A Cheap Way to use Phosphates.

Prof. S. W. Johnson gives in the N. Y. *Tribune* a method of using phosphates, whether refuse bone-black, Charleston, or other mineral phosphates, ground fine, without the expense of dissolving them in sulphuric acid, by composting them with decaying vegetable or animal matter—best with stable manure He proposes that the farmer, when he collects his manure into piles, or handles it over, shall sift the ground phosphate over and mix with it in the proportion desired to make it efficient as a fertilizer The action of this decaying vegetable matter will be to more or less dissolve the phosphate and render it soluble in water and thus capable of being assimilated by plants. He instances the case of phosphates of a low order applied in France without any effect except upon lands with a large proportion of humus, and here it produced a marked benefit, owing to the solvent power of humic acid found in the soil. He instances the experiments of Dr. Heiden, Director of the Agricultural Experiment Station Pommritz, in Saxony, the result of which demonstates the action of compost, especially of fresh stable manure on native phosphates:—

On the 30th of May, 1870, he made three compost heaps, as follows:—

1. 10 cwt.* of phosphorite, 10 cwt. of dung heap liquor, and 36 cwt. of soil
2. 10 cwt. of phosphorite, 20 cwt. of dung heap liquor, and 36 cwt. of soil.
3. 10 cwt of phosphorite, 10 cwt. of stable dung liquor, and 36 cwt. of soil.

The phosphorite contained but fourteen and one-half per cent. of phosphoric acid and fifteen and one-half per cent. of oxide of iron, and was accordingly none of the best. The heaps were shovelled over July 28, and remained until March, 1871, when they were worked over again. In July, August, and September, 1871, they were also each turned and mixed, the last time very carefully, and finally were used to manure the rye field. Each compost was applied broadcast to a Saxon acre, equal to one and three-eighths English acres. The fields were ploughed, and on Oct. 6 the rye was sown. Unfortunately the acre that was intended to remain without manure was manured with twenty tons of stable manure The remainder of the field, two and one half Saxon acres, received eight cwt. of bone-dust, and three cwt. of ammoniated superphosphate, containing nine per cent. each of nitrogen and of soluble phosphoric acid. The yield on the three trial plats and the average yield of the remainder of the field, as well as the gain of the former over the latter, were as follows:—

	Yield of Grain	Gain
Trial plat 1.....	2,781 lbs.	469 lbs, or 20 per cent
Trial plat 2.....	2,851 lbs.	539 lbs., or 23 per cent.
Trial plat 3 ...	2,993 lbs.	680 lbs, or 30 per cent.
Field.....	2,312 lbs.	

The greatest gain was in the use of compost, with stable manure, and was thirty per cent. above the crop manured with stable manure and superphosphate. In two other trials the uncomposted phosphorite, applied to oats and potatoes at the rate of ten per cent. per acre, showed no perceptible action.

Each of the trial plats received 160 lbs. average of composted phosphoric acid. The two and one-half acres treated with bone and superphosphate received, per acre, eighty-four pounds of phosphoric acid in the bone, and twelve pounds of soluble phosphoric acid in the superphosphate, or a total of ninety-six pounds The acre dunged with stable manure received from ninety to 100 pounds of phosphoric acid, of which one-third was soluble in water, judging from Voelcker's analyses. The experiments are, therefore, decisive, and, taking the increased crop into account, show that 160 lbs. of phosphoric acid in composted phosphorite had the same effect as was exerted by 120 to 130 lbs of phosphoric acid in the bone-dust and superphosphate, and in the stable manure.

The result of these trials is so strong evidence of the fluxing power of stable manure that I should anticipate that farmers would often find it advantageous to prepare special composts, after the pattern given by Dr. Heiden, for use on soils or crops requiring an active phosphatic fertilizer

But if this mode of using phosphates shall prove satisfactory for ordinary crops, it will not supersede the use of the dissolved or acid phosphate for root crops, and especially turnips. The acid phosphate has a rapidity of action that puts the turnips past the fly, and renders it a certain crop. And any crop that requires a rapid growth, and to which phosphate is a stimulant, will be more successful with the superphosphate than with the slow-acting pulverized phosphate, which will depend upon the solvent powers of vegetable and animal matter in compost or the soil.

