9.77	1920
2.08	2.12	0.37	1.08	5.65	6.87	0.20	6.58	6.38	6.09	6.09	1374
0.20	2.52	0.41	0.90	4.03	4.90	0.10	8.08	7.98	8.96	8.96	1376
1.24	1.40	0.32	0.69	3.65	4.44	0.27	8.60	8.33	5.09	5.09	1377
1.84	0.12	0.67	3.16	5.79	7.04	0.13	4.03	3.90	0.72	7.48	1884
2.02	1.34	0.47	0.72	4.55	5.53	0.18	9.23	9.05	0.74	9.38	1885
0.00	2.62	0.40	1.02	4.04	4.91	0.20	7.95	7.75	6.79	6.79	1583
0.84	1.86	0.00	0.60	3.30	4.01	1.10	9.25	8.15	4.51	4.51	1673
0.94	0.00	0.41	3.00	4.35	5.29	0.47	4.50	4.03	0.36	5.85	1950
0.00	2.80	0.08	0.36	3.24	3.94	0.30	8.19	7.89	2.27	4.59	2043
0.00	3.48	0.15	0.39	4.02	4.89	0.31	8.43	8.12	2.47	7.04	2042
0.00	2.96	0.07	0.29	3.32	4.04	0.45	8.51	8.06	4.57	4.57	2044
0.00	2.60	0.30	1.27	4.17	5.07	0.23	5.29	5.06	1.28	5.50	2066
0.00	2.00	0.54	2.27	4.81	5.85	0.28	7.15	6.87	7.01	7.01	1958
0.00	5.38	1.01	2.00	8.39	10.20	3.63	8.45	4.82	3.14	3.14	1441

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Eastern States Farmers' Exchange, Springfield, Mass.[1]		
1763	Eastern States Open Formula 4-8-8	4-8-8	North Haven
1582	Eastern States Open Formula 4-10-6	4-10-6	Ellington
1764	Eastern States Open Formula 4-12-4	4-12-4	North Haven
1765	Eastern States Open Formula 4-20-16	4-20-16	Clinton
1522	Eastern States Open Formula 6-8-6	6-8-6	North Haven
1531	Eastern States Open Formula 6-15-9	6-15-9	Meriden
1757	Eastern States Open Formula 6-18-6	6-18-6	West Simsbury
1970	Eastern States Open Formula 8-4-8	8-4-8	New Milford
1523	Eastern States Open Formula 8-16-16	8-16-16	North Haven
1966	Eastern States Open Formula 8-16-16	8-16-16	Buckland
1973	Eastern States Open Formula 8-16-16	8-16-16	Woodstock
1791	Eastern States Open Formula 10-5-10	10-5-10	West Simsbury
	Essex Fertilizer Co., Boston, Mass.		
1525	Essex Complete Manure 5-8-7	5-8-7	Wallingford
1526	Essex Fish Fertilizer for All Crops 3-8-4	3-8-4	Wallingford
1943	Essex Fish Fertilizer for All Crops 3-8-4	3-8-4	Cromwell
1524	Essex Market Garden 4-8-4	4-8-4	Wallingford
1527	Essex Peerless Potato Manure 4-6-10	4-6-10	Wallingford
1786	Essex Top Dressing	7-6-5	So. Manchester
	Friedman Tobacco Products Corp., York, Pa.[1]		
1378	Tobacco Dust Fertilizer	2-4-2[2]	Hamden
	L. T. Frisbie Co., New Haven, Conn.		
1445	Frisbie's Corn and Grain Fertilizer 2-10-2	2-10-2	Danbury
1784	Frisbie's 5-8-7	5-8-7	Wethersfield
1790	Frisbie's 5-10-5	5-10-5	Winsted
1438	Frisbie's Market Garden 5-8-7	5-8-7	Wethersfield
1787	Frisbie's Special 3-8-4	3-8-4	Waterbury
1439	Frisbie's Special Vegetable and Potato Grower 4-8-4	4-8-4	Guilford
1971	Frisbie's Tobacco Grower 7-3-7	7-3-7	Buckland
1444	Frisbie's Top Dresser 8-6-6	8-6-6	Danbury

[1] First figure in "grade" column represents "nitrogen," not ammonia.
[2] Total P_2O_5.

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.	
%	%	%	%	%	%	%	%	%	%	%	
0.94	2.28	0.79	0.24	4.25	5.17	0.31	9.73	9.42	7.47	7.47	1763
0.82	2.44	0.00	0.72	3.98	4.84	0.58	11.13	10.55	6.04	6.04	1582
1.62	2.00	0.26	0.24	4.12	5.01	0.44	12.85	12.41	4.56	4.56	1764
1.14	2.50	0.43	0.34	4.41	5.36	0.28	21.60	21.32	15.09	15.09	1765
2.14	3.08	0.29	0.85	6.36	7.73	0.23	8.40	8.17	6.41	6.41	1522
1.36	4.02	0.28	0.39	6.05	7.36	0.35	15.58	15.23	9.43	9.43	1531
1.02	4.16	0.57	0.68	6.43	7.82	0.55	19.50	18.95	6.59	6.59	1757
2.44	0.44	3.40	2.52	8.80	10.70	0.09	5.43	5.34	1.70	9.94	1970
1.50	5.88	0.15	0.80	8.33	10.13	0.40	20.15	19.75	13.45	13.45	1523
1.32	5.20	0.88	0.38	7.78	9.46	0.28	16.30	16.02	17.24	17.24	1966
1.58	5.12	0.58	0.42	7.70	9.36	0.45	17.30	16.85	16.04	16.04	1973
3.42	0.56	5.18	2.11	11.27	13.70	0.15	5.54	5.39	1.86	10.52	1791
0.36	2.52	0.57	0.67	4.12	5.01	0.78	8.78	8.00	6.58	6.58	1525
0.00	0.67	1.11	0.64	2.42	2.94	1.18	8.30	7.12	4.06	4.06	1526
0.00	1.48	0.51	0.72	2.71	3.29	0.81	8.48	7.67	4.36	4.36	1943
0.40	1.84	0.45	0.76	3.45	4.19	0.83	8.83	8.00	4.00	4.00	1524
0.40	1.88	0.35	0.76	3.39	4.12	0.38	6.70	6.32	10.08	10.08	1527
0.00	5.64	0.00	0.11	5.75	6.99	0.03	6.25	6.22	4.94	4.94	1786
0.16	0.20	0.36	1.41	2.13	2.59	0.08	0.50	0.42	0.80	2.62	1378
0.08	0.58	0.50	0.59	1.75	2.13	0.55	10.16	9.61	2.12	2.12	1445
0.32	3.08	0.51	0.34	4.25	5.17	0.37	9.00	8.63	0.49	7.05	1784
0.30	3.20	0.42	0.35	4.27	5.19	0.64	10.76	10.12	5.41	5.41	1790
0.24	3.16	0.57	0.33	4.30	5.23	0.48	8.90	8.42	6.83	6.83	1438
0.10	1.52	0.37	0.65	2.64	3.21	0.57	8.74	8.17	4.17	4.17	1787
0.36	1.96	0.32	0.65	3.29	4.00	0.35	8.30	7.95	4.09	4.09	1439
1.56	0.14	0.03	4.00	5.73	6.97	0.13	4.60	4.47	1.08	7.91	1971
1.24	4.84	0.24	0.34	6.66	8.10	0.30	6.70	6.40	5.71	5.71	1444

