THE CANADA FARMER.

VOL. XII.—No. 4. PUBLISHED MONTHLY. } TORONTO, CANADA, APRIL 15, 1875. { $1.00 Per Annum. SINGLE COPIES TEN CENTS.

The Field.

Growing Barley Many Years in Succession.

In last month's CANADA FARMER we wrote upon the culture of barley, and the reasons why that grain should be a still more important crop to our farmers than it now is. As we write, no reliable tidings have reached us of the state of the winter wheat, but judging from such scattered items of information as we have been able to glean, it does not seem probable that that grain has suffered so much as to seriously influence prices. We have therefore before us, and shall have, unless some improbable, widespread disaster should occur to the growing wheat, a likelihood that wheat will not reach a figure high enough to make its growth the most profitable way in which the farmer can expend his time and labor. This will doubtless cause many farmers to sow barley where spring wheat would have been sown. To such farmers, a few particulars of late experiments by the celebrated English farmer, J. B. Lawes, of Rothamsted, will be valuable. He has grown barley by the aid of artificial manures, on the same land for many years in succession.

The first experimental barley crop was in 1852; and the land has been under barley ever since. Thus, in 27 years, there have been grown one crop of clover, one of wheat, and 25 of barley; the last 23 of which have been under careful experiment. Excepting on one plot, no dung or animal manure of any kind, has been applied to the land during the whole of that period. To one plot of land there was applied, per acre, superphosphate of lime alone; this plot gave an average crop for the 23 years, of 24¾ bushels per acre. To the second plot were applied, per acre, superphosphate and 200 pounds of ammonia-salts (or 275 pounds of nitrate of soda, which contains the same quantity of nitrogen); this plot yielded 49 bushels per acre. To the third plot was applied, per acre, the same as to the second plot, and, in addition, sulphates of potass, soda and magnesia; the plot yielded 48¾ bushels. The fourth plot received, per acre, fourteen tons of farm-yard manure, and it yielded 48¾ bushels per acre.

Mr. Lawes points out the striking fact that small quantities of artificial manure should give, over so long a period, as much barley as fourteen tons of farm-yard manure, and he then explains points of distinction and similarity between the two kinds of fertilizers, thus:—

In round numbers there have been removed annually, in corn and in straw, about 2¾ tons of produce per acre. Deducting from this the moisture it contains, there remain about 46½ cwts., or rather more than 2¼ tons of dry or solid substance removed annually; and deducting from this again the mineral matter and nitrogen it contains, there remain about 44 cwts. of non-nitrogenous vegetable, or combustible substance. In the dung very much more than this amount of vegetable matter has been returned to the land every year, but in the artificial manure none. Here, then, we have two parallel experiments, extending over a period of twenty-three years, in one of which much more than the total amount of non-nitrogenous or carbonaceous organic matter than was contained in the crop, has been annually returned to the land, and in the other none, and yet the produce is equal in the two cases.

Now, I would ask, whether you think it possible that such a soil as mine could stand such a drain as this for twenty-three years—or for twenty-seven, if we go back to the last application of dung—without showing a marked decline in the produce, if the plant depended upon the supplies of non-nitrogenous vegetable matter within the soil, or if that contained in the dung was at all essential to the result. The conclusion is, I think, obvious, that under the influence of the superphosphate of lime and ammonia-salts or nitrate of soda, the growing barley was able to obtain its non-nitrogenous organic matter, amounting to more than 90 per cent. of its total dry or solid substance, from the atmosphere, and not from the soil.

You will not fail to see the great importance of recognizing this fact, when you are told that you may depend upon artificial manures to grow more frequent corn crops. Artificial manures contain but little, and the best of them no carbonaceous organic matter. If, therefore, they were active only so long as the plant could obtain sufficient organic matter from the soil, each succeeding corn crop would cause a reduction of the condition of the soil, which could only be restored by the dung-cart. If, on the other hand, the organic matter is supplied by the atmosphere, the repetition of corn crops by means of proper artificial manures may increase, rather than diminish the condition of the land.

