

CONSERVATION OF PLANT FOOD.

Conservation of Plant Food is a broad and important subject, one that scientists have worked at for years and one that is becoming more important each day. Farmers and all who work with the soil are taking the matter up; even the children in our public schools should be taught something on this topic, if we are to keep our name of being a great agricultural country.

As we look at Holland, Denmark and England, we see that they are getting as good and in many cases better returns from soil which has been worked hundreds of years, than we are from soil which has been worked for a much shorter period. They keep the soil in good condition by supplementing in proper amount the food the plant requires. We must do the same or in a few years we shall find the soil becoming "run out."

This paper will deal with general theories and practical illustrations.

The question is: how shall we raise crops without impoverishing the soil?

Our soil is a good rich soil, as good as that of Denmark or Holland. Why then are they getting better returns than we?

Because in many cases we take the soil as Nature gives it, and use it year after year, without adding plant food in sufficient quantities, until we notice a falling off in the crops, whereas in Denmark and Holland the soil is not only thoroughly cultivated, but kept in good condition.

Some methods which should be used for keeping soil fertility:

1. By experience we know that a Rotation of Crops is beneficial. For example: take two pieces of land of the same size, value and quality. On one grass is grown for 18 years, while on the other we use the following Rotation: 1st year, Hoed Crops (as potatoes, turnips, etc.); 2nd year, Grain Crops; 3rd and 4th years, grass and clover, and 5th and 6th years, pasture. At the end of the 18 years we find the second piece to be in better condition than when the test was begun, consequently it is of greater value, as well as having given greater profits. On the other hand the first piece was in poorer condition, yielding smaller crops than at first. "All work and no play makes Jack a dull boy," and this applies to soil as well as to Jack.

The reasons that a Rotation of Crops is profitable are: First, it clears the land of weeds. 2nd, it breaks up soil particles and gives a better chance for root growth. 3rd, thorough cultivation exposes the soil to oxygen and bacteria, which helps to form Nitrates, also to Carbon which unites with water to form Carbonic acid, which dissolves mineral combinations and sets free Potassium, another valuable food.

2. Live Stock Farming. Live Stock Farming is

the growing of plants to feed animals to secure manure to grow other plants. By analysis we know that manure contains a large percentage of the three most important plant foods: Nitrogen, Potassium and Phosphorus, and by experiment we know that unless manures are taken care of they lose in value. The loss in one ton from exposure of manure is of Nitrogen 41.60 per cent; Potassium, 20.76 per cent., and Phosphorus, 20.47 per cent. This loss amounts to \$4,000,000 a year in New Brunswick, or just now the value of 300,000 barrels of flour (\$13.50). These losses are caused by not having proper equipment in the stables to prevent leaching (one-half, one-third loss here), and fermentation (one-half value loss of organic and one-third N. value). The plant food which goes off in the air or down a brook to the river is a total loss.

The growing of hay and grains for market is a good way of lowering soil fertility.

3. On the roots of clovers, vetches and peas we find specialized machinery for the storing, shipping and collection of Nitrogen. The growing of these legumes adds 50-100 lbs. of Nitrogen per acre to the soil, and enriches it in humus forming material.

4. Application of Lime. It has been shown that lime added to a sour soil neutralizes the acid and makes it sweet. A sweet soil is essential in the growing of legumes. An application of lime will give an increase of 1 ton per acre in the growing of legumes.

5. By the application of sea weed or kelp we are supplying the soil with Potassium. The great potash beds in Germany were in all probability formed from this sea weed, and since the war the price of potash has risen from 4-40 cents per lb., and is practically unobtainable at this price. A way of solving this difficulty is the use of our own natural resources. Again by the application of a fertilizer made from fish waste we get Nitrogen from the flesh and Phosphorus from the bones. When bones of higher animals are ground and worked into the soil we get a phosphate that is slowly soluble. By experiment it has been shown that the effects of an application of ground bone Phosphate will be noticed for twenty years.

Now to summarize our statements:

Plant food is conserved by

1. Rotation of Crops.
2. Live Stock Farming.
3. Proper care Manures to prevent loss plant foods.
4. Application of Lime neutralizes acid and puts soil in good condition.
5. Growing of Legumes supplying (Nitrogen).
6. Use and application of our Natural Resources.
 - (a) Sea weed supplying (Potassium).
 - (b) Fish waste supplying (Phosphorus).

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