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Grasselli Chemical Co., Cleveland, Ohio.		
1785	Grasselli Odorless Plant Food	5-13-4	Fair Haven
	International Agricultural Corp., Boston, Mass.		
2048	I. A. C. Caribee Tobacco Fertilizer	7-6-5	West Suffield
1886	Premium Tobacco Fertilizer	7-9-8	Hockanum
	Lowell Fertilizer Co., Boston, Mass.		
1456	Lowell Animal Brand, A High Grade Manure for All Crops, 3-8-4	3-8-4	Southington
1788	Lowell Bone Fertilizer 2-10-2	2-10-2	Southbury
1457	Lowell Corn and Vegetable 4-8-4	4-8-4	Southington
1519	Lowell Corn and Vegetable 4-8-4	4-8-4	Cheshire
1462	Lowell Market Garden 5-8-7	5-8-7	Cheshire
1789	Lowell Potato Grower 4-6-10	4-6-10	Southbury
2116	Lowell Tobacco 5-3-5	5-3-5	Warehouse Point
1461	Lowell Top Dressing 7-6-5	7-6-5	Cheshire
	Maine Farmers' Exchange, Portland, Me.		
1963	M. F. E. "Produce More" 3-10-3	3-10-3	New Milford
1964	M. F. E. "Produce More" 4-8-5	4-8-5	New Milford
1965	M. F. E. "Produce More" 5-8-7	5-8-7	New Milford
	Mapes Formula and Peruvian Guano Co., New York City.		
1807	Mapes Conn. Valley Special	6-4-7	East Granby
1800	Mapes Corn Manure	3-8-3	Windsor Locks
1808	Mapes General Tobacco Manure	5-4-5	East Granby
1805	Mapes General Truck Manure	5-6-5	Hartford
1801	Mapes General Use Manure	3-6-4	Windsor Locks
1804	Mapes Onion Manure	4-6-4	Hartford
1783	Mapes Potato Manure	4-7-5	Windsor Locks
1802	Mapes Special Trucker	5-8-7	Hartford
1806	Mapes Special Trucker "SP"	5-8-7	Hartford
1918	Mapes Tobacco Ash Constituents	1-4-15	West Suffield
1810	Mapes Tobacco Ash and Starter	4-6-15	Hartford
1967	Mapes Tobacco Manure Wrapper Brand	7.5-2-10.5	Windsor
1799	Mapes Tobacco Starter Improved	5-6-1	Windsor Locks
1803	Mapes Top Dresser	10-4-2	Hartford

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	3.76	0.12	0.12	4.00	4 86	1.14	16.80	15.66	4.90	4.90	1785
0.56	2 84	0.44	2 01	5.85	7.11	0.22	6.90	6 68	0 98	5 85	2048
0.00	2.54	0.95	2.38	5.87	7.14	0.20	9 00	8.80	0.70	8.21	1886
0 00	1 36	0 53	0 70	2.59	3 15	1.15	8 88	7.73	4.14	4 14	1456
0 00	0.92	0 39	0.35	1 66	2 02	1 21	11 31	10 10	2.24	2 24	1788
0 28	1 96	0 49	0 69	3 42	4 16	0.95	8 85	7 90	4 16	4 16	1457
0 36	1 68	0 54	0 76	3 34	4 06	0.70	8.50	7 80	3 97	3 97	1519
0.64	2 90	0 05	0 48	4 07	4 95	0.80	8.65	7 85	6 89	6 89	1462
0 42	1 92	0 32	0 74	3 40	4 13	0 34	6 82	6 48	10 35	10 35	1789
0 80	0 00	0 57	2 74	4 11	5 00	0 24	4 38	4 14	0 93	5 81	2116
0 14	5.50	0.00	0.00	5.64	6 86	0.13	5.50	5.37	5.14	5.14	1461
0 08	1.56	0 49	0 87	3.00	3 65	0 57	11.13	10 56	1.25	4 04	1963
0 34	1.80	1 12	1.02	4.28	5 20	0.45	9.41	8 96	1.69	5 40	1964
0.34	1.56	1.80	0.91	4.61	5 60	0.39	8.68	8.29	3.77	7.00	1965
2.44	0 06	1.58	1.42	5 50	6 69	1.00	5 39	4 39	0 68	7 27	1807
0 26	1 02	1 13	0 48	2 89	3 51	1 24	10 75	9 51	2 72	3 06	1800
1 54	0.04	1 02	1.58	4 18	5 08	1 20	5 50	4 30	0 54	6 26	1808
0 38	3 80	0 00	0 51	4 69	5 70	0 93	8 74	7 81	3 71	4 56	1805
0 46	1 02	1 06	0 35	2 89	3 51	1 00	8.73	7 73	3.75	4 40	1801
0.44	2 88	0 00	0 44	3.76	4 57	0 83	8 47	7 64	0 39	4 19	1804
0 26	2 34	0 30	0 42	3 32	4 04	0 74	8 45	7 71	4 93	5 07	1783
0 36	1 72	1 74	0 60	4 42	5 37	1 07	10 85	9 78	7 09	7 09	1802
0 38	3 40	0 10	0 51	4 39	5 34	0 95	10 33	9 38	0 60	7 47	1806
0 00	0 00	0 42	0 88	1 30	1 58	1 89	6 18	4 29	0 94	17 38	1918
2 22	0 16	0 76	0 50	3 64	4 43	0 81	7 58	6 77	0 70	15 29	1810
3 08	0 08	1 60	1 43	6 19	7 53	0 87	5 33	4 46	0 77	11 92	1967
3 00	0 00	1 29	0 54	4 83	5 87	1 36	8 73	7 37	0 16	1 51	1799
2 22	2 98	3 08	0 30	8 58	10 43	0 52	6 40	5 88	2 01	2 39	1803

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station: **A. G. Markham & Co., Springfield, Mass.**		
1914	4-6-10	4-6-10	Mansfield Depot ..
1913	4-8-4	4-8-4	Mansfield Depot ..
1915	5-8-7	5-8-7	Stafford Springs ..
	Millane Tree Expert Co., Cromwell, Conn.		
2223	Millane Shade Tree Food	10-12-4	Sampled at factory
	New England Fertilizer Co., Boston, Mass.		
1809	New England Complete Manure 4-6-10	4-6-10	Unionville
1975	New England Corn Phosphate 2-10-2	2-10-2	Mansfield Depot ..
1919	New England Market Garden Manure 5-8-7	5-8-7	West Suffield
1465	New England Potato and Vegetable Manure 4-8-4	4-8-4	Meriden
1466	New England Super, A High Grade Fertilizer for all Crops 3-8-4	3-8-4	Meriden
1974	New England Tobacco Manure 5-3-5	5-3-5	Unionville
	Old Deerfield Fertilizer Co., South Deerfield, Mass.		
1981	Old Deerfield Tobacco Starter Bone and Potash..	6-8-12	Suffield
	Olds & Whipple, Inc., Hartford, Conn.		
1793	O & W Blue Label Tobacco Fertilizer	6-3-6	Ellington
1541	O & W Complete Market Garden Fertilizer	4-8-4	So. Manchester ...
2047	O & W Complete Tobacco Fertilizer	5-3-5	So. Windsor
1474	O & W Grass Fertilizer	6-6-4	So. Manchester ...
1473	O & W High Grade Potato and Vegetable Fertilizer	5-8-7	So. Manchester ...
1977	O & W High Grade Starter and Potash Compound	5-4-15	So. Windsor
	Parmenter & Polsey, Boston, Mass.		
1822	P & P Maine Potato Fertilizer 4-6-10	4-6-10	Wallingford
1976	Parmenter & Polsey Top Dressing 7-6-5	7-6-5	Wallingford

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.
%	%	%	%	%	%	%	%	%	%	%	
0.56	2.20	0.28	0.32	3.36	4.09	0.22	6.38	6.16	9.57	9.57	1914
0.32	1.92	0.51	0.47	3.22	3.91	0.66	8.28	7.62	4.04	4.04	1913
0.54	2.80	0.36	0.48	4.18	5.08	0.43	8.65	8.22	7.14	7.14	1915
4.24	2.48	0.57	0.29	7.58	9.22	1.45	14.15	12.70	4.42	4.42	2223
0.18	1.88	0.66	0.48	3.20	3.89	0.45	6.81	6.36	9.77	9.77	1809
0.00	1.00	0.46	0.37	1.83	2.22	0.36	10.53	10.17	2.40	2.40	1975
0.36	3.10	0.44	0.37	4.27	5.19	0.52	8.85	8.33	7.22	7.22	1919
0.34	1.86	0.46	0.56	3.22	3.91	0.83	8.75	7.92	3.85	3.85	1465
0.04	1.68	0.25	0.56	2.53	3.08	0.83	8.62	7.79	3.91	3.91	1466
0.94	0.20	0.40	2.64	4.18	5.08	0.28	4.70	4.42	1.12	6.23	1974
1.92	0.42	1.23	1.86	5.43	6.60	0.45	8.80	8.35	1.29	13.05	1981
1.08	0.00	0.53	3.56	5.17	6.29	0.38	4.12	3.74	0.36	6.51	1793
0.78	1.68	0.20	0.73	3.39	4.12	1.13	9.33	8.20	4.15	4.15	1541
0.74	0.00	0.51	2.97	4.22	5.13	0.42	3.99	3.57	0.44	5.95	2047
2.30	1.70	0.29	0.70	4.99	6.07	0.71	7.00	6.29	4.12	4.12	1474
1.06	2.00	0.18	0.91	4.15	5.05	0.99	9.25	8.26	7.55	7.55	1473
0.98	1.02	0.23	2.27	4.50	5.47	0.70	5.63	4.93	1.79	14.99	1977
0.42	2.00	0.50	0.52	3.44	4.18	0.43	6.65	6.22	10.40	10.40	1822
0.00	5.40	0.18	0.11	5.69	6.92	0.13	6.55	6.42	5.10	5.10	1976