* The cwt, 100 lbs avoirdupois

Experiments with Oats.

Professor Daniels gives the following results of experiments with different varieties of oats last season on the Experimental Farm of Wisconsin University:

Comparison of Varieties

Adjacent plats of one-half acre each were sown, May 27th, to the following varieties, two and a-half bushels of seed to the acre:

Birlie

One bushel of seed weighed 39 8 lbs. Harvested August 26th. The straw was very rusty, and contained no grain. The very heavy rains of late June injured them.

Goldenian

Weight of one bushel seed, 31 2 lbs. Harvested August 9th Weight of straw and grain, 1,798 lbs. Weight of grain, 185 lbs. Weight of one bushel, 34 lbs. Yield per acre, 11 6 bushels. Percentage of grain to weight of straw and grain, 10 3 One pound seed yields 4 7 lbs.

Black Norway.

Weight of one bushel of seed, 31 4 lbs. Harvested August 14. Weight of straw and grain, 2,268 lbs Weight of grain, 460.5 lbs. Weight of one bushel, 27 lbs. Yield per acre, 30 bushels Percentage of grain to weight of straw and grain, 20 63 One pound seed yields 10.7 lbs.

White Norway.

Weight of one bushel seed, 29.6 lbs. Harvested August 14th Weight of straw and grain, 1,914 lbs. Weight of grain, 318 lbs Weight of one bushel, 27.5 lbs Yield per acre, 19 9 bushels. Percentage of grain to weight of straw and grain, 10. One pound seed yields 8.6 lbs.

White Schonen

One bushel of seed weighed 26 4 lbs. Harvested August 14th Weight of straw and grain, 1,972 lbs. Weight of grain, 548½ lbs Weight of one bushel, 26 lbs, Yield per acre, 34¼ bushels. Percentage of grain to weight of straw and grain, 22 2. One pound seed yields 16 6 lbs.

Mixed

This seed is the product of the mixture, in 1871, of equal parts of Black Norway, White Norway, Surprise, and common oats. One bushel seed weighed 28 lbs. Harvested August 13. Weight of straw and grain, 1,598 lbs Weight of grain, 339 5 lbs. Weight of one bushel, 28 lbs. Yield per acre, 29 2 bushels

Probstein.

A plat containing 105 square rods was sown May 26th. Weight of one bushel of seed, 30 lbs. Harvested August 12th Weight of straw and grain, 1,818 lbs Weight of grain, 514 lbs. Weight of one bushel, 29½ lbs Yield per acre, 24 3 bushels. Percentage of grain to weight of straw and grain, 28.27. One pound seed yields 8 8 lbs.

Surprise.

Sown at same time, upon a plat of same size as that sown to Probstein. Harvested August 13th. Weight of straw and grain, 2,078 lbs. Weight of grain, 337½ lbs. Weight of one bushel, 30 lbs. Yield per acre, 16 bushels Percentage of grain to weight of straw and grain, 16 1. One pound seed yields 5.82 lbs.—*Ohio Farmer.*

Managing Stiff Clay Soil.

While clay is the best soil we have for the production of grass, it cannot be made profitable for continuous cropping like sandy land, sand loam or even clay loam. After two or three plowings it becomes compressed, heavy and comparatively unproductive, unless considerable pains is taken to keep it up Clay soil gets into a condition that is considered sterile, many times, when it has not lost its fertility, but becomes too much compressed to allow the circulation of air through it, and the roots of vegetation to ramify and take up the nourishing elements it contains. Heavy clay should then have the benefit of long or coarse manure when under the plow, and should be worked with special care to make it mellow and loose. We believe that more land of this nature has been injured by being plowed too wet than from any other one cause, and this one damaging influence should be obviated let circumstances be what they may. If the spring is too wet to permit plowing at any other time than when the soil is wet enough to stick to the plow, or when moulded into any form by the hand will remain so, give up the crop intended to be grown upon it, and leave the land undisturbed, or use it for a later crop.

