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Kilgore, B. W., "Natural plant food, claims made for it and its value" (1898). *Bulletins*. 601.
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*Agricultural and Mechanical
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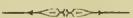
EXPERIMENT STATION,



Special Bulletin No. 43.



**“Natural Plant Food;” Claims
Made for It and Its Value.**



Agricultural College, Miss., Feb. 15, 1898.

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NOTE.—The analysis and inspection of commercial fertilizers is by law done by the Professor of Chemistry in the College, who is the State Chemist. The results being considered of agricultural value are sent out by the Experiment Station. All communications in regard to these Bulletines or analyses should be addressed to State Chemist.

Mississippi Fertilizer Control.

UNDER THE AUSPICES OF THE
CHEMICAL DEPARTMENT OF THE
MISSISSIPPI AGRICULTURAL AND MECHANICAL
COLLEGE.

“NATURAL PLANT FOOD;” Claims Made for It, and Its Value.

By B. W. KILGORE, State Chemist.

SUMMARY:

A fertilizer material under the name of “Natural Plant Food” was sold in the State last season. It was claimed to be the “Best Fertilizer on Earth,” and as a germinator of seed it was declared to have no equal. Great stress was laid on the statement that it was a natural product, and because of this was better than any fertilizer that could be made by man.

All the plant food in this material was claimed to be available, whereas analyses in the Laboratory showed it to contain very little available phosphoric acid, 34.2 pounds in a ton of 2,000 pounds, worth at present prices about \$1.50. The phosphoric acid is the only fertilizer constituent of agricultural value in this material.

In experiments by farmers “Natural Plant Food” gave no apparent increase of crops. Laboratory analyses and field experiments agree in showing this material to have little or no agricultural value.

“Natural Plant Food” is a low grade natural phosphate of too poor a quality to be used in the manufacture of acid phosphates or other fertilizers.

It was sold to farmers for from \$11 to \$17 per ton, whereas it has practically no agricultural value and could be bought at the mines for \$2 to \$3 per ton. The money spent for it was thrown away.

Farmers should apply to this department for information about fertilizers of questionable value before purchasing them.

INTRODUCTION.

During the past season (1897) several car loads of fertilizing material were sold in the State at different points by the American Fertilizer Company of Washington, D. C., under the name of "Natural Plant Food." This company made very extravagant claims for its fertilizer. The statements regarding the analysis and value of the material are ingenious and misleading, in fact, their method of advertising and sale had so many of the ear marks common to the well-known patent medicine methods that no surprise was caused when later in the season it was learned that the people selling the "Cheapest and Best Fertilizers on Earth," as they were pleased to call them, had also a monopoly of the "Best and Cheapest Family Medicine on Earth."

"THE CHEAPEST AND BEST FERTILIZERS ON EARTH."

The following is a fair illustration of the method of advertising and the claims made for the fertilizers:

"Every intelligent farmer knows that fertilizer is the best which can soonest start the seed to growing and cause the largest number of seeds to sprout and grow, out of the whole number planted. This, the Natural Plant Food has done in every case. The Natural Plant Food makes more seed grow, out of the whole number planted, than any other fertilizer on earth. It makes the seed come up much earlier and faster, grow more vigorously, withstand a drouth much longer and finally produce a much better crop than any other fertilizer yet known, as has been fully demonstrated and proven beyond all manner of doubt by tens of thousands of witnesses, to its marvelous germinating and forcing powers. This all goes to show that a natural fertilizer is of vastly more benefit to the soil

than an artificial imitation; for, after all, a chemical or artificial fertilizer is simply an attempt in an artificial manner, to supply the crops with a chemical mixture which is simply an imitation of a first-class natural fertilizer; surely the Almighty is a better chemist than the human race has yet produced and better knows the need of all growing things."

How high sounding and beautiful all this is—on paper! It is calculated to carry one beyond his element in admiration of nature and natural products because they are natural and not imitations.

Like unto the above, on a letterhead, with address, agencies, and other marks so similar that no one would mistake the source being the same as that from which the fertilizer literature came, is the advertisement of the

"BEST AND CHEAPEST FAMILY MEDICINE ON EARTH."

