

acre) of Thomas's phosphate powder and 12 centners of kainit or 4 centners of potassium muriate (potassium chloride) per hectare (equal to 4 cwt. of kainit per acre or $1\frac{1}{2}$ cwt. of muriate of potash) to a poor meadow which is only yielding very feeble crops of grass and wild herbage, &c. You will find that quite a different vegetation will be developed; even in the first summer after this treatment has been introduced. Vetch-like and clover-like plants, which otherwise only show themselves on rich meadows, and hitherto had not been observed upon the meadow in question, spring forth in vast quantities, they will develop well, and if in the following year the same manuring is repeated, then the poor and barren meadow will be converted into one thickly set with clovers. It will become a rich one, and will yield nourishing hay instead of the previously hard, herbaceous, inferior fodder.

This is no imaginary experiment; it has already been made by thousands of farmers during recent years with the best

cheapest of all supplies of nitrogen—the nitrogen of the atmospheric air.

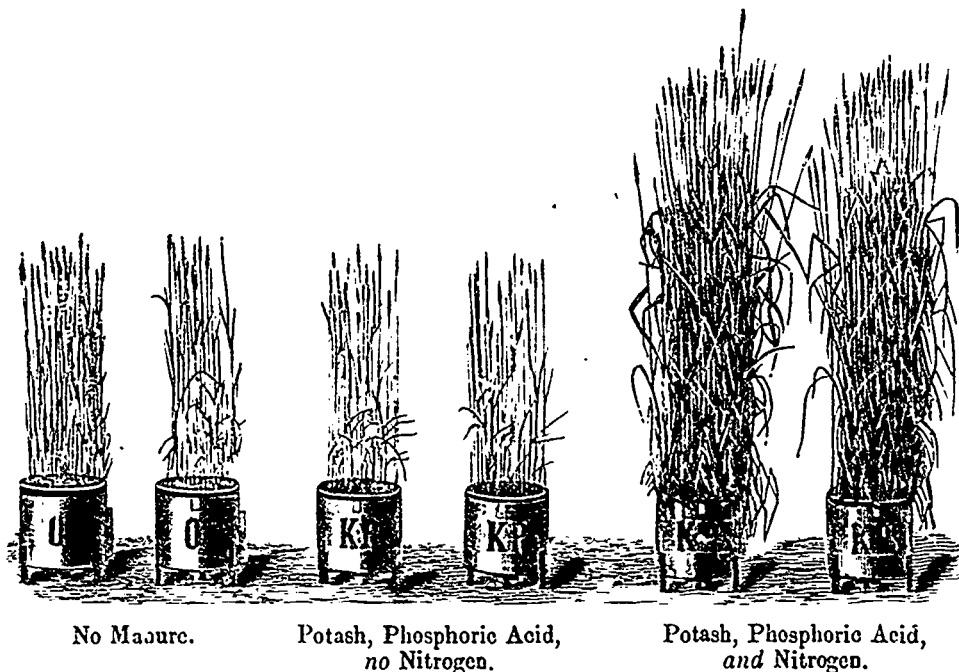
I have had prepared photographic representations of some of my cultivations, and ask you to inspect them. Table I, will illustrate to you experiments made with vetches.

You see how very feebly the plants have grown without manuring, how luxuriantly, on the other hand, they have developed after a dressing with phosphoric acid, and how this dressing, without any addition of nitrogen, has already been sufficient to produce a maximum harvest.

An addition of nitrogenous salts only gives rise to a quite unimportant increase in yield. A dressing with salpêtre and ammonia salts may therefore be regarded as a worthless extravagance on clover, lucerne fields, &c. Nevertheless Table II. presents to you quite another picture.

On the same soil and under exactly the same conditions as we employed when growing vetches, summer wheat was cul-

TABLE II.—EXPERIMENTS WITH POTASH AND PHOSPHORIC ACID ON WHEAT.



results, which have frequently been incredibly favourable, and, perhaps, all of them have already satisfied themselves sufficiently that an enormous increase in yield can be obtained by manuring meadows in the autumn and winter with potash and phosphoric acid.

I quote this experiment to you because it shows us, in such an extremely feasible manner, in which way and by which means we can bring ourselves to participate in the great advantages offered to us by the store of nitrogen in the atmospheric air. We manure leguminose with an abundant dressing of phosphoric acid, and, when necessary, with potash, for we know that the more rapidly plants satisfy themselves with potash and phosphoric acid so much the greater is the avidity with which they assimilate the atmospheric nitrogen and elaborate it into the harvest substance. We know well, and we experience daily anew, how a liberal dressing with phosphoric acid and potash will increase, in an extraordinary manner, the yield of peas and beans, of vetches and lupins, of clover fields and meadows.

Phosphoric acid and potash are the means which are placed at our disposal to render accessible to leguminous plants the

activated. Manuring with potash and phosphoric acid alone, without any addition of nitrogen, produced no effect in this case. It was only when nitrogenous salts were also employed that any action was evident.

In order to present to you the final results of this experiment in a tangible manner for you to investigate with your own eyes, I have put the yields of grain obtained in glass cylinders and place them row before you for inspection.

The cylinders contain:—

- No. 1 — 82 grams = to 2.9 oz. of vetch corn
Obtained without manuring.
- No. 2 — 703 grams = to 24.6 oz. vetch corn
Obtained after potash and phosphoric acid.
- No. 3 — 724 grams = to 25.4 oz. of vetch corn
Obtained after potash, phosphoric acid and nitrogen
- No. 4 — 25 grams = to 0.8 oz. of wheat
Obtained without manuring.
- No. 5 — 22 grams = to $\frac{3}{4}$ oz. of wheat
Obtained after potash and phosphoric acid.
- No. 6 — 466 grams = to 16.3 oz. of wheat
Obtained after potash, phosphoric acid and nitrogen

It is therefore evident that phosphoric acid and potash are