

that has a wheel in front is the best implement with which to break up the pea land. There is no danger of it shying out when it comes to a hard spot. But whether the preparation has been a barn-yard manured fallow clover or peas turned in as a green manure, which is practically a summer fallow, a clover sod or pea land, the two most important points are to *keep the fertility near the surface* and work up a *fine seed bed* about three inches deep, so that the young plants will get a quick start in the very first stage of their existence. A lumpy, rough, knotty surface is a poor preparation for wheat. The cultivator, disc harrow, roller and smoothing harrow frequently used will bring the soil into a fine tilth, making it loose and friable, so that the plant food will be made available in the best form for the young wheat. I am now preparing in this way three fields, viz., summer fallow, inverted sod and pea land.

2. I have not used any commercial fertilizers, but keep up the fertility of the soil with barnyard manure, clover and peas as green manure. Clover sod and pasture sod, with thorough surface cultivation, have given me very profitable results during the past twenty years.

3. The best time to sow is the first week in September, but if the land is strong and rich, and has been well worked, it may do as late as the tenth, but late wheat seldom gives very satisfactory results. It has not vitality enough to stand the cold winds and frosty nights of April and May, and is much more liable to rust than that which has been earlier sown.

4. The wheats that have given me the best results during the past fifteen years have been the Martin Amber, Clawson, Garfield, and Dawson Golden Chaff.

5. As to seed, I buy after new wheat has passed the experimental stage, and has proved itself a productive field cropper. I continue to sow it until some hardy new variety is introduced, when I again purchase. Sced grain should be properly cleaned with the fanning mill, and all small and shrunken grains sifted out, and nothing but the full, plump seed sown. With seed thus judiciously selected and changed from one kind of soil to another, there is not much danger of deterioration. I know this from close observation and practice. I work two farms a mile apart, the one a productive clay, the other a gravelly loam. The seed is seldom sown two years in succession on the same farm, but changed from the one to the other.

As to the probable yield of the 1899 crop of fall wheat, this is rather a difficult question to answer, for large areas were ploughed up; much that was left was seeded to grass. Around the fences the wheat was good, but in the centre of the fields nothing but hay. In fact, some farmers mowed over a ton per acre out of the middle of the fields, leaving a wide strip of good wheat around the fences. I think the wheat that was left will average about fourteen bushels per acre.

D. C. ANDERSON.

Rugby, Simcoe Co., Ont., Aug. 11th, 1899.

Commercial Manures and Wheat

To the Editor of FARMING:

I think you take too much for granted when you intimate that our farmers will cease growing wheat to a considerable extent. This wheat-growing movement has now got all the way around the globe, and we find that the older countries which abandoned it because the then west was producing more cheaply, have now taken it up again. The reason for this is, no doubt, the increasing demand for wheat created by the growing population of the earth. Now, unless we can grow wheat in the Pacific Ocean we have about got to the extremity of "Western wheat lands." We must now turn our attention to increasing the yields per acre or we will be in a fair way to illustrate Sir Wm. Crook's direful prediction.

Referring to the five answers to your second question in reference to wheat "Have you used commercial fertilizers on

this crop, and if so with what result?" I beg to offer some criticism which I trust will be taken in a friendly spirit.

Mr. G. H. Brodie says: "No, land rich enough." If he is growing the largest possible crop of the best wheat, which can be procured at a paying rate and leaving the land still as well able to reproduce, he has an ideal condition. I think he should tell us how much wheat he grows to the acre, both maximum and minimum crop year by year.

Mr. G. J. Gaston says, "It will not pay. They cost too much." I think he too should give us statistics of his wheat crops, and include present cost of production and profit. Also he should be more explicit as to what "cost too much." He is too well informed a man, I take it, to go it blindly, so he should be able to give us some valuable information on his own experience in manuring with things which "cost too much."

W. C. McGregor says, "We have never used commercial fertilizers." This being a plain statement of fact, I would ask him to give us statistics of his wheat yield for several years if possible, and also to tell us if his crops are quite satisfactory as to quantity and quality of grain and ripening and stiffness of straw.

John Douglas says, "I have never used commercial fertilizers on fall wheat, as I consider nothing is better than barn-yard manure, and always sow plenty of clover in all your land."

No better sources of nitrogen are known to agriculture than farm-yard manure and clover, and the condition of humus resulting from the decomposition of these materials in the soil cannot be duplicated by anything else. But while these manures tend to give large yield and even heavy straw, they alone will not produce either the largest amount the best grain or the best condition of straw. Commercial manures can never properly take the place of these valuable manures, but as to producing the best, and particularly to inducing the grain yield, phosphate is necessary in much greater quantities than they supply, a pure available phosphate should be added to the land.

E. J. Pearson says, "I have not myself, nor do I know of any of my neighbors, who have used commercial fertilizers on fall wheat, therefore cannot give an opinion on the results," and so he speaks for his neighborhood.

It is to those gentlemen who have had no experience in the use of any forms of commercial manures I would speak. They will get their experience sooner or later, and in doing so they will do well to keep in mind these few facts:

(1) Commercial manures are aids and not the whole manure of a field.

(2) In using them you aim to provide the want of the crop not sufficiently supplied by the farm manures.

(3) There are four very important substances required for every crop—nitrogen, potash, phosphoric acid and lime.

(4) The two first are well supplied by farm yard manure and the first one by clover, if the clover is itself well supplied with phosphate and potash.

(5) The two latter, phosphoric acid and lime (together, forming phosphate), are in poor supply in the farm yard manure, and the well-known deficiency of the soils in phosphoric acid, and often even in lime, nullifies the beneficial action of clover.

(6) To get a full crop, then, you must have plenty of nitrogen, but to get the most and best grain you must have even an excess of phosphate. The wheat ash shows over 76 per cent. phosphate, and if you aim at producing the best as well as the most you must not neglect so important an element. The straw on, the other hand, must have attention, and we find it takes nearly all the potash of the crop.

Now that we have proof that seventy to eighty bushels of wheat can be grown profitably by so phosphating the land as to have an excess of phosphate, nothing less should be our aim. If you can double your wheat yield and improve the quality of your roots and grass for several years by the addition of phosphate *in conjunction with* your barn manure and clover, will it pay? Weigh it up!

Toronto, Ont., Aug. 11, 1899.

F. C. WALLACE.