We once had a heavy piece of clay land that would produce abundantly when well worked up, but the labor expended to raise a crop was fully equal in value to the crop received, and it was resolved to try an experiment Sand and creek washed gravel was drawn, and a piece of about half an acre covered to the depth of three or four inches. Top of the gravel was put a good coating of dried plaster from the walls of a large public building that was being repaired; over this a coating of leaf mold and the whole plowed in, cross plowed and thoroughly mixed up with the soil, and the result was the land became heavier, stiffer and less productive than before. The combination of the sand loam and lime appeared to make a cement, and harden the whole mass After successive fall plowing and winter exposures, the soil became submissive and productive, but the experiment was not a paying one. Have experience coarse manure plowed under and fine manure harrowed in at the surface brings the best results, where any fertilizers or invigorators are used, but the best course of all is, to always produce from sod land; that is, never keep a piece under plow until it becomes heavy; by a proper course of alternating between fields and frequent seeding down, goods crops may be raised with much less labor and expense and much less manure than the course too generally adopted—continuous plowing and manuring.—*Ohio Farmer.*

Experiments with Fertilizers.

For five years past the Cirencester (Eng.) Chamber of Agriculture has been conducting a series of experiments upon the comparative value of the different commercial manures. At a late meeting of this Association, Prof. Wrightson made a long and apparently exhaustive report with a summary of the results of these experiments, which we find published in full in the *Wilts and Gloucestershire Standard.* The tables of results are too long for our columns, but we give a condensed summary, which may be of value to those of our readers who use the commercial fertilizers mentioned. The crop grown in 1873, was turnips (Swedes); the experiments were made on twelve different farms, on widely different soils, and of course the separate results were different. The tables do not state of what kind of soil the different plots consisted, so than a general summary is all that would be of value here. The manure in all cases was drilled in with the seed.

	Kind of Manure used	*Product per Acre.* Tons.	lbs.
1	Peruvian guano, 3 cwts per acre	13	240
2	" " dissolved, 3 cwts. 60 lbs. per acre	14	1,100
3	Mineral superphosphate, 3 cwts. per acre,	15	700
4.	{ Mineral superphosphate, 3 " " Peruvian guano, 3 " "	17	280
5	{ Mineral superphosphate, 3 " " Organic matter, ½ " "	15	1,100
6.	{ Mineral super, 3 cwts., potash salts, 1 cwt., Nitrate soda, ½ cwt. organic matter, ½ cwt.,	16	384
7	{ Organic matter, ½ cwt; nitrate soda, ½ cwt; Potash salts, 1 cwt	10	868
8.	Unmanured plots	9	820

The number of turnips per acre were counted, and the effect of the different manures upon germination was very plain. No. 1, in which guano alone was used, had only 9,940 plants to the acre, while No. 2, on which the guano was put in solution, had 900 plants more on the acre. The unmanured plot—No. 8—had 14,640, and No. 3, which was manured with superphosphate only, had 16,360 plants to the acre. The size of the turnips was greatest on plot No. 2, while No. 1 and No. 4 were just a little less. From this it appears that while the guano killed a portion of the seed in germination, yet the size of turnips was so much more increased that the yield was the largest in No. 4; and taking all the plots upon which guano was used, as against all the rest, the guano was the best manure for turnips. The average weight of turnips on the guanoed plots was 2.73 lbs. each, while on the plots manured with the superphosphate it was 1.9 lbs. The average on the unmanured was 1.33 lbs. The average on No. 6, where potash was used, was 2.1 lbs.; the number of plants to the acre was 15,740. The yield of No. 6 was second only to No. 4.—*Country Gentleman.*