The following is an extract from the postscript of a circular letter sent to an agent, who sold "Natural Plant Food:"

"Although our medicines are the *best on earth*, they cost our customers less than one-half the usual price of other medicines, and are in such great demand that our agents realize for their service two or three times as much money as they could make in handling any other line of goods.

"Ours is truly the greatest discovery ever made in the medical line. We are the sole proprietors of these medicines and the exclusive agency for them should soon enable you with our help, to control the medicine trade in your territory."

It seems unfair, from a material point of view, that one company should be the possessor not only of the best remedy for the ails to which human flesh is heir, but also of the "Best Fertilizer on Earth," for the germination of seed and the growth of plants.

CHARACTER OF BUSINESS DONE BY THE COMPANY SELLING "NATURAL PLANT FOOD."

Notwithstanding the confident claims made by the American Fertilizer Company for its "Natural Plant Food," it seemed disposed not to want it put on sale in the State on the same basis as other fertilizers sold, but manifested a disposition to evade the fertilizer law and to prevent the inspection, analysis, and tagging of their goods.

MISLEADING ANALYSIS OF "NATURAL PLANT FOOD."

Three grades of "Natural Plant Food" are sold by the American Fertilizer Company, Nos. 1, 2, and 3. The analyses of Nos. 1 and 2 as published by the Company are given below:

	No. 1 Per Cent.	No. 2 Per Cent.
Moisture (H ₂ O)	1.78	1.78
Total Phosphoric Acid (P ₂ O ₅)	18.00	21.60
Eq. to Bone Phosphate of Lime (PO ₂ CA ₃) ..	39.24	47.15
Oxide of Lime (CaO)	29.16	29.16
Oxide of Sodium (Na ₂ O)	1.32	1.32
Carbonic Anhydrite (CO ₂) .....		.40
Silicic Anhydrite (SiO ₂) Sol. in Chloridic Acid		9.77
Silicic Anhydrite (SiO ₂), Insol.		9.11
Oxide of Magnesia (MgO)		4.62
Aluminic (AL ₂ O ₃) and Ferric (Fe ₂ O ₃) Oxides		5.14
Total Potash Insoluble (K ₂ O)		1.00
Undetermined Residue	49.74	16.10
Total	100.00	100.00

"ALL PLANT FOOD AVAILABLE TO PLANTS IN THE SOIL."

The above analyses are misleading:

1st. In that they imply that materials like silica, mag-

nesia, carbonic acid, etc., have commercial values in fertilizers, whereas all our soils contain sufficient quantities for the use of plants, and they do not have values assigned to them as do *nitrogen, phosphoric acid, and potash*. These latter constituents are the only ones to which values are assigned in fertilizers, and it would appear that the other materials are added to cause the farmer to believe that they have money values too.

2d. The total phosphoric acid is stated to be equal to so much *bone phosphate of lime*. This statement implies that the phosphoric acid in "Natural Plant Food" is of equal value in agriculture to that contained in bones, whereas it is well known that the phosphoric acid in phosphate rock, as this is, is not of equal agricultural value to that in bones.

3d. The statement that is under the guaranteed analyses "All Plant Food Available to Plants in the Soil" is entirely misleading and a misrepresentation, since experiments with this fertilizer and analyses in this laboratory show that the plant food *in it is not available*.

ANALYSES OF NATURAL PLANT FOOD.

Five samples of "Natural Plant Food No. 1" have been analyzed in this laboratory with the results shown in the table:

Sample Number and Source.	Pounds Phosphoric Acid in 100 of Natural Plant Food.			Sand and Insol. matter in 100 lbs., N. P. F.
	Available.	Insoluble.	Total.	
No. 1, E. D. Gilmore, Amory, Miss.	1.82	16.36	18.18	24.38
No. 2, E. H. Reed, Reform, Miss.	1.20	20.16	21.36	25.27
No. 3, S. M. Tracy.	2.11	22.27	24.38	.....
No. 4, J. D. Hopper, Tiplarsville, Miss. ....	.....	.....	18.26	.....
*No. 5, American Fertilizer Co., Washington, D. C. ....	.....	.....	22.24	.....
Average.	1.71	19.60	20.88	24.82

*This sample was sent from Fernandina, Fla.

