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NEW HAMPSHIRE
AGRICULTURAL EXPERIMENT STATION

DEPARTMENT OF CHEMISTRY

Analyses of Fertilizers

MADE FOR THE
STATE BOARD OF AGRICULTURE

1909

BY B. E. CURRY

NEW HAMPSHIRE COLLEGE
OF
AGRICULTURE AND THE MECHANIC ARTS
DURHAM, N. H.

NEW HAMPSHIRE COLLEGE
OF
AGRICULTURE AND THE MECHANIC ARTS.

NEW HAMPSHIRE
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The bulletins of the Experiment Station are published at irregular intervals, and are sent *free* to all residents of New Hampshire requesting them.

ANALYSES OF FERTILIZERS

The samples of fertilizer for the 1909 inspection were collected by Mr. A. J. Richardson, under the direction of the State Board of Agriculture. Aside from duplicates, one hundred and thirty-eight samples were taken. Nineteen of these were taken from brands that were offered for sale but were unlicensed. These samples have not been analyzed and the names and analyses do not appear in the following list.

The number of brands of fertilizer offered for sale the past year was the largest in the history of the state. If agriculture is to continue in greater favor, the number of brands will gradually increase.

The following schedule of trade values was adopted for the season of 1909 at a meeting of the station directors and chemists for use in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island and New Jersey. These values were made from quotations obtained by consumers, and on the average are somewhat lower than the values of the preceding year.

SCHEDULE OF TRADE VALUES FOR 1909.

	Cents per Pound.
Nitrogen in Nitrates	16.5
“ “ Ammonia Salts	17.0
Organic Nitrogen in dry and fine ground fish, meat and blood, and in mixed fertilizers.....	19.0
“ “ “ fine bone and tankage.....	19.0
“ “ “ coarse bone and tankage.....	14.0
Phosphoric Acid, water-soluble	4.0
“ “ ammonium citrate-soluble	4.0
“ “ in fine-ground bone and tankage.....	3.5
“ “ “ coarse bone and tankage.....	3.0
“ “ “ cottonseed meal, castor pomace and ashes	3.0
“ “ “ mixed fertilizers, insoluble in ammonium citrate	2.0
Potash as high-grade Sulphate and in forms free from muriate or chlorides	5.0
“ “ Muriate	4.25

An examination of the data in Bulletin 223 of the New Jersey Station shows the cost of these unmixed goods in that state. In other words, an inspection of 136 samples of standard unmixed products showed that the fertilizing elements were for sale and were bought in the open market at about the schedule price as fixed above. Twenty samples of nitrate of soda were for sale at such prices that the cost of the nitrogen was 16.56 cents per pound. The average cost of nitrogen in six samples of sulphate of ammonia was 15.58 cents per pound. The average cost of available phosphoric acid in fourteen samples of plain superphosphate was 3.73 cents per pound. Potash in fourteen samples of muriate of potash cost 4.04 cents per pound. In sulphate of potash the cost for three samples was 4.62 cents per pound. The cost of nitrogen in eight samples of dried blood was 19.36 cents, while in dried and ground fish the average cost of nitrogen in twenty-two samples was 20.67 cents per pound.

From data not included in this report it is certain that the materials in mixed fertilizers cost the consumers in New Hampshire from twenty to one hundred and fifty per cent. more than the schedule prices. A large number of brands were offered for sale at such prices that more than half the cost came from sources other than the chemicals they contained. One brand was sold for \$26 per ton, while an equal amount of unmixed chemicals represented a value of less than \$10. On the other hand, when the same values were applied to a different brand offered for \$29 per ton, the chemicals represented a value of approximately \$22. A large number of brands selling from \$26 to \$32 per ton contained less chemicals than could be bought for \$15. The selling price may be no measure of the real value of the goods. These observations are very pointed in so far as they have a bearing upon the purchase of fertilizers. They show how imperative it is for the consumer to scrutinize

carefully both the price and guarantee before placing an order.

Generally speaking, the analyses show no very great deviation from the guarantees. One sample evidently has been misbranded. The samples of one manufacturer showed conclusive evidences of very poor mixing. This introduces an element of unfairness to the consumer. While there is not the least question of the integrity of the manufacturers, it is scarcely fair for one consumer to pay for what another gets.

In many samples the calculations of the mixers have been made with such niceness that the margin of safety has been almost entirely eliminated.

A large percentage of the samples do not come up to the guarantee in regard to the available phosphoric acid. This same observation is made in most of the New England reports. We question why this is so. Is it because some inferior material is used as a filler or drier, or because of some more legitimate reason?

Acknowledgment is made here to Messrs. Waldo Adams and Clearton Reynolds for their assistance in the analytical work.

The analyses of the licensed brands of fertilizers follow. Where deficiencies are found the results appear in block type.