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Piedmont Mt. Airy Guano Co., Baltimore, Md.		
1984	Harvest Brand 2-8-3	2-8-3	Plantsville
1985	Harvest Brand 4-8-4	4-8-4	Plantsville
1983	Harvest Brand 5-8-7	5-8-7	Plantsville
	Frank S. Platt Co., New Haven, Conn.		
1819	Platt's Concentrated Lawn Fertilizer	16-5-5	Sampled at factory
1818	Platco Special 5-8-7	5-8-7	Sampled at factory
	Rackliffe Bros. Co., New Britain, Conn.		
1535	Rackliffe Brand Corn Fertilizer 4-8-4	4-8-4	Sampled at factory
1536	Rackliffe Brand Potato and Special Vegetable 5-8-7	5-8-7	Sampled at factory
	The Rogers & Hubbard Co., Portland, Conn.		
1470	4-8-4 Fertilizer	4-8-4	Hartford
1471	5-8-7 Fertilizer	5-8-7	Hartford
1540	5-10-5 Fertilizer	5-10-5	Sampled at factory
1539	Hubbard's "Bone Base" Fertilizer for Seeding Down	3-5-6	Sampled at factory
1542	Hubbard's "Bone Base" Oats and Top Dressing	10-3-8	Norwich
1922	Hubbard's "Bone Base" Oats and Top Dressing	10-3-8	Sampled at factory
1544	Hubbard's "Bone Base" Soluble Corn and General Crop Manure	3-8-6	Fair Haven
1816	Hubbard's "Bone Base" Soluble Potato Manure	6-8-5	Higganum
1979	Hubbard's "Bone Base" Soluble Tobacco Manure	6-8-10	So. Windsor
1815	Lawn Fertilizer	7.5-2-4.5	New Britain
1817	Rogers & Hubbard All Soils, All Crops Fertilizer	4-10-4	Higganum
1814	Rogers & Hubbard's Corn and Grain Fertilizer	1-10-3	Willimantic
1824	R & H Climax Tobacco Brand	5-3-5	Granby
1478	R & H High Potash Fertilizer	3-8-10	New Britain
1825	R & H High Potash Fertilizer	3-8-10	Branford
1813	Rogers & Hubbard's Potato Fertilizer	2-10-4	Willimantic
1823	R & H Tobacco Grower Vegetable Formula	6-3-5	Granby
1982	R & H Tunaker for Tobacco	10-4-10	East Granby
2230	R & H Tunaker for Tobacco	10-4-10	Sampled at factory

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	0.86	0.65	0.36	1.87	2.27	1.43	8.73	7.30	4.11	4.11	1984
0.00	2.26	0.58	0.25	3.09	3.76	0.66	8.69	8.03	4.35	4.35	1985
0.00	3.56	0.59	0.23	4.38	5.33	0.20	8.33	8.10	7.24	7.24	1983
0.00	13.48	0.28	0.60	14.36	17.46	0.09	5.83	5.74	0.48	6.58	1819
0.22	3.08	0.52	0.46	4.28	5.20	0.56	8.90	8.34	7.10	7.10	1818
0.38	1.94	0.38	0.58	3.28	3.99	0.39	8.55	8.16	4.21	4.21	1535
0.34	3.04	0.44	0.40	4.22	5.13	0.53	8.55	8.02	7.09	7.09	1536
0.10	2.66	0.61	0.15	3.52	4.28	0.20	8.70	8.50	4.03	4.03	1470
0.18	3.52	0.30	0.12	4.12	5.01	0.18	8.87	8.59	6.84	6.84	1471
0.12	3.42	0.62	0.24	4.40	5.35	0.20	10.61	10.41	5.31	5.31	1540
0.94	0.22	0.00	1.26	2.42	2.94	5.88	12.50	6.62	6.80	6.80	1539
7.68	0.16	0.02	0.29	8.15	9.91	2.13	8.71	6.58	3.96	8.62	1542
7.70	0.00	0.39	0.18	8.27	10.05	2.05	8.58	6.53	2.87	8.30	1922
0.40	0.50	1.12	0.44	2.46	2.99	1.43	9.73	8.30	5.77	6.07	1544
1.18	2.12	0.98	0.68	4.96	6.03	1.23	10.20	8.97	0.85	5.07	1816
0.96	2.24	1.25	0.53	4.98	6.05	1.33	10.01	8.68	0.78	10.44	1979
3.96	0.00	0.45	2.30	6.71	8.16	0.54	4.58	4.04	2.71	5.70	1815
0.12	2.08	0.66	0.42	3.28	3.99	0.75	11.03	10.28	4.62	4.62	1817
0.06	0.16	0.51	0.13	0.86	1.05	0.59	11.05	10.46	3.41	3.41	1814
1.76	0.06	0.51	2.11	4.44	5.40	0.43	4.00	3.57	0.54	5.59	1824
0.16	1.44	0.74	0.40	2.74	3.33	0.88	8.50	7.62	10.31	10.31	1478
0.28	1.10	1.02	0.32	2.72	3.31	0.63	8.65	8.02	9.86	9.86	1825
0.10	0.74	0.61	0.29	1.74	2.11	0.53	10.75	10.22	4.99	4.99	1813
1.24	0.18	0.78	2.82	5.02	6.10	0.48	3.69	3.21	0.54	5.43	1823
0.76	0.58	3.31	3.00	7.65	9.30	0.15	4.45	4.30	0.98	10.54	1982
1.34	0.16	3.13	2.89	7.52	9.14	0.15	4.10	3.95	0.70	10.93	2230

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	F. S. Royster Guano Co., Baltimore, Md.		
1993	Royster's Conn. Tobacco Guano	5-3-5	Glastonbury
1646	Royster's Curlew Guano	3-10-6	Waterbury
1645	Royster's Quality Trucker	4-8-7	Waterbury
1994	Royster's Truckers Delight	4-8-4	Glastonbury
	M. L. Shoemaker & Co., Philadelphia, Pa.		
1671	Special Mixture of Bantle's Wrapper Brand	7-3-7	Glastonbury
1668	Swift-Sure Potato Special 5-8-7	5-8-7	New Milford
1672	Swift-Sure Special Tobacco Formula 4-8-5	4-8-5	Glastonbury
1669	Swift-Sure Tobacco and General Use 3-10-3	3-10-3	New Milford
	Springfield Rendering Co., Springfield, Mass.		
1820	Springfield 3-8-4 Fertilizer	3-8-4	Stafford Springs
1821	Springfield 4-8-4 Fertilizer	4-8-4	Stafford Springs
1839	Springfield 5-8-7 Fertilizer	5-8-7	Stafford Springs
2067	Springfield 5-3-5 Tobacco Special	5-3-5	West Springfield
1674	Springfield 7-6-5 Top Dresser	7-6-5	Hazardville
	Standard Wholesale Phosphate & Acid Works, Baltimore, Md.		
1845	5-4-5	5-4-5	Ellington
1604	5-10-5	5-10-5	Milford
1602	8-6-6	8-6-6	Seymour
1606	Evergreen Fish Guano	4-8-4	Norwalk
1603	Golden Rule Guano	4.11-6-10	Seymour
1605	Grain Grower	2-8-2	Norwalk
1999	High Analysis	4-16-4	Seymour
2003	Ideal Potato Grower	4-8-6	Silver Lane
1609	Mammoth Potato Grower	2-8-10	North Haven
1400	Standard U. S. Fish, Bone and Potash	5-8-7	Milford
	Swift & Co., Baltimore, Md.		
1599	Vigoro	4-12-4	Hartford

