



Gathering the Apple Crop in the Orchard of Mr. Galbraith, Bayfield, Ont.

Commercial Fertilizers

Dr. J. B. Dandeno, Bowmanville, Ont.

THE use of commercial fertilizers has been one of the most baffling questions with which the farmer and fruit grower has had to contend. If the application of commercial fertilizers to the land had generally resulted in success, there need be very little said, because they have been in somewhat general use for a quarter of a century or more. It is easy to find farmers who are not loud in their praises of such fertilizers, and the reason is they have not always been a success. Millions of dollars are spent annually in the United States, and hundreds of thousands in Canada for commercial fertilizers, and it is safe to say that at least half of this large amount is wasted, not because the fertilizers have, or have not, certain elements in their composition, but because they are not always suitable to the land to which they have been applied.

There is generally an erroneous notion regarding infertile soil, exhausted soil, or over-cropped soil. The prevailing idea is that such soil is infertile because it lacks plant food (I have never met a man who could give a fair definition of "plant food") whatever that is. This is, in nearly all cases entirely wrong. Soil is infertile because of something it has, rather than because of something it lacks. Plant excretions are the chief cause of infertility, and it is the decomposition of such material and the application of fertilizers of any kind that is of value. Commercial fertilizers may remedy such conditions but, in the majority of cases, they do not, and cause a loss and waste of time.

To apply a commercial fertilizer with prospect of success at least, three things are necessary. First, a knowledge of the effect of the previous crop on the soil; secondly, a knowledge of the crop now to be grown and its relation to the excreta of the previous crop, and thirdly, a knowledge of the biology of the soil.

Up to the present these things are only very vaguely known, consequently the use of commercial fertilizers is more or less like the use of patent medicine. The defect is only occasionally remedied.

Moreover, many of the commercial fertilizers in the process of manufacture have been heated to a temperature so high as to be destructive of all bacterial life. Such are of very doubtful value. In the sale of and in the inspection of commercial fertilizers, the chemical composition is usually given, i.e., so much phosphoric acid, so much potash, and so much nitrogen, as if the value depended upon these things. The value depends chiefly upon whether the original bacterial life has been preserved, and whether the constituents of the fertilizer are favourable to the development of nitrifying bacteria of the soil, and to those organisms which prey upon plant excretions.

Certain fertilizers are adapted to certain crops and to certain soils, and the only way to find out which, is to try them by using them on part of the field so as to compare.

Another common error is that organic matter is taken in by the plant roots. As a matter of fact, roots absorb inorganic matter and water, but no organic

matter, excepting possibly in the rarest cases or under the most peculiar circumstances. There is no question as to the benefit to be derived from barnyard manure, and this is not because it contains "plant food" (for you could carry in your vest pocket all the "plant food" that a load of barnyard manure contains), but because it always supplies abundant favorable bacteria and abundant nutritive material for them. It has also a neutralizing effect on all plant excreta and it produces in the soil a good physical condition relative to the water supply.

No mistake is made in applying barnyard manure or other excreta, but in buying and using commercial fertilizers, "patent medicine chances" are taken.

Setting Trees *

P. E. Angle, Simcoe, Ont.

The problem to be solved when setting trees is to set the trees straight and in their exact position in the cheapest possible manner; and to do it in such a way that the men doing the work cannot go wrong.

There are several systems which may be followed. Among these are the following:

Mark out the field with a plow by plowing furrows both ways and planting the trees at the intersections. This is a good plan for one man to work, but where a number of men are depended upon there is enough chance for error that the trees in all probability will be very uneven in the rows, because there is a space about six inches square at each intersection in which the tree may be planted. It is also difficult to plow a perfectly straight line through the field. This system is not recommended on a large scale.

The stake system and planting board is another method. By a system of sighting and measuring, a stake is placed in the position that each tree will occupy, and the planting board is used in order to have the tree in the position occupied by the stake. The system is subject to inaccuracies owing to the placing and replacing of so many stakes, and also entails a good deal of extra labor.

The sighting system is one by which a row of stakes, properly measured, is placed around the field and two rows at right angles to each other across the field. The position of the tree is then obtained by sighting in line with two stakes on at least two sides of each tree; that is, the two lines will meet at right angles where the tree is to be planted. This is a difficult method to get absolutely correct, and may require extra men to sight if those doing the planting are incompetent.

In the wire system the wire should be

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