Composition of Commercial Fertilizers Sampled and Analyzed in 1909.

MANUFACTURER AND BRAND.	NITROGEN.			PHOSPHORIC ACID.				POTASH.					
	Inorganic.	Total.		Soluble.	Reverted.	Available.		Insoluble.	Total.	Found.	Guaranteed.		
		Organic.	Found.			Guaran- teed.	Found.					Guaran- teed.	
AMERICAN AGRICULTURAL CHEMICAL CO.													
Bradley's Complete Manure for Potatoes and Vegetables	4.31	.81	5.12	4.95	1.40	3.18	1.15	8.00	.95	8.10	9.00	7.30	7.00
Bradley's Complete Manure Top Dressing, Grass and Grain	1.63	1.61	3.24	3.30	6.75	.85	4.58	5.00	1.25	5.83	6.00	2.88	2.50
Bradley's Corn Phosphate	.89	1.34	2.23	2.00	6.50	.15	6.80	8.00	3.30	10.10	.....	1.67	1.50
Bradley's Eclipse Phosphate	.....	.....	.....	1.25	7.00	.75	8.35	8.00	2.40	10.75	.....	2.15	2.00
Bradley's Grass and Lawn Top Dressing	4.67	.....	4.76	3.91	1.25	4.75	6.00	5.00	1.45	7.45	6.00	2.23	3.00
Bradley's Potato Fertilizer	.51	1.58	2.02	2.06	5.75	2.40	8.15	8.00	2.25	10.40	10.00	3.02	3.00
Bradley's Potato Manure	1.09	1.64	2.73	2.50	1.80	3.18	4.28	6.00	1.60	6.88	8.00	5.32	5.00
Bradley's Seeding Down Manure	.86	1.09	1.95	3.00	4.61	5.25	9.50	9.00	1.60	11.50	11.00	2.11	2.00
Bradley's XL Phosphate	.83	1.87	2.70	3.00	7.35	1.85	9.20	9.00	1.60	10.80	11.00	2.26	2.00
Clark's Cove Bay State Fertilizer G. G.	4.5	1.57	2.02	2.00	6.60	.20	6.80	8.00	2.60	9.40	10.00	1.57	1.50
Clark's Cove Potato Fertilizer	.45	1.95	2.40	2.06	6.60	1.60	8.20	8.00	1.85	10.05	10.00	3.02	3.00
Cleveland Fertilizer for all Crops.	.34	.91	1.25	1.00	7.00	2.08	9.05	8.00	1.00	10.60	10.00	2.12	2.00
Cleveland Potato Phosphate	.46	1.70	2.16	2.06	6.90	1.30	8.20	8.00	2.35	10.55	10.00	3.23	3.00
Cleveland Superphosphate	.35	2.02	2.37	2.06	6.10	2.60	8.10	8.00	2.00	10.10	.....	1.93	1.50
Crocker's Ammoniated Bone	.44	1.96	2.30	2.06	7.00	1.40	8.40	8.00	1.80	10.20	.....	1.85	1.50
Crocker's New Rival Ammoniated Superphosphate	.42	.94	1.36	1.63	4.40	2.65	7.05	8.00	3.45	10.50	.....	2.10	2.00
Crocker's Potato, Hop and Tobacco Phosphate	.91	1.22	2.13	2.06	6.25	1.05	7.30	8.00	2.60	9.90	.....	3.39	3.00
Cumberland Guano	.49	.92	1.41	1.03	4.40	3.45	7.95	8.00	2.45	10.40	10.00	2.12	2.00
Cumberland Potato Fertilizer	.20	2.03	2.23	2.06	6.35	3.15	9.50	8.00	1.65	11.15	10.00	3.16	3.00
Cumberland Superphosphate	.45	2.44	2.49	2.06	4.30	4.45	9.35	8.00	1.15	10.50	10.00	1.78	1.50
Darling's Blood Bone and Potash	1.72	1.71	3.43	4.10	5.35	2.85	8.20	7.00	1.55	9.75	8.00	6.68	7.00
Darling's Farm Favorites	.30	1.81	2.11	2.06	6.25	1.00	7.25	8.00	2.65	9.90	10.00	3.14	3.00
Darling's General Fertilizer	.72	.77	1.49	1.25	5.35	1.10	6.45	6.00	2.60	9.05	7.00	3.69	3.00
Darling's Potato Manure	1.60	1.33	2.93	2.50	4.95	1.50	6.45	6.00	3.00	9.45	8.00	5.22	5.00
Formula C	4.52	.89	5.41	.....	.....	3.05	3.05	.....	2.30	5.35	.....	20.56	.....

Composition of Commercial Fertilizers Sampled and Analyzed in 1909.—Continued.