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.	
%	%	%	%	%	%	%	%	%	%	%	
0.32	0.88	0.21	2.45	3.86	4.69	0.21	3.50	3.29	0.27	5.33	1993
0.12	1.66	0.33	0.48	2.59	3.15	1.18	11.33	10.15	5.41	5.41	1646
0.10	2.04	0.55	0.64	3.33	4.05	1.19	8.90	7.71	7.28	7.28	1645
0.00	2.00	0.63	0.67	3.30	4.01	0.73	8.85	8.12	4.22	4.22	1994
1.56	0.34	0.71	3.02	5.63	6.84	0.85	5.15	4.30	1.34	8.49	1671
0.00	2.84	0.37	1.13	4.34	5.28	2.18	9.40	7.22	6.84	6.84	1668
0.00	1.64	0.25	1.51	3.40	4.13	1.38	9.45	8.07	0.52	5.25	1672
0.00	0.87	1.08	0.74	2.69	3.27	1.50	11.50	10.00	0.44	3.13	1669
0.00	1.76	0.52	0.32	2.60	3.16	0.30	8.70	8.40	4.28	4.28	1820
0.26	1.98	0.56	0.50	3.30	4.01	0.60	8.58	7.98	4.06	4.06	1821
0.44	2.64	0.49	0.53	4.10	4.98	0.55	8.80	8.25	7.21	7.21	1839
1.28	0.08	0.69	2.17	4.22	5.13	0.43	5.05	4.62	0.90	5.72	2067
0.10	5.32	0.19	0.09	5.70	6.93	0.30	6.56	6.26	5.03	5.03	1674
0.00	1.78	0.19	0.65	2.62	3.19	0.38	5.75	5.37	2.54	4.15	1845
0.00	3.64	0.06	0.49	4.19	5.09	0.05	10.22	10.17	4.94	4.94	1604
0.54	5.28	0.24	0.33	6.39	7.77	0.70	8.17	7.47	6.09	6.09	1602
0.00	2.58	0.29	0.57	3.44	4.18	1.29	9.38	8.09	4.29	4.29	1606
0.00	2.86	0.14	0.42	3.42	4.16	0.35	6.65	6.30	9.28	9.28	1603
0.26	0.58	0.37	0.62	1.83	2.22	1.75	9.16	7.41	2.32	2.32	1605
0.00	2.06	1.44	0.22	3.72	4.52	0.26	15.50	15.24	3.93	3.93	1999
0.00	2.68	0.14	0.44	3.26	3.96	0.54	8.74	8.20	6.16	6.16	2003
0.00	2.10	0.18	0.40	2.68	3.26	0.80	8.83	8.03	8.67	8.67	1609
0.00	3.84	0.07	0.18	4.09	4.97	0.30	8.15	7.85	6.86	6.86	1400
0.34	2.58	0.08	0.39	3.39	4.12	0.75	12.95	12.20	4.37	4.37	1599

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Synthetic Nitrogen Products Co., New York City.[1]		
1617	Nitrophoska	15-30-15	North Haven
	Tenn. Copper & Chemical Corp., Lockland, Ohio.		
1664	Loma	6-10-4	Hamden
	I. P. Thomas & Son, Philadelphia, Pa.		
1998	Economy Fertilizer 3-12-3	3-12-3	Clintonville
1620	Long Island Special 4-8-7	4-8-7	Hamden
1754	I. P. Thomas 5-8-7	5-8-7	Milford
1638	Thomas Tobacco Grower	5-4-5	Unionville
1622	Tip Top 3-10-6	3-10-6	Unionville
1621	Truckers High Grade Guano 4-8-4	4-8-4	Milford
1611	7% Guano	7-6-5	Milford
1612	7% Guano	7-6-5	Highwood
1997	Victor Potash Fertilizer 2-8-5	2-8-5	Willimantic
	Triton Oil and Fertilizer Co., New York City.		
1667	Triton 4-8-4 Fertilizer	4-8-4	Milford
1666	Triton 5-8-7 Fertilizer	5-8-7	Milford
	Virginia-Carolina Chemical Co., New York City.		
1632	V-C Aroostook Potato Grower	5-8-7	New Britain
1628	V-C Fish and Potash Compound	2-9-3	New Britain
1637	V-C XXXX Fish and Potash	4-8-4	Guilford
	Wilcox Fertilizer Co., Mystic, Conn.		
1639	Wilcox Corn Special 3-10-4	3-10-4	Sampled at factory
1636	Wilcox High Grade Fish and Potash 4-8-4	4-8-4	Groton
2127	Wilcox High Grade Fish and Potash 4-8-4	4-8-4	Sampled at factory
1651	Wilcox Potato and Vegetable Phosphate 5-8-7	5-8-7	Norwich
1643	Wilcox Top Dresser 7-6-5	7-6-5	New London

[1] The first figure in the "grade" column represents "nitrogen," not ammonia.

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.	
%	%	%	%	%	%	%	%	%	%	%	
....	....	....	....	15.14	18.41	0.01	30.65	30.64	14.27	14.27	1617
0.18	3.78	0.50	0.41	4.87	5.92	0.79	10.99	10.20	4.03	4.03	1664
0.28	1.40	0.31	0.48	2.47	3.00	1.08	13.15	12.07	3.44	4.26	1998
1.68	0.12	1.42	0.35	3.57	4.34	1.10	9.13	8.03	7.53	7.53	1620
0.00	3.60	0.20	0.48	4.28	5.20	0.55	9.44	8.89	7.34	7.34	1754
0.00	0.80	0.73	2.73	4.26	5.18	2.03	9.78	7.75	1.20	6.17	1638
0.00	1.78	0.19	0.60	2.57	3.12	1.15	11.45	10.30	5.82	6.16	1622
0.00	2.86	0.21	0.43	3.50	4.26	1.13	9.25	8.12	3.55	4.37	1621
0.60	4.48	0.00	0.86	5.94	7.22	0.55	7.56	7.01	4.19	4.65	1611
0.48	4.34	0.20	0.95	5.97	7.26	0.60	7.47	6.87	4.28	4.61	1612
0.00	1.24	0.34	0.42	2.00	2.43	0.80	9.49	8.69	4.07	5.09	1997
1.46	0.80	0.50	0.74	3.50	4.26	0.75	9.43	8.68	3.97	3.97	1667
1.34	1.88	0.55	0.73	4.50	5.47	0.68	9.29	8.61	6.67	6.67	1666
0.00	3.10	0.72	0.57	4.39	5.34	0.50	8.85	8.35	7.41	7.41	1632
0.00	0.94	0.60	0.32	1.86	2.26	1.00	10.13	9.13	3.07	3.07	1628
0.00	2.34	0.62	0.28	3.24	3.94	0.95	8.61	7.66	4.12	4.12	1637
1.40	0.24	0.40	0.49	2.53	3.08	0.68	10.83	10.15	4.34	4.76	1639
1.08	0.22	0.97	0.64	2.91	3.54	0.63	8.82	8.19	3.32	4.07	1636
1.28	0.22	0.74	1.00	3.24	3.94	0.73	9.10	8.37	3.91	4.55	2127
1.26	1.46	0.69	0.59	4.00	4.86	0.49	8.86	8.37	7.09	7.09	1651
0.48	1.84	2.47	0.78	5.57	6.77	1.31	8.00	6.69	3.74	5.02	1643

TABLE XIII. ANALYSES OF MIXED FERTILIZERS

Station No.	Manufacturer and Brand.	Grade.	Place of Sampling.
	Sampled by Station:		
	Worcester Rendering Co., Auburn, Mass.		
1647	Prosperity Brand Complete Dressing	6-6-4	Groton
1648	Prosperity Brand Corn and Grain Fertilizer	2-10-2	Groton
1650	Prosperity Brand Market Garden Fertilizer	5-8-7	Groton
1649	Prosperity Brand Potato and Vegetable Fertilizer	4-8-4	Groton
2002	Special Potato Fertilizer	4-6-10	Putnam
1912	Superior Top Dressing	8-6-6	Norwich
	Sampled by Purchaser.		
	Apothecaries Hall Co., Waterbury, Conn.		
1711	Liberty Special Fertilizer for Fruit 7-8-6	7-8-6	Collinsville
	Armour Fertilizer Works, New York City.		
2018	Armour's 5-8-7 Fertilizer	5-8-7	J. L. Futtner, Silver Lane
2019	Armour's 5-3-5 Fertilizer	5-3-5	J. L. Futtner, Silver Lane
	Olds & Whipple, Inc., Hartford, Conn.		
1708	High Grade Potato and Vegetable Fertilizer	5-8-7	Hartford
1709	High Grade Potato and Vegetable Fertilizer	5-8-7	Hartford
	The Rogers & Hubbard Co., Portland, Conn.		
1483	5-8-7 Fertilizer	5-8-7	Beacon Falls
	Standard Wholesale Phosphate & Acid Works, Baltimore, Md.		
1768	4-8-4	4-8-4	Branford
1767	5-8-7	5-8-7	Branford
1766	5-10-5	5-10-5	Branford

