

and (3) so that they will be attracted to learn and to put the lessons into practice.

The dairying service of the Department has been useful in that way through the Dairy Illustration Stations. These have been object lessons which the farmers could readily see and copy from.

A similar system, suited to illustrate,—that is to make clear,—the relative productiveness of different varieties of grains, of roots and of fodder plants, would be readily accepted and acted upon by the farmers.

The quality and quantity of crops which would be obtained on the same land, in the same season, from different methods of tillage, might be illustrated in such a way as to quickly cause nearly all the farmers who saw them to put the best methods into practice on their own farms.

Local Organizations to Co-operate.

To accomplish that, I would recommend that some local organization of farmers, such as a farmers' institute, an agricultural society, or farmers' club, should provide an "illustration field," or "illustration station," to be used in the way and for the purposes indicated. In any county where one of these organizations was not disposed to do so, I would propose that the county council, or the township or parish council, should be assisted to provide a small "illustration station." No property need be purchased, and there would not be any necessity for engaging a local superintendent on salary. From ten to twenty acres of suitable soil should be arranged for. It should be fairly uniform in character, situated near a market town, beside a public road, and, where practicable, close to a schoolhouse.

The farmers' institute, or other local organization, might arrange with the farmer occupying the land to conduct the "illustration work" according to directions which would be furnished from the Dominion Department of Agriculture. The illustration field for a county need not be permanently in one locality. The illustrations might be given in one place for a year or two, and then in some other locality, after they had served their purpose in the first place.

The Government Should Provide the Plan and the Seed.

The Dominion Department of Agriculture should provide the plan in general and in detail. For each locality it should aim at the accomplishment of something definite, in introducing varieties of seeds, methods of cultivation, and improvement in the fertility of soils. The work to be carried on at each "illustration station" or field should be directly adapted to furnish information to the farmers on what would be useful to them in their district at once.

The plan should be simple and clear, in order to make it as effective as possible in affecting the practice and products of the neighborhood. For instance, one-fourth of an acre each of four different varieties of oats might be grown side by side. The rule should be to grow not more than four varieties of any one kind of grain. One-eighth of an acre might be grown each of four different varieties of carrots and of four different varieties of potatoes.

For illustration of different methods of culture, one-quarter of an acre of some suitable variety of Indian corn for fodder might be sown broadcast; one-quarter of an acre in rows two feet apart, with the seeding quite thick in each row; another fourth of an acre with the corn in rows three feet apart, and cultivated according to the best known methods; and a fourth one-quarter of an acre with the corn three feet apart, but left uncultivated. Such an illustration of methods of corn-growing would result in a general adoption by the farmers of the best methods. Similar illustrations should be given of methods of cultivating other crops.

The Dominion Department of Agriculture should provide the seeds, and compensate the occupier of the land, who would be Superintendent of the Illustrations, for the expense incurred in the extra labor of sowing and cultivating the comparatively small plots.

I estimate that the expense to the Government for the seeds and such compensation for labor would amount to from \$50 to \$100 per "Illustration Field," according to the size and work.

This would be a means of obtaining a large measure of volunteer service from a great number of leading farmers, in spreading information in a thoroughly practical way throughout the localities in which they lived.

Travelling Inspectors and Lecturers.

A practical farmer with a good knowledge of business methods, and ability to express himself clearly in writing and in public speaking, should be secured as travelling inspector and lecturer for each group of twenty or twenty-five "Illustration Stations." The information which they would gather at these stations during the summer would furnish most useful material for meetings of farmers held to discuss agriculture during the winter months.

I estimate that if one hundred "Illustration Stations" were in existence in Canada at suitable centres, each would be visited during the year by from 500 to 1,000 farmers, who would examine the work carefully for the purpose of learning all that could be transferred into the management of their own farms.

The Klondike Would not Be in It.

I think by that means the quantity of crops could be increased at least twenty-five per cent. from the same acreage, without extra expense, within ten years. That would mean an annual increase of wealth for all time afterwards; and the educational value of the "Illustration Stations" to the farmers themselves and their families would go on growing in a manner that cannot be estimated in dollars and cents. The annual value of the crops from the farms in Canada is estimated variously at from 220 to 270 millions of dollars. In a few years the increased value of the farm crops traceable to these "Illustration Stations" would amount to so many millions a year that even the Klondike would not be in it, by comparison, as a means of enriching the people of Canada.

Estimate of Costs.

I estimate that the expenditure to be made by the Dominion Government for giving effect to this scheme would amount to from \$100 to \$300

for each station, including the administration and the travelling inspectors and lecturers. In the course of three years there might be an "Illustration Station" in each county.

