

Short Talks About Fertilizers.

A READING COURSE.—By E. E. MILLER.

XIII.—HOW TO TELL WHAT FERTILIZER YOUR SOIL NEEDS.

THE FARMER who has carefully read the preceding articles in this series, will understand that there are several things to be considered in regard to the fertilization of any crop before he goes to buy fertilizers for it.

He will remember, in the first place, that fertilizers are used to supply food for the plants, and that until it is dissolved in the soil-water no one of the elements of plant food, which we supply in fertilizers, can be used by the plant. He will remember that it is only in certain forms that any of the plant foods can be absorbed by the soil-moisture and that these foods are changed largely to these soluble forms by the action of the soil bacteria. These bacteria, he will remember, get their food largely from decaying vegetable matter in the soil and thrive best in soils that are loose, well drained, warm, and with a fair supply of moisture.

Soil Fertility Depends Upon Humus As Much as Plant Food.

He will remember that in a very dry season large quantities of plant food may lie in the soil perfectly useless to the crop, because there is not enough moisture in the soil to dissolve it so that they can be taken up by the soil. In a very wet soil, on the other hand, the excess of water will prevent the circulation of the air which is so necessary if the soil bacteria are to thrive as they should. In short, he will remember that soil fertility depends as much or even more upon the condition of the soil as affected by the supply of humus and moisture, than upon the actual amount of plant food in the soil.

It will be, of course, equally necessary for him to remember the three plant foods which we buy in fertilizers and their special uses:

- (1) Nitrogen, whose special office it is to promote the growth of stalk and leaf and add vigor to the plant.
- (2) Phosphoric Acid, which is especially important in developing the fruit and seed and in promoting earliness.
- (3) Potash, which adds strength to the stalk, color and flavor to the fruit, plumpness to the grain and is of special importance in the process of development.

Of course, he will remember also there are large amounts of all these plant foods in the poorest land and the purpose in buying fertilizers is to supply these foods in a form more readily available than they are to be found in the soil.

With these general principles in mind, he will be ready to begin the study of the special needs of each of his crops on his particular soil. He can form a general idea as to what each plant most needs and the sort of growth it makes on his land and he should be able, if he studies his

soil at all carefully, as every good farmer must, to judge with fair accuracy as to the physical condition of his soil and its ability to make good use of the fertilizers he may supply.

Some Indications of Soil Needs.

1. If his soil is what is commonly called rich and the plants grow tall, strong, and of rich green color, he may be sure that there is an abundant supply of nitrogen present in his soil.
2. If the plant makes poor growth, fruits heavily—that is, if his cotton sets many squares on small stalks or his oats and wheat bear heavy heads on short stems, he may be assured that there is at least a fair supply of phosphoric acid present and that the principal need of his soil is for more nitrogen.
3. If his crops lack general vigor, if his cotton rusts, his fruit is of poor quality and his corn makes spindly stalks and poorly filled ears, he will have strong reason to suspect, especially if his land is light and sandy, a deficiency in the supply of potash.

Of course, he cannot expect the best results from any fertilizer on the land that is sour or water-logged or that is dry, hard and gritty, running together and baking when it becomes dry.

What Ten Experiment Plots Will Teach You.

He will understand too, that on most soils there is very often more than one of these plant foods and that while he can form a general idea from the growth of his crops, he must make careful comparative tests, to acquire accurate information as to which plant food is the most needed and in what quantities.

Various methods have been outlined for making these fertilizer tests. One of the most accurate is to divide an acre or half-acre into ten equal portions, as follows:

- Plot No. 1. Plant without any fertilizer.
- Plot No. 2. Nitrogen should be applied at the rate, say, of 15 pounds—100 pounds nitrate of soda.
- Plot No. 3. Apply 25 pounds potash 50 pounds muriate or 200 pounds kainit).
- Plot No. 4. Phosphoric acid at the

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rate of 25 pounds per acre (about 156 pounds 16 per cent acid phosphate).

Plot No. 5. Here both nitrogen and phosphoric acid will be used.

Plot No. 6. Nitrogen and potash will be used.

Plot No. 7. Both potash and phosphoric acid will be applied.

Plot No. 8. All three of these elements are used.

Plot No. 9. Here, too, use all three elements, but only one-half the quantity as in No. 8.

Plot No. 10 is left without fertilization as a check.

To make such a test of any value, the soil in all the plots must, of course, be as nearly uniform as possible. Each must be planted and cultivated in the same manner and the product of each carefully weighed or measured. Then, too, the cost of the fertilizers and the amount of increase in the crop must be calculated before any one can form an idea as to which fertilizer will pay best on his soil.

Test Thoroughly Without Jumping at Conclusions.

It must be understood that on the same soil different results will be (Continued on Page 170.)

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