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

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.	
%	%	%	%	%	%	%	%	%	%	%	
0.48	3.16	0.81	0.56	5.01	**6.09**	0.83	7.40	**6.57**	4.94	**4.94**	**1647**
0.18	1.00	0.51	0.58	2.27	**2.76**	1.25	10.78	**9.53**	3.48	**3.48**	**1648**
0.48	2.66	0.55	0.64	4.33	**5.26**	1.01	9.45	**8.44**	7.00	**7.00**	**1650**
0.44	1.88	0.33	0.58	3.23	**3.93**	0.80	9.23	**8.43**	4.06	**4.06**	**1649**
0.66	5.04	0.36	0.50	6.56	**7.98**	0.60	6.86	**6.26**	6.39	**6.39**	**1912**
0.38	1.98	0.36	0.60	3.32	**4.04**	0.89	7.15	**6.26**	10.64	**10.64**	**2002**
....	....	....	....	5.45	**6.63**	1.44	9.95	**8.51**	6.10	**6.10**	**1711**
....	....	....	....	4.08	**4.96**	0.39	8.80	**8.41**	7.06	**7.06**	**2018**
....	....	....	....	3.50	**4.26**	0.18	3.38	**3.20**	0.57	**4.98**	**2019**
....	....	....	....	4.26	**5.18**	0.93	9.10	**8.17**	0.49	**7.64**	**1708**
....	....	....	....	4.34	**5.28**	0.95	9.13	**8.18**	0.49	**7.58**	**1709**
....	....	....	....	4.34	**5.28**	0.15	8.90	**8.75**	....	**7.19**	**1483**
....	....	....	....	3.28	**3.99**	0.75	9.48	**8.73**	4.29	**4.29**	**1768**
....	....	....	....	3.96	**4.81**	0.41	8.50	**8.09**	6.87	**6.87**	**1767**
....	....	....	....	4.26	**5.18**	0.35	10.88	**10.53**	4.95	**4.95**	**1766**

TABLE XIV. SUMMARY OF DEFICIENCIES.

Manufacturer.	Number Samples.	Number Guaranties.	Number deficiencies in— Ammonia.	Avail. P_2O_5	Potash	Per cent of guaranties met.
American Agricultural Chemical Co.	43	129	2	5	4	91
Apothecaries Hall Co.	13	39	1	4	1	85
Armour Fertilizer Works	10	30	1	1	2	87
Associated Seed Growers, Inc.	3	9	0	0	0	100
Bartlett, F. A., Tree Expert Co.	1	3	0	0	0	100
Berkshire Chemical Co.	10	30	2	0	1	90
Bridge's Sons, Amos D., Inc.	2	6	0	0	0	100
Chittenden, E. D., Co.	4	12	0	0	0	100
C & R Sales Co.	1	3	0	0	0	100
Davey Tree Expert Co., Inc	1	3	0	0	0	100
Eastern States Farmers' Exchange	12	36	2	0	3	86
Essex Fertilizer Co.	6	18	0	2	1	89
Friedman Tobacco Products Corp.	1	3	0	1[1]	1	33
Frisbie, L. T., Co.	8	24	0	1	1	92
Grasselli Chemical Co.	1	3	1	0	0	67
International Agricultural Corp.	2	6	0	0	0	100
Lowell Fertilizer Co.	8	24	1	2	0	88
Maine Farmers' Exchange	3	9	0	0	0	100
Mapes Formula and Peruvian Guano Co.	14	42	0	0	1	98
Markham, A. G., & Co.	3	9	0	1	1	78
Millane Tree Expert Co.	1	3	1	0	0	67
New England Fertilizer Co.	6	18	0	0	1	94
Old Deerfield Fertilizer Co.	1	3	0	0	0	100
Olds & Whipple, Inc.	6	18	0	0	0	100
Parmenter and Polsey	2	6	0	0	0	100
Piedmont Mt. Airy Guano Co.	3	9	1	1	0	78
Platt, Frank S., Co.	2	6	0	0	0	100
Rackliffe Bros. Co.	2	6	0	0	0	100
Rogers & Hubbard Co., The	19	57	2	1	0	95

[1] Total P_2O_5.

TABLE XIV. SUMMARY OF DEFICIENCIES—*Concluded.*

Manufacturer.	Number Samples.	Number Guaranties.	Number deficiencies in— Ammonia.	Avail. P_2O_5	Potash	Per cent of guaranties met.
Royster, F. S., Guano Co.	4	12	1	1	1	75
Shoemaker, M. L., & Co.	4	12	1	1	0	83
Springfield Rendering Co.	5	15	0	0	0	100
Standard Wholesale Phosphate and Acid Works	10	30	2	2	3	77
Swift & Co.	1	3	0	0	0	100
Synthetic Nitrogen Products	1	3	0	0	1	67
Tennessee Copper and Chemical Corp.	1	3	0	0	0	100
Thomas, I. P., & Sons	9	27	0	0	2	93
Triton Oil and Fertilizer Co.	2	6	0	0	1	83
Virginia-Carolina Chemical Co.	3	9	0	1	0	89
Wilcox Fertilizer Co.	5	15	3	0	0	80
Worcester Rendering Co.	6	18	0	1	0	94
Totals	239	717	21	25	25	90

TABLE XV. SAMPLES SHOWING COMMERCIAL DEFICIENCIES.

Sta. No.	Brand.	Approximate deficiency in money value per ton.
1439	A. A. C. Aroostook Potato Manure	$1.29[1]
1743	Apothecaries Hall Co. Liberty Double Strength	2.91
1526	Essex Fish Fertilizer for All Crops	1.15[1]
1378	Friedman Tobacco Dust Fertilizer	1.64
1451	Lowell Top Dressing 7-6-5	1.11
2223	Millane Shade Tree Food	1.93
1982	R & H Tunaker for Tobacco	1.93
2230	R & H Tunaker for Tobacco	2.57
1845	Standard Wholesale Acid and Phosphate Works, 5-4-5	6.58

[1] Second sample not deficient.

TABLE XVI. COMMERCIAL DEFICIENCIES FOR THE PERIOD 1921-1929.

Manufacturer.	Total number of samples.	Number equaling or exceeding guaranties in money value.	Per cent for 9 yr. period.	No. of samples for 1929.	Per cent for 1929.
American Agricultural Chemical Co.	390	375	96	43	98
Apothecaries Hall Co.	87	86	99	13	92
Armour Fertilizer Works	96	77	80	10	100
Atlantic Packing Co.	51	47	92[1]	0	100
Berkshire Chemical Co.	79	79	100	10	100
Bridge's, A. D., & Sons Co.	19	19	100	2	100
Chittenden, E. D., Co.	56	51	91	4	100
Clark, E. B., Seed Co.	37	34	92[1]	0	...
Eastern States Farmers' Exchange	93	78	84	12	100
Essex Fertilizer Co.	59	56	95	6	83
Frisbie, L. T., Co.	89	79	89	8	100
International Agricultural Corp.	63	57	90	2	100
Lowell Fertilizer Co.	92	82	89	8	88
Mapes Formula and Peruvian Guano Co.	118	117	99	14	100
New England Fertilizer Co.	68	65	96	6	100
Olds and Whipple, Inc.	57	57	100	6	100
Parmenter and Polsey	30	29	97	2	100
Piedmont-Mt. Airy Guano Co.	34	25	74	3	100
Rogers & Hubbard Co., The	132	127	96	19	89
Royster, F. S., Guano Co.	67	54	81	4	100
Shoemaker, M. L., & Co.	26	26	100	4	100
Springfield Rendering Co.	37	35	95	5	100
Standard Wholesale Acid and Phosphate Works	18	17	94[2]	10	90
Thomas, I. P., & Sons	41	41	100	9	100
United States Guano Co.	24	23	96	0	...
Virginia-Carolina Chemical Co.	60	56	93	3	100
Wilcox Fertilizer Co.	65	61	94	5	100
Worcester Rendering Co.	38	34	89	6	100
Totals	2058	1916	93	212	96

[1] No samples in 1929.
[2] For two years.

SPECIAL MIXTURES AND HOME MIXTURES.

Sixty-seven samples of mixed fertilizers have been examined for individuals, such samples in most cases being drawn by the persons interested. The Station is responsible only for the analyses of these materials as received.

Analyses are given in Table XVII.

VIII. MISCELLANEOUS FERTILIZERS, AMENDMENTS, WASTE PRODUCTS, ETC.

SHEEP MANURE, ETC.

Fifteen samples of Sheep manure and other farm manures were analyzed. All met or exceeded their guaranties for nitrogen, phosphoric acid and potash, except two which were slightly deficient in nitrogen. These shortages did not exceed 0.1 per cent.

Analyses are given in Table XVIII.

LIME.

Seven samples of agricultural lime have been examined for purchasers and analyses are given in Table XIX.

OTHER MISCELLANEOUS MATERIALS.

Analyses of various materials with remarks where necessary are given in Table XX.

COLLABORATIVE WORK.

The laboratory has continued to participate in the check meal program of the American Oil Chemists Society and in the check fertilizer program sponsored by the F. S. Royster Guano Company. This work aims to compare and improve methods of analysis and has involved the examination of 45 samples.