MANUFACTURER AND BRAND.	NITROGEN.			PHOSPHORIC ACID.				POTASH.					
	Inorganic.	Organic.	Total.	Soluble.	Reverted.	Available.		Insoluble.	Total.				
			Found.			Found.	Guaran- teed.		Found.	Guaran- teed.	Found.	Guaran- teed.	
BUFFALO FERTILIZER Co.													
Stockbridge Special Complete Manure for Potatoes and Vegetables	1.76	1.47	3.23	3.29	6.50	5.50	7.04	6.00	1.40	8.45	7.00	10.51	10.00
Bowker's Sure Crop	.07	1.22	1.29	.82	4.85	2.63	7.48	8.00	1.62	9.10	9.00	3.13	2.00
Bowker's Superphosphate with Potash					7.70	3.80	11.50	10.00	2.50	14.00	11.00	2.20	2.00
COE-MORTIMER Co.													
High Grade Manures	3.92	.33	4.25	3.28	4.45	2.80	7.25	7.00	1.00	8.25	8.00	9.97	10.00
New England Special	.86	1.12	1.98	1.64	6.75	2.65	9.40	9.00	.60	10.60	10.00	5.48	5.00
Top Dressing	4.44	1.32	5.76	5.74	3.15	3.25	6.40	6.00	.60	7.00	7.00	5.95	5.00
COE-MORTIMER Co.													
Ammoniated Bone Superphosphate			1.86	1.85	4.90	2.05	6.95	8.00	.65	7.52	9.00	3.50	3.00
E. Frank Coe's Celebrated Potato Fertilizer	3.75	1.15	4.90	1.65	2.30	8.20	10.50	8.00	.35	10.85	9.00	4.65	4.00
E. Frank Coe's Columbian Corn and Potato	.20	1.04	1.24	1.23	4.95	4.90	9.85	8.50	.65	10.15	9.50	2.06	2.50
New England Corn and Potato Fertilizer	.18	.68	.86	.80	3.40	1.10	4.50	7.50	2.00	6.50	8.50	3.04	3.00
E. Frank Coe's Excelsior Potato Fertilizer	.84	2.16	3.40	2.47	2.00	4.70	6.70	7.00	1.75	8.45	8.00	8.00	8.00
Famous Prize Brand Grain and Grass					3.30	5.55	8.85	8.50	.90	9.75	11.00	1.98	1.50
E. Frank Coe's Special Grass Top Dressing	4.26	.12	4.38	5.40	.50	1.00	1.50	.....	2.70	4.20	3.60	3.43	3.60
PARMENTER & POLSEY.													
P. P. Aroostook Special	.81	2.92	3.73	3.69	5.45	1.80	7.25	7.00	1.20	8.45	8.00	10.96	10.00
P. P. Maine Potato Fertilizer			3.11	3.20	4.65	1.05	5.70	6.00	.95	6.65	7.00	11.40	10.00
P. P. Potato Fertilizer	.21	1.82	2.03	1.64	4.40	2.15	6.55	6.00	1.40	7.94	7.00	5.82	6.00
Plymouth Rock	.29	1.78	2.07	2.46	4.25	3.05	7.30	8.00	3.40	10.70	9.00	4.07	4.00

RUSSIA CEMENT Co.

Essex Complete Manure for Potatoes, Roots and Vegetables.....	.72	2.31	3.03	3.70	3.25	2.95	6.20	7.00	.75	6.95	9.00	9.71	8.50
Essex Al Superphosphate.....	.73	2.64	3.37	3.30	1.00	5.00	6.00	7.00	5.35	11.35	9.00	1.85	2.00
Essex Complete Manure for Corn, Grain and Grass.....	.46	1.70	2.16	2.10	4.35	3.30	7.65	7.00	2.05	9.70	9.50	9.71	9.50
Essex XXX Fish and Potash.....	.29	1.97	2.26	2.00	1.45	10.60	12.05	9.00	2.00	11.05	12.00	2.11	3.00
Essex Market Garden and Potato Manure.....	.56	.76	1.32	1.24	6.35	.32	7.67	8.00	1.25	8.92	10.00	5.08	5.00

LISTER'S AGRICULTURAL CHEMICAL WORKS.

Lister's Animal Bone and Potash.....	.76	.49	1.25	.83	4.40	5.60	10.90	10.00	1.75	12.65	11.00	2.68	2.00
Lister's Ouedia Special.....	1.56	1.88	3.44	3.00	3.85	3.45	7.30	7.00	2.80	10.10	8.00	1.07	1.00
Lister's Potato Manure.....	.80	.79	1.78	1.65	4.00	3.25	7.25	8.00	1.00	9.95	9.00	7.22	7.00
Lister's Special Potato Fertilizer.....	.56	.76	1.32	1.24	3.80	4.55	8.35	9.00	4.00	12.35	.....	2.04	2.00

NEW ENGLAND FERTILIZER Co.