For the encouragement of those who sought to excel in carrying on the work, the Government might arrange to award a gold medal to the superintendent in each group of stations who conducted the work in every respect in the best way. Silver and bronze medals might be given to the others in the order of merit.

Then a special Provincial medal might be provided for the most successful superintendent in each province, and also one grand Dominion medal and diploma, which would confer great honor on the one fortunate enough to win it. These would cost very little in proportion to the good they will do.

Pigs and Poultry to be Included.

After a few years, the plan might very well include methods for increasing the fertility of soils by the growth of such crops as clovers, peas, beans, etc.

It would not be desirable to take up any illustration work with live stock in connection with these stations, except, perhaps, with pigs and poultry. With modifications to suit the nature of the work, the plan could be applied to the establishment and maintenance of "Illustration Stations" for these two branches of live stock; and very great benefits would result from illustrating the best methods of selecting breeds and of rearing, housing, and feeding them.

NOTE.—The Department of Agriculture is very desirous of having the above scheme fully discussed by those interested and the columns of FARMING will be open for this purpose, and we trust our readers will give us their views for publication.—EDITOR.

PROPER DISTRIBUTION OF FERTILIZERS IN THE SOIL.

It may not be considered an important matter by many who use commercial fertilizers, as to how much opportunity they give them to dissolve and distribute their fertility where all the roots of the crops can get it, but it is a matter which should receive the most careful consideration by all farmers, and be carefully worked out, practically, on every farm where these manures are used.

It is a very common practice, when planting potatoes, corn, and other crops that are usually cultivated in hills or close drills, to put all the fertilizer in the hills or rows. When we come to think of the very small space that a fertilizer so placed will occupy when even entirely dissolved, compared with the space the roots occupy, the folly of the plan can easily be seen. If we were to put a handful of almost any commercial fertilizer in a potato or corn hill at planting time, it would need to be dissolved before it could be of any service to the plants when they grow. How much water would be needed to properly dissolve it? Perhaps a thousand times more in measure than the fertilizer. We cannot live upon clear molasses, nor upon oil, nor upon any other equally concentrated food alone. No more can a plant live upon solutions of nitrogen, phosphoric acid, and potash, that are more than five hundred times

stronger than they should be. The human system would soon have a disease that we call indigestion or dyspepsia. And why may not plants have indigestion? Indeed, these solutions are so strong in some cases that they actually cause the death of the tender plantlets. Even seeds may be killed by the caustic character of the strong acids and alkalis that come in contact with them.

But while a part of the soil may be overcharged with fertilizing material, by far the larger part is needing it. When we think of how far the roots of our crops extend; how they permeate every inch of the soil, in most cases, in their search for moisture and food, it is very easy to see how needful it is that the food should be there for them to lay hold upon. Not only does the plant need enough to start it in the growth while the roots are yet all in the hill, but it needs it all the way through life.

There need be no fear that the fertility will be lost by being scattered throughout all parts of the soil, that will finally be within reach of the roots. They will find all in due time, and it will be much better for the crop in the end than if it were all put where the roots may reach it in the first few weeks of their growth. The feeding area of the roots is greatly increased as the season advances. I have seen whole surface soils of a corn field so netted with tiny rootlets after cultivation had been stopped that a small knife blade could not be run into the ground without cutting some of them, and the same thing is true of most potato fields, if properly cultivated.

The fruit grower needs to do some thinking on this same line. The roots of his trees and vines go all over the ground, and in many cases the orchard trees and other things are planted so close together that they interlock in their hungry chase for moisture and fertility that they have a noiseless but no less real war underground. It is the survival of the fittest, indeed, and oftentimes, none of them survive very well.

Not long since, when lecturing to farmers' institutes in western New York, I saw a few of about as foolish attempts at manuring orchards as one could imagine. There were piles of farmyard manure over two feet high carefully placed close to the trunks of the trees. It reminded me of what my friend, Prof. L. H. Bailey, once said of the absurdity of this practice, that it is like putting a feed of oats in a sack and then tying it to a horse's leg, instead of putting it in his manger. The manure will in time spread its fertility somewhat, but it can never do the good in such a position that it could if scattered at once where the feeding roots are. The same is true in principle of commercial fertilizers. Scatter them where they will be needed, instead of putting an excess in a few places and none elsewhere. They are easily dissolved, especially nitrogen and potash, as they are usually found. Failures to get good results are often rightly chargeable to such unwise applications as have just been described, and in some cases, actual damage has occurred. Feed the crops liberally but as wisely as you would your animals.

H. E. VANDEMANA.