TABLE XVII. ANALYSES OF SPECIAL AND HOME MIXTURES.

Station No.	Manufacturer or Brand.	Place of Sampling.	Total Nitrogen.	Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
					Citrate-insoluble.	Total.	So-called "Available."	As Muriate.	Total.	
	Sampled by Station:		%	%	%	%	%	%	%	
1518	Home Mixture for Tobacco ..	L. B. Haas & Co., Hazardville ...	5.60	6.81	0.50	3.65	3.15	0.74	12.74	1518
1904	Home Mixture for Corn	Lester W. Lloyd, Suffield	3.84	4.67	....	9.67	....	4.88	4.88	1904
2161	Special Formula B	F. C. Gould, Silver Lane	4.77	5.80	4.10	12.60	8.50	0.78	6.28	2161
1640	Woodruff Home Mixed Fertilizer	S. D. Woodruff & Sons, Orange..	3.07	3.73	0.30	8.40	8.10	7.12	7.12	1640
	Sampled by Purchaser:									
1235	Formula A	American Sumatra Tobacco Co., Bloomfield	6.02	7.32	0.92	5.18	4.26	....	5.00	1235
1231	"Drill" Fertilizer	American Sumatra Tobacco Co., Bloomfield	9.79	11.90	0.62	3.64	3.02	....	1.28	1231
1236	F. E. Fertilizer	American Sumatra Tobacco Co., Bloomfield	6.02	7.32	0.41	3.53	3.12	....	5.87	1236
1237	F. E. Fertilizer	American Sumatra Tobacco Co., Bloomfield	5.86	7.12	0.49	3.71	3.22	....	6.38	1237
1232	F. A. G. Fertilizer	American Sumatra Tobacco Co., Bloomfield	5.46	6.64	0.90	5.56	4.66	....	4.11	1232
1234	F. B. G. Fertilizer	American Sumatra Tobacco Co., Bloomfield	5.16	6.27	0.88	5.64	4.76	....	5.14	1234
1233	F. C. G. Fertilizer	American Sumatra Tobacco Co., Bloomfield	5.23	6.36	1.25	6.11	4.86	....	7.65	1233

TABLE XVII. ANALYSES OF SPECIAL AND HOME MIXTURES—*Continued.*

Station No.	Manufacturer or Brand.	Place of Sampling.	Total Nitrogen.	Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
					Citrate-insoluble.	Total.	So-called "Available."	As Muriate.	Total.	
	Sampled by Purchaser:		%	%	%	%	%	%	%	
889	Formula A	American Sumatra Tobacco Co., Bloomfield	6.08	7.39	1.17	5.36	4.19	....	6.13	889
890	Formula B	American Sumatra Tobacco Co., Bloomfield	6.08	7.39	1.63	3.06	1.43	....	7.57	890
9780	Special High Grade Tobacco Starter	P. J. Anderson, Windsor	7.90	....	0.53	4.80	4.27	....	0.80	9780
9781	Special High Grade Tobacco Starter	P. J. Anderson, Windsor	8.12	....	0.63	....	....	....	0.79	9781
9779	Special Home Mixture	P. J. Anderson, Windsor	4.88	5.93	0.33	4.05	3.72	....	7.12	9779
1678	Potato Fertilizer	Hatheway & Steane, Inc., Hartford	5.59	6.80	0.53	10.38	9.85	0.69	9.56	1678
1307	Special Tobacco Fertilizer, Hasting Farm	Consolidated Cigar Corp., Hartford	6.07	7.38	0.53	4.13	3.60	0.08	4.18	1307
1306	Special Tobacco Fertilizer, Hinsdale Farm	Consolidated Cigar Corp., Hartford	6.10	7.42	0.60	4.36	3.76	0.11	4.43	1306
1305	Special Tobacco Fertilizer, Hunting Farm	Consolidated Cigar Corp., Hartford	6.09	7.40	0.50	3.80	3.30	0.11	4.66	1305
1303	Special Tobacco Fertilizer, Kanter Farm	Consolidated Cigar Corp., Hartford	6.15	7.48	0.48	4.07	3.59	0.08	4.14	1303
1304	Special Tobacco Fertilizer, Myers Farm	Consolidated Cigar Corp., Hartford	6.06	7.37	0.50	4.29	3.79	0.09	4.42	1304
1302	Special Tobacco Fertilizer Shaker Farm	Consolidated Cigar Corp., Hartford	6.08	7.39	0.50	4.48	3.98	0.07	4.34	1302

TABLE XVII. ANALYSES OF SPECIAL AND HOME MIXTURES—*Continued.*

Station No.	Manufacturer or Brand.	Place of Sampling.	Total Nitrogen.	Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
					Citrate-insoluble.	Total.	So-called "Available."	As Muriate.	Total.	
	Sampled by Purchaser:		%	%	%	%	%	%	%	
1426	Special Tobacco Fertilizer, Spear Farm	Consolidated Cigar Corp., Hartford	5.93	7.21	....	4.00	....	....	4.20	1426
1427	Special Tobacco Fertilizer, Warner Farm	Consolidated Cigar Corp., Hartford	6.12	7.44	....	4.11	.....	....	4.17	1427
1301	Special Tobacco Fertilizer, Whitaker Farm	Consolidated Cigar Corp., Hartford	5.96	7.25	0.49	4.20	3.71	0.13	4.78	1301
1309	Special Tobacco Fertilizer, Winton Farm	Consolidated Cigar Corp., Hartford	6.09	7.40	0.37	4.06	3.69	0.11	4.21	1309
1308	Special Tobacco Fertilizer, Wolf Farm	Consolidated Cigar Corp., Hartford	6.19	7.53	0.55	4.43	3.88	0.11	4.28	1308
2129	Special Mixture Fertilizer, Higgins	Consolidated Cigar Corp., Hartford	5.24	6.37	0.35	3.85	3.50	0.54	5.76	2129
2130	Special Mixture Fertilizer, Stevenson	Consolidated Cigar Corp., Hartford	5.06	6.15	0.38	3.23	2.85	0.42	5.38	2130
2131	Special Mixture Fertilizer, Lata	Consolidated Cigar Corp., Hartford	5.69	6.92	0.73	4.93	4.20	0.40	6.57	2131
2132	Special Mixture Fertilizer, Bihl	Consolidated Cigar Corp., Hartford	5.28	7.08	0.68	4.45	3.77	0.36	7.08	2132
2133	Special Mixture Fertilizer, Jones	Consolidated Cigar Corp., Hartford	6.10	7.42	1.92	6.90	4.98	0.74	8.37	2133
2134	Special Mixture Fertilizer, Dickau	Consolidated Cigar Corp., Hartford	5.89	7.16	0.31	3.88	3.57	0.47	8.31	2134

TABLE XVII. ANALYSES OF SPECIAL AND HOME MIXTURES—*Continued.*

Station No.	Manufacturer or Brand.	Place of Sampling.	Total Nitrogen.	Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
					Citrate-insoluble.	Total.	So-called "Available."	As Muriate.	Total.	
	Sampled by Purchaser:		%	%	%	%	%	%	%	
2135	Special Mixture Fertilizer, House	Consolidated Cigar Corp., Hartford	6.28	7.64	1.38	6.10	4.72	0.66	7.81	2135
2136	Special Mixture Fertilizer, Keeney	Consolidated Cigar Corp., Hartford	5.66	6.88	0.42	3.93	3.51	0.48	8.33	2136
9818	Eastern States 12-24-12	Eastern States Farmers' Exchange, Springfield, Mass.	11.02	13.40	1.62	23.70	22.08	0.19	12.07	9818
9819	Eastern States 10-20-15	Eastern States Farmers' Exchange, Springfield, Mass.	9.96	12.11	1.68	20.90	19.22	0.19	13.69	9819
9820	Eastern States 10-30-10	Eastern States Farmers' Exchange, Springfield, Mass.	9.40	11.43	1.85	30.20	28.35	0.04	10.76	9820
1555	Fertilizer	L. B. Haas & Co., Inc., Hazardville	5.50	6.69	....	3.65	....	0.57	11.65	1555
1831	Olds & Whipple Fertilizer, Form. No. 1	I. Kaffenburgh & Sons, Inc., Hartford	7.11	8.64	0.18	3.65	3.47	0.62	11.86	1831
1832	Olds & Whipple Fertilizer Form. No. 2	I. Kaffenburgh & Sons, Inc., Hartford	7.73	9.40	0.33	3.73	3.40	0.70	14.31	1832
1833	Olds & Whipple Fertilizer, Form. No. 3	I. Kaffenburgh & Sons, Inc., Hartford	6.30	7.66	0.38	3.28	2.90	0.62	10.47	1833
1834	Olds & Whipple Fertilizer, Form. No. 4	I. Kaffenburgh & Sons, Inc., Hartford	6.60	8.02	0.33	3.40	3.07	0.56	11.89	1834