From these analyses it is seen that the samples contained an average of only 1.71 per cent of available phosphoric acid, or *34.2 pounds in a ton*, which at $4\frac{1}{2}$ cents per pound—the present value given to available phosphoric acid in fertilizers—would make “Natural Plant Food No. 1” worth \$1.54 per ton.

FARMER'S OPINIONS OF “NATURAL PLANT FOOD.”

Several farmers who used “Natural Plant Food” last year were so disappointed in the yields of their crops that they wrote to this department in regard to it. A representative of this department visited a number of places where the material was sold and from the testimonials thus collected and those obtained by letter, the following opinions are condensed as to the effect of “Natural Plant Food” in the growth of crops.

OPINIONS.

Mr. E. H. Reed, Reform, Choctaw County:

Used 1,400 pounds on cotton and corn, at the rate of 150 to 200 pounds per acre. Used no other fertilizer, but left plots without fertilizer and could tell no difference between the unfertilized and that fertilized with “Natural Plant Food.”

Mr. Sam G. Kelly, Reform:

Used 2,600 pounds on cotton and corn on bottom and hill land; left rows blank in bottom and could tell no difference. On hill it was used with stable and chip manure without any result from “Natural Plant Food.” The other manure showed increase.

Mr. H. T. Brock, Reform:

Used 800 pounds on cotton and corn.

On cotton used about 200 pounds to acre on poor upland and could see no improvement.

Corn.—Used 300 pounds to acre on poor upland between

a plot manured with rakings from the lot at the rate of a half shovel to the hill and one manured with cotton seed at the rate of about fifteen bushels to the acre. The lot manure produced twice as good corn as the "Natural Plant Food" plot on which the corn was hardly worth gathering. The cotton seed plot also did better than the Natural Plant Food; but it was planted later and was caught by drought.

Mr J. E. Norris, Reform:

Used 600 pounds Natural Plant Food on cotton, which gave no improvement, though with stable manure there was a good increase of crop.

Corn.—Left some vacant plots and could not tell the difference between those and the Natural Plant Food ones.

Mrs. Mary Outzs, Mathiston; Webster County:

Used several hundred pounds on cotton, corn, and vegetables. Could see no improvement in any case. On cotton it was used in alternate rows in comparison with stable manure and the difference in favor of the stable manure was so perceptible that passers along the road remarked on it.

Mr. Luke Devore, Mathiston:

Cotton.—(Used three sacks.) Used between stable manure and nothing. Could easily tell the row at which the stable manure stopped, but could tell absolutely no difference between nothing and Natural Plant Food.

Corn.—Used as above with stable manure and nothing. The stable manure made real good corn with heavy ears, while nothing and the Natural Plant Food produced only scrubby stalks with inferior nubbins. On this same land in 1892 a very heavy crop was raised by using fertilizer made by East Mississippi Fertilizer Company.

Mr. James Beacham, Evergreen, Itawamba County:

Used 2,000 pounds mostly on corn at rate of 200 pounds per acre, drilled in furrow with corn while planting; left

vacant plot and used some other commercial fertilizer (Home Mixture); could tell no difference between nothing and "Natural Plant Food," while the other fertilizers gave very marked increase of crop. Soil was poor sandy upland on which 200 pounds of good commercial fertilizer will almost double crop any average year.

Natural Plant Food was also used on potatoes and turnips, and was unable to see any improvement.

Mr. J. W. Mullin, Evergreen:

Used 8,000 pounds at a cost of \$15 per ton when other good fertilizer would have cost \$18. It was applied in drill before bedding at rate of 200 pounds per acre.

Corn.—Tested with cotton seed and nothing; could see no difference between Natural Plant Food and nothing, while cotton seed made big improvement.

Cotton.—Tested beside stable manure, which gave very much better results.

Vegetables.—Used on several kinds of vegetables and could see no improvement. The land is a sandy loam upland which usually responds most readily to a complete fertilizer.

Mr. J. R. Burgess, Nettleton, Lee County:

Used 3,600 pounds at the rate of 200 pounds per acre on cotton and corn; also used other complete commercial fertilizer; and could tell no difference between Natural Plant Food and nothing, while the other fertilizer increased the crop to about double.