New England Corn Phosphate.....	.18	1.49	1.67	1.64	4.90	2.90	7.80	8.00	2.60	10.40	9.00	3.01	3.00
New England Potato Fertilizer.....	.17	1.52	1.69	1.64	4.10	1.10	5.20	7.00	1.80	7.00	8.00	4.25	4.00

ROGERS & HUBBARD Co.

Hubbard Complete Phosphate.....	.35	1.16	1.51	1.50	3.80	2.25	6.05	7.00	2.90	7.95	8.00	6.80	5.00
Hubbard Grass and Grain Fertilizer.....	.36	2.25	2.61	2.20	.85	8.55	9.40	6.50	7.15	16.55	16.00	.....	12.00
Hubbard New Market Garden.....	.62	1.42	2.04	2.00	3.25	3.45	6.70	6.00	7.45	7.00	9.99	10.00	10.00
Hubbard Oats and Top Dressing.....	4.90	2.10	7.00	8.50	.30	2.50	2.80	4.50	5.60	8.40	8.00	8.62	8.00
Hubbard Soluble Potato Manure.....	3.44	1.79	5.23	5.00	1.00	6.05	7.05	7.00	3.85	10.90	10.00	6.15	5.00
Pure Raw Bone Knechte Flour.....	2.00	2.14	4.74	5.00	.50	4.75	5.25	7.00	5.50	10.75	8.00	11.06	10.00
Soluble Tobacco Manure.....	.86	1.65	2.51	2.50	2.80	3.40	6.20	6.00	3.40	9.60	8.00	9.68	8.00
Soluble Corn and General Crops.....	.81	1.31	2.12	2.00	6.10	3.50	9.60	9.00	1.25	10.85	10.00	5.31	5.00

J. W. SANBORN.

Saunborn's Chemical Fertilizer for Grass and Grain.....	4.10	.76	4.86	5.45	1.70	3.15	4.85	5.00	1.00	5.85	6.00	6.23	6.00
Saunborn's Chemical Fertilizer for Potato and Corn.....	3.44	1.79	5.23	5.15	1.90	5.35	7.25	7.00	.50	5.85	6.00	6.70	6.00
Saunborn's Chemical Fertilizer for use in hill.....	1.94	1.39	3.33	3.50	5.20	1.70	6.90	7.00	2.75	9.45	10.00	10.00	8.00
Saunborn's Chemical Fertilizer for use in hill.....	1.62	.85	2.47	2.50	6.15	2.20	7.50	7.50	3.75	10.65	10.00	7.72	8.00
Saunborn's Chemical Fertilizer for use in hill.....	.49	2.66	3.15	2.50	1.75	3.75	5.50	7.50	3.75	9.25	12.50	4.54	4.00
Saunborn's Chemical Fertilizer for use in hill.....	.49	2.66	3.15	2.50	1.75	3.75	5.50	7.50	3.75	9.25	12.50	4.97	4.00

Composition of Commercial Fertilizers Sampled and Analyzed in 1909.—Continued.

MANUFACTURER AND BRAND.	NITROGEN.				PHOSPHORIC ACID.				POTASH.				
	Inorganic.	Organic.	Total.		Soluble.	Reverted.	Available.		Insoluble.	Found.	Guaranteed.		
			Found.	Guaranteed.			Found.	Guaranteed.					
SWIFT'S LOWELL FERTILIZER CO.													
Empress.....	.15	1.30	1.45	1.23	6.00	1.40	7.40	7.00	1.15	8.55	8.00	2.38	2.00
Swift's Lowell Animal Brand for all Crops.....	.28	2.11	2.39	2.46	4.00	5.00	9.00	8.00	.95	9.95	10.00	4.23	4.00
Swift's Lowell Bone Fertilizer for Corn and Grain.....	.28	1.36	1.64	1.64	6.90	.73	7.63	8.00	2.92	10.55	.....	3.02	3.00
Swift's Lowell Cereal Brand.....	.12	1.06	1.18	.82	5.25	1.75	7.00	7.00	1.10	8.10	8.00	1.91	1.00
Swift's Lowell Potato Manure.....	.24	1.61	1.88	1.64	4.10	2.95	7.05	7.00	1.20	8.25	8.00	4.00	4.00
Swift's Lowell Potato Phosphate.....	1.19	1.27	2.46	2.46	6.85	.72	7.57	8.00	1.70	9.27	9.00	3.89	6.00
Swift's Lowell Starting Phosphate.....93	.93	.82	3.25	2.87	6.12	8.12	2.10	8.22	9.00	4.12	4.00

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New Hampshire

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