TABLE XVII. ANALYSES OF SPECIAL AND HOME MIXTURES—*Continued.*

Station No.	Manufacturer or Brand.	Place of Sampling.	Total Nitrogen.	Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
					Citrate-insoluble.	Total.	So-called "Available."	As Muriate.	Total.	
	Sampled by Purchaser:		%	%	%	%	%	%	%	
1909	Rogers & Hubbard R 4 Mixture	I. Kaffenburgh & Sons, Inc., Hartford	6.22	7.56	0.33	7.99	7.66	1.02	20.49	1909
1910	Rogers & Hubbard R 5 Mixture	I. Kaffenburgh & Sons, Inc., Hartford	6.84	8.32	0.20	7.71	7.51	1.06	22.40	1910
2071	Rogers & Hubbard Special Mixture	Karl C. Kulle, Suffield	5.06	6.15	0.14	4.51	4.37	0.43	8.93	2071
842	Consolidated Special Fertilizer	Olds & Whipple, Inc., Hartford	6.27	7.62	0.63	4.67	4.04	....	4.07	842
888	Climax Fertilizer 5-3-5	The Rogers & Hubbard Co., Middletown	4.46	5.42	0.54	4.07	3.53	....	5.60	888
848	Oats and Top Dressing Fertilizer, 10-3-8	The Rogers & Hubbard Co., Middletown	8.34	10.14	2.33	8.78	6.45	....	8.97	848
750	Tobacco Grower Brand	The Rogers & Hubbard Co., Middletown	5.18	6.30	0.29	3.97	3.68	....	5.50	750
1680	Shoemaker's Swift-Sure Fertilizer, Car 58355	American Sumatra Tobacco Co., Bloomfield	3.47	4.22	1.55	11.10	9.55	0.23	0.57	1680
1691	No. 1 Mixture with Manure	Silberman & Kahn, Hartford	6.55	7.96	0.40	4.43	4.03	0.32	6.71	1691
1692	No. 2 Mixture with Stems	Silberman & Kahn, Hartford	7.33	8.91	0.30	4.88	4.58	0.37	6.95	1692
1693	No. 3 Mixture with Stems	Silberman & Kahn, Hartford	7.07	8.60	0.40	5.08	4.68	0.20	1.21	1693
1859	Old Land Fertilizer	Silberman & Kahn, Hartford	6.95	8.45	0.18	5.00	4.82	0.35	4.19	1859
1860	"New Land" Fertilizer	Silberman & Kahn, Hartford	6.57	7.99	0.18	4.63	4.45	0.32	5.72	1860

TABLE XVII. ANALYSES OF SPECIAL AND HOME MIXTURES—*Concluded.*

Station No.	Manufacturer or Brand.	Place of Sampling.	Total Nitrogen.	Ammonia equivalent to total nitrogen.	Phosphoric Acid.			Potash.		Station No.
					Citrate-insoluble.	Total.	So-called "Available."	As Muriate.	Total.	
	Sampled by Purchaser:		%	%	%	%	%	%	%	
1848	O & W Fertilizer	Silberman & Kahn, Hartford	2.86	3.48	0.28	7.50	7.22	3.72	3.72	1848
2118	Fertilizer	Silberman & Kahn, Hartford	5.91	7.19	0.56	4.19	3.63	0.15	4.24	2118
1895	Olds & Whipple Special Mixture No. 1	M. Silverberg, Ellington	8.18	9.95	....	1.65	....	0.57	18.61	1895
1896	Olds & Whipple Special Mixture No. 2	M. Silverberg, Ellington	8.14	9.90	....	1.70	....	0.27	17.01	1896
1652	Olds & Whipple 5-8-7 Fertilizer with KCL	H. E. Wells, Warehouse Point ..	4.24	5.15	1.07	9.25	8.18	7.35	7.35	1652
1653	Olds & Whipple Grass Fertilizer 6-6-4	H. E. Wells, Warehouse Point ..	4.90	5.96	0.95	7.58	6.63	5.02	5.02	1653
1654	Olds & Whipple Special Fertilizer No. 3	H. E. Wells, Warehouse Point ..	8.13	9.88	0.10	7.94	7.84	0.68	13.49	1654
1655	Olds & Whipple Special Fertilizer No. 4	H. E. Wells, Warehouse Point ..	7.93	9.64	0.10	8.94	8.84	0.60	14.72	1655
1874	Olds & Whipple Special Fertilizer Mixture No. 12	H. E. Wells, Warehouse Point ..	....	....	....	....	....	0.66	14.13	1874
2229	Dahlium (for dahlias) Plantspur Products Co., Ridgefield, N. J.	C. Lewis Alling, West Haven	4.19	....	0.96	3.98	3.02	3.16	3.16	2229

TABLE XVIII. ANALYSES OF

Station No.	Manufacturer or Brand.	Place of Sampling.
	Sampled by Station.	
1494	AAC Pulverized Sheep and Goat Manure. American Agricultural Chemical Co., New York City	Roodner Grain Co., So. Norwalk
1563	Sheep and Goat Manure. Armour Fertilizer Works, New York City	F. A. Bartlett Tree Expert Co., Stamford
1392	Berkshire Sheep Manure. Berkshire Chemical Co., Bridgeport, Conn.	C. Buckingham & Co., Southport
1404	Par Plus Brand Reinforced Sheep Manure. A. H. Case & Co., Buffalo, N. Y.	S. D. Woodruff & Son, Orange
1579	Corenco Sheep Manure. Consolidated Rendering Co., Boston, Mass.	Knowles & Lombard Co., Guilford
1442	Davey Shredded Cattle Manure. Davey Tree Expert Co., Kent, Ohio	R. E. Landis, Sound Beach
1416	"Sheep's Head" Pulverized Sheep Manure. National Guano Co., Aurora, Ill.	Cadwell & Jones, Hartford
1464	Favorite Sheep Manure. Olds & Whipple, Inc., Hartford	Sampled at factory
1477	Groz-It Pulverized Sheep Manure. Pacific Manure & Fertz. Co., San Francisco, Cal.	F. T. Blish Hardware Co., So. Manchester
1533	Premier Brand Poultry Manure. Premier Poultry Manure Co., Chicago, Ill.	Lightbourn & Pond, New Haven
1534	Premier Brand Sheep Manure. Premier Poultry Manure Co., Chicago, Ill.	Lightbourn & Pond, New Haven
1417	Wizard Brand Cattle Manure. Pulverized Manure Co., Chicago, Ill.	S. P. Strople, New Britain
1418	Wizard Brand Pulverized Sheep Manure. Pulverized Manure Co., Chicago, Ill.	S. P. Strople, New Britain
2000	Royster's Sheep and Goat Manure. F. S. Royster Guano Co., Baltimore, Md.	F. H. Woodruff & Sons, Milford
2159	Sheep and Goat Manure. I. P. Thomas & Sons, Philadelphia, Pa.	Ira W. Beers, Hamden

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.	
%	%	%	%	%	%	%	%	%	
1.52	1.85	1.50	....	....	1.00	0.50	3.08	2.00	1494
1.30	1.58	1.50	....	....	1.25	1.00	3.11	2.00	1563
2.14	2.60	2.18	1.60	1.00	1.80	....	2.91	2.00	1392
2.66	3.23	2.25	2.65	0.75	3.30	1.50	2.33	1.50	1404
1.50	1.82	1.50	....	....	1.25	0.50	3.08	2.00	1579
1.96	2.38	1.20	....	....	1.39	1.00	2.15	1.00	1442
2.20	2.67	2.73	1.68	1.00	1.83	1.25	3.33	2.00	1416
1.38	1.68	1.65	....	....	1.14	0.75	3.07	2.50	1464
1.61	1.96	1.80	....	....	0.95	0.75	3.35	3.00	1477
5.64	6.86	6.00	2.82	2.50	3.05	2.75	1.34	1.30	1533
1.84	2.24	2.00	0.88	0.80	1.08	1.00	1.85	2.00	1534
2.01	2.44	2.10	1.05	1.00	1.30	....	1.55	1.00	1417
1.90	2.31	2.43	1.73	1.25	1.88	....	3.44	2.00	1418
1.37	1.67	1.50	1.40	1.00	1.55	....	3.24	2.00	2000
1.42	1.73	1.50	....	....	1.23	1.00	3.59	2.00	2159

TABLE XIX. ANALYSES OF

Station No.	Manufacturer or Brand.	Sampled by
	Farnam Cheshire Lime Co., Farnams, Mass.	
1830	Lime	John F. Luddy, Hazardville
	Lee Lime Co., Lee, Mass.	
2055	Hydrated Lime	Woodbury Co-operative Assoc., Inc., Woodbury
	Miller Lime Co., West Stockbridge, Mass.	
2056	Hydrated Lime	Woodbury Co-operative Assoc., Woodbury
	New England Lime Co., Canaan, Conn.	
1772	Hydrated Lime	T. R. Swanback, Windsor
	Manufacturer Unknown.	
410	Burned Agricultural Lime	Ira W. Beers, Hamden
1363	Limestone	Robt. Coe, Durham
1501	Lime	Chas. D. Lewis, Hartford

LIMESTONE, ETC.

