

duced yields of 41 to 55 bushels of corn as an average of the years 1902, 1903, and 1904, while with no potassium applied, no ear corn was produced.

"On the University of Illinois soil experiment field near Momence (Kankakee County), on peaty swamp soil, potassium produced an average of 44.6 bushels of corn for 9 years, while without potassium the average yield was only 3.6 bushels.

"There is no more profit in starving plants than there is in starving animals. While heavy application of potassium must sometimes be made at first, with proper management only light applications will be required after a few years."

CONCLUSIONS

The Norfolk Southern Farms project is a well conceived practical plan for the reclamation of a large area of swamp land. Without the intervention of men of large affairs, without the assistance of capital and organization these fertile acres must forever lie barren.

The advantages which the project presents to the farmers who will settle the tract are:

1. Land at moderate price and on easy terms;
2. Facility and economy with which land may be cleared;
3. A climate pleasant to live in with abundant rainfall and long growing season;
4. The advantages of expert advice and instruction in the growing of crops and raising of livestock;
5. Excellent artesian drinking water;
6. Excellent markets for produce;
7. The advantages of cooperation in securing best prices and a steady market.

This undertaking is primarily and fundamentally one of reclamation. It is not unnatural that the soil will need some attention chemically as well as physically to bring it to its highest state of productivity.

The chemical analysis shows that the soil does not contain the mineral elements of Phosphorus, Potassium, Calcium and Magnesium, in proportion to its Nitrogen and Organic Matter. This does not mean, however, that it is lacking in four-fifths of the essentials of a soil. The two most expensive constituents of a soil are Nitrogen and Organic Matter both

of which this soil contains in abundance.

While it takes seasons to add these constituents, the addition of the mineral elements may be made in fertilizers quickly and easily. The problem of building up soils is a long one chiefly for the reason that run-down soils generally lack both Organic Matter and Nitrogen, and these can only be restored economically on a large scale by plowing under legumes grown for their Organic Matter and Nitrogen. Such a process naturally requires the time since one must wait an entire season for a crop to grow. Until Organic Matter is restored to the soil, the mineral elements added in fertilizers are not available for plant use so that results from fertilizer application (available forms excepted) must await the time when the Organic Matter has been added and has decomposed, sufficiently to liberate the insoluble mineral elements. This soil is very abundant in Organic Matter and Nitrogen.

If Dolomitic Limestone is available, Calcium and Magnesium may be cheaply added to the soil. Such limestone should be obtained and applied at a cost not

over \$3 00 per ton. As an average of 18 years' experiments, the Ohio College of Agriculture received \$6 20 net profit from every dollar invested in rock phosphate; as an average of four years, Indiana received \$3 41 and at Urbana, Illinois, \$7 00 worth of rock phosphate paid back \$11 80 the first four years, \$16 19, the second four years, and \$26 97 the third rotation. Conclusions are obvious.

In regard to Potassium, there is more difficulty since the war has increased the price of Potassium salts to a point where they cannot be economically used for agricultural purposes. Until present conditions are relieved in this respect, manure and straw will have to substitute.

Moisture, that great essential to maximum crops, insufficient or unevenly distributed over so large a part of our country is here assured in such quantity and at such time as to contribute fully to ward crop development.

While the Government, the railroads and the State colleges have well established and effective bureaus for disseminating useful information to farmers, full advantage cannot be taken of these facilities by the small land tiller. He is either too busy or too remotely located to apply to and receive from these institutions the information which he should have. Again these bureaus can only advise in a general way, they have not the machinery for making a comprehensive study of the problems of individual farmers.

On the Norfolk Southern Farms through cooperation and organization the soil, crop, tillage and livestock problems will be given the specific attention which their perfect solution requires.

The lone farmer is at a distinct disadvantage in the marketing of his product. No one realizes this better than the farmer and no argument is necessary to show him the advantage of selling cooperatively in quantity through a competent market expert.

This project is undoubtedly the pioneer of many to follow. Reclamation on a large scale, tillage following scientific methods, management through cooperation are measures which must be applied to crop raising as similar methods have been to other industries.

In a project of this kind the personality behind its inception and promotion is of the utmost importance. Only a man of power, enthusiasm, energy and foresight can bring such a plan to its full consummation. The Norfolk Southern Farms project has such a man at its head.