The land was sandy upland and fertilizers were drilled in before bedding.

Mr. T. S. Mullin, Evergreen:

Used 600 pounds on ordinary sandy upland and could see no improvement in the crop.

Mr. J. F. Fears, Bristow, Monroe County:

Used 175 pounds at rate of 200 pounds per acre on yellow clay upland and could tell no difference from it and

nothing, while home made fertilizer gave good results. Complete fertilizers usually give good returns on this soil.

Mr. J. M. Kellum, Dido, Choctaw County:

Used 1,600 pounds on corn and cotton on upland and bottom at rate of 100, 150, and 200 pounds per acre applied before and after planting. Cotton seed, stable, and pen manure were used in comparison, and gave good results, though the Natural Plant Food did not seem to pay.

Mr. J. E. Bright, Amory, Monroe County:

Used 200 pounds at rate of 150 pounds per acre on clay land, applied in drill when bedding.

Left no vacant plot, but estimates that Natural Plant Food increased crop about one-third, but only about half as much as stable manure. Natural Plant Food cotton was considerably behind in weed and fruit, and did not give satisfaction.

Mr. J. E. Hopper, Tiparville, Miss.:

Used 2,000 pounds on sandy loam soil. The fertilizer was applied in furrow and bedded on. The yield where "Natural Plant Food" was used was no better than where nothing was applied, while a complete fertilizer (Gossypium) about doubled the yield on the same land. Mr. Hopper states that a car load was used in his section without any returns.

From these *opinions* and from the analyses made in the laboratory it is seen that "Natural Plant Food" has very little if any agricultural value in immediately increasing the growth of crops.

WHAT IS "NATURAL PLANT FOOD."

"Natural Plant Food" No. 1, analyses of which are presented in this bulletin, is unquestionably a low grade natural phosphate, likely Florida soft phosphate. It is too poor a quality to be used in the manufacture of acid phosphate and other fertilizers, and for this reason is put on

the market as a natural product. The phosphoric acid—this is the only plant food of money value in it—in this phosphate is in the insoluble form and there is not enough present to justify manufacturers to treat it with acid to render the phosphoric acid available to plants.

It is to be noted that while the main office of the American Fertilizer Company is in Washington, D. C., the sample sent to this laboratory for analysis came from Fernandina, Fla.

VALUE OF "NATURAL PLANT FOOD?"

As has been seen from the analyses and from the experiments of farmers, "Natural Plant Food" has very little, if any agricultural value or *crop producing power*, and farmers should judge it solely from this standpoint. It has a commercial value of from \$2 to \$3 per ton at the mines, that is, it costs that much to get it out. This material was sold to farmers in this State last year for from \$11 to \$15 for No. 1, and \$14 to \$17 for No. 2, when good complete fertilizers could have been obtained for \$16 to \$18. The money spent for this material was thrown away. Numerous experiments have been made with natural—untreated—phosphates and Florida soft phosphate, and the results have shown, to state it mildly, that these phosphates are remarkably inferior to acid phosphate in crop producing power, and on most soils have given no immediate returns in increased crops.

WARNING TO FARMERS.

So far as "Natural Plant Food" and the American Fertilizer Company are concerned, we scarcely feel it necessary to have sent out the foregoing statement as we believe no more business will be done by this company in this material—certainly not in the sections where "Natural Plant Food" was tried last season. The company may, however, attempt to do business in some nook or corner of

the State where the character of their goods is not known, and where the question of fertilizers is not well understood. Then, too, fertilizers and fertilizing materials of questionable character, patent formulas for making crops grow, and such things will make their appearance on the market now and then, and it is with the two fold view of making the statement about "Natural Plant Food," and of warning farmers against buying fertilizers of questionable character and value that this bulletin is sent out.

There is always a plentiful supply of good fertilizers on sale in the State. It is the duty of this department to protect the buyers of fertilizers in the character of goods offered for sale. Our bulletins, containing information and analyses of fertilizers on sale, will be sent free to any person requesting them. In addition to the bulletins information by letter will be given about any fertilizer or fertilizing material that may be inquired about.