Chemical Analysis.						Mechanical Analysis.					
Lime (CaO).		Magnesia (MgO).		Total Oxides.	Insoluble in acid.	20 mesh.	40 mesh.	50 mesh.	80 mesh.	100 mesh.	Station No.
Found.	Guaranteed.	Found.	Guaranteed.								
%	%	%	%	%	%	%	%	%	%	%	
67.28	....	0.68	....	67.96	....	92.5	62.5	36.5	17.5	12.5	1830
47.39	....	30.35	....	77.74	....	97.5	91.0	57.5	19.0	6.5	2055
59.61	....	2.63	....	62.24	....	....	....	....	....	....	2056
45.61	....	31.35	....	76.96	....	98.9	96.6	89.3	61.1	16.9	1772
40.90	....	28.03	....	68.93	....	89.5	43.0	33.0	16.0	15.5	410
52.94	....	0.54	....	53.48	....	92.5	76.0	64.0	53.5	49.0	1363
33.22	....	1.26	....	34.48	....	....	....	....	....	....	1501

TABLE XX. MISCELLANEOUS MATERIALS.

No.	Material	Nitrogen.	Phosphoric acid.	Potash.	Remarks.
		%	%	%	
2068	Acid Phosphate ?..	....	3.20	0.17	Much CO_2. No water sol. carbonate. Not leached ashes. Probably limestone.
1242	Bone meal	....	....	....	No foreign material detected.
1591	Bone meal.....	....	....	....	For identification.
571	Cattle manure	2.75	0.89	0.99	Moisture 13.93%.
1207	Chicken manure ..	2.36	3.52	1.50	Moisture 21.52%.
1208	Chicken manure ..	0.90	1.18	0.48	Moisture 73.70%.
887	Cotton hulls	0.58	....	....	Ash 2.80; fibre 35.93.
517	Cotton waste	1.45	0.59	1.05	.....
1479	Fertilizer 5-4-5 ...	....	....	....	Appeared to contain castor pomace and cottonseed meal as source of organic nitrogen. Chlorine 1.03%.
210	Fertilizer	....	3.95	....	Avail. P_2O_5 3.82%; moisture 6.38%. Referee sample.
211	Fertilizer	....	3.24	5.15	Avail. P_2O_5 2.91%; moisture 6.25%. Referee sample.
9838	Fertilizer	....	....	....	No salt (NaCL) found.
1019	Fertilizer	....	....	14.10	Check sample. 13.94% by alternate A. O. A. C. method.
913	Fertilizer	4.14	7.97	6.25	.....
1557	Fertilizer	5.06	2.05	10.96	.....
1556	Fertilizer	5.19	2.05	10.99	.....
1960	Fertilizer	5.90	3.47	7.85	.....
387	Fertilizer	5.78	5.78	5.98	.....
1387	Fish, dry, ground..	8.49	....	....	Trace of ammon. sulphate crystal. NH_3 0.18%. Probably accidental contamination.
2150	Material for identification	....	.....	56.07	Muriate of potash. Chlorine much, sulphate trace, nitrate none.
2078	Material for identification	14.76	....	11.36	Nitrate of potash-soda.
1296	Muck	....	....	....	Moisture 4.94%: ash 87.00%; organic and volatile 8.06%.
757	Nitrate of Soda ?..	8.82	6.16	0.64	Not nitrate of soda. Probably mixture of nitrate of soda and acid phosphate.
1847	Nitrophoska No. 3	....	....	....	CaO 0.54%; MgO 0.10%.
487	Poultry Manure ...	5.04	1.93	1.24	Dry, pulverized.
1346	Sewage Sludge ...	0.81	0.28	0.07	Water 56.34%; ash 16.43%; organic and volatile 27.23%.
1347	Sewage Sludge ...	0.70	0.26	0.04	Water 30.00%; ash 52.50%; organic and volatile 17.50%.
1348	Sewage Sludge ...	0.75	0.42	0.05	Water 24.50%; ash 61.96%; organic and volatile 13.54%.
1488	Sewage Sludge ...	1.08	0.54	0.07	Water 45.80%; ash 31.31%; organic and volatile 22.89%.

TABLE XX. MISCELLANEOUS MATERIALS—*Concluded.*

No.	Material	Nitrogen.	Phosphoric acid.	Potash.	Remarks.
		%	%	%	
1663	Sewage Sludge ...	1.92	....	....	Water 4.83%; ash 40.50%; organic and volatile 54.67%.
1300	Sheep Manure	....	....	....	Some acid phosphate present; also limestone and shell; trace of ground bone.
9811	Sheep Manure	....	....	....	Appeared to be genuine. No ammonia sulphate detected.
9813 9814	Soils	....	....	....	Ether extract of soils yellow and fluorescent. Ether residue had appearance and consistency of vaselene. Soils impregnated with mineral oil or grease.
2069	Soil or Humus	0.32	0.10	0.12	Water 27.28%; ash 58.18%.
656	Tankage	3.15	5.94	....	.....
907	Tankage	8.33	11.08	....	Trace of mineral phosphate.
9805	Tankage	3.92	15.75	....	Appeared to be genuine. No ammonia salts detected. Much bone and meat present.
1484	Tobacco dust	0.78	0.35	0.93	.....
1386	Tobacco stems.....	1.18	0.70	3.59	.....

CHLORINE IN FERTILIZER MATERIALS.

Tobacco growers desire to avoid chlorine so far as possible in their fertilizer mixtures and are therefore concerned with the chlorine content of their raw materials. Data obtained in the last two years as well as some obtained earlier are summarized in Table XXI.

Chlorine was extracted with hot water as directed in the method for water-soluble potash in mixed fertilizers, omitting ammonia and ammonium oxalate, and determined volumetrically.

TABLE XXI. CHLORINE IN SOME FERTILIZER MATERIALS.

Material	No. of Samples Tested	Chlorine, Cl., per cent. Range	Average
Ammonium phosphate	2	trace	....
Ammonium sulphate	13	none to 1.4	....
Blood, dried	2	0 3 to 1.4	0.80
Bone, ground	12	trace to 1.2	0.25
Calcium nitrate	1	none	....
Calurea	2	none	....
Castor pomace	4	trace to 0.1	0.06
Cottonseed meal	4	trace	....
Cottonhull ashes	..	0.2[1]	....
Cow manure (72% water)	..	0.1[1]	....
Fish scrap	48	0.1 to 0.7[2]	0.25
Horse manure (66% water)	..	0.1[1]	....
Linseed meal	4	none	....
Potassium carbonate	22	trace to 1.2	0.11
Potassium nitrate	6	0.6 to 1.5	0.98
Potassium sulphate	20	trace to 4.6	2.22
Potassium-magnesium sulphate	2	1.5 to 2.7	1.90
Sodium nitrate	12	0.1 to 1.6	0.56
Sodium-potassium nitrate	6	trace to 0.8	0.41
Superphosphate (acid phosphate)	4	trace	....
Tankage	12	trace to 1.1	0.40
Tobacco stems (20% water)	..	0.5[1]	....
Wood ashes	..	0.5[1]	....

[1] Taken from a compilation by Dr. Jenkins in 1922.

[2] Conn. Exp. Sta., Bull. 250, p. 43, 1923. This is excluding two samples which were found to contain 2.6 and 3.3% of chlorine and which are extraordinary.

ADDENDA, ETC.

Page 11, To the brands registered by Apothecaries Hall Co. add, Tobacco Starter.

Page 14, Frisbie's Top Dresser, 8-6-5, should read 8-6-6.

Page 17, The Rogers & Hubbard Co., 5-10-15 Fertilizer, should read 5-10-5.

Page 18, to the brands registered by F. S. Royster Guano Co. add, Royster's Trucker's Delight.

Page 18, to the brands registered by M. L. Shoemaker & Co. add, "Swift-Sure" Tobacco Starter, 4-10-0.

INDEX