If we deduct from the 14 tons of dung its water, its carbonaceous organic matter, and the extraneous mineral matter (soil, sand, &c.) which it always contains, there remains scarcely half a ton of mineral and nitrogenous matter A good deal of this mineral matter is comparatively worthless. Of nitrogen there is about four times as much as in the 200 lbs. ammonia-salts, or in the 275 lbs. of nitrate of soda. But as the artificial manure and the dung have given equal crops, it is obvious that a given amount of nitrogen applied in the artificial manure is much more effective than the same amount supplied in dung.

There is one essential mineral constituent of a barley crop which is supplied in dung, but not in the mixture of superphosphate of lime and ammonia-salts or nitrate of soda. This is potass The crops grown by this artificial manure must, therefore, have obtained it from the soil itself. Of potass, the average crop of corn and straw has removed from 30 to 35 lbs. annually. It is obvious that, up to the present time, my soil has been capable of yielding the quantity required.

The dung has supplied about 1½ cwt of potass annually or about 34½ cwts. in the twenty-three years; and in the experiment No. 3 the sulphate of potass has supplied an average of about 1 cwt. annually, or about 23 cwts. in the twenty-three years. Yet neither the dung, nor the artificial manure containing potass, has given more barley than experiment No. 2 without potass. What may be the resources of other soils in potass it is not for me to say It is, however, not at all likely that any farmer will grow corn and remove both the straw and the grain, for so many years in succession from the same field as in my experiments, without bringing the dung-cart into it; and I may remark that if the straw had been returned to the land, I might have taken more than fifty crops of barley in succession, without taking from the soil as much potass as I have done up to the present time.

The same kind of argument is applicable, but in a higher degree, in the case of silica. The straw of a barley crop contains about five times as much silica as the grain, so that if the straw were periodically returned to the land in the form of dung, the exhaustion of that substance would be more gradual than that of potass. So also with other constituents.

Mr Lawes then shows by tabular statements that the quality of his barley steadily increased during the time the experiments were being carried on. For the first eight years it averaged 51 pounds per bushel; for the second eight years, 54¼ pounds per bushel; and for the third seven years 55½ pounds per bushel. It is probable that the increase is in great part due to more favorable ripening seasons during the later years. But whatever may be the cause, it is clearly shown that when barley is grown by proper artificial manures, even for many years in succession on the same land, it does not deteriorate in quality. The barley grown by superphosphate alone showed a marked decline during the last half of the 23 years. That grown with the other applications produced more during the latter than the first half of the period.

Corn.

Saving Seed, Breaking ground, Cultivation, &c,

EDITOR CANADA FARMER:—On a recent tour through the Dominion, I noted, among other things, the scarcity of what ought to be one of our most important crops, namely Indian corn, and I want to make a few remarks about the possibility of its profitable culture in the Dominion, and I will commence with a few hints about securing the seed.

It has been, for some years past, my custom to secure my seed with the greatest care, for without reliable seed no satisfactory results can be obtained. This is my way of securing it:—Go into a field of desirable corn just when the husks on the earliest ears are beginning to turn yellow. These, as a general thing, will be the largest and most perfect ears. With a knife, sever the ear with all the husk from the stalk.

The next important thing to having good seed, is to have it saved in good condition until wanted for planting. This is done by stripping back only enough of the husk with which to hang the ear, leaving the remainder in its natural position on the ear Hang the corn in some dry loft, as in the woodhouse, or at the top of the barn. Some persons will say, in the loft of the corn crib, over the corn is just the place for that. But, not so, that is one of the worst places in which to attempt to save the seed and expect it to retain its vitality, which vitality is, of course, essential to its germination. The corn-crib is a bad place, for the reason that it is just where it will receive the steam and gases from the sweating corn beneath, which are injurious to the seed. Many have noticed, in taking seed corn from the top of the pile in the crib, that it would not grow, but on digging down into the same, seed was obtained that would germinate more satisfactorily. But noxious gases are not all that is to be guarded against. A rat and mouse-proof position is very desirable, and that is obtained by attaching wires of a suitable size to the rafters or other convenient support for the corn. To these wires are suspended in a horizontal position, two poles of proper size and of any desirable length. On these are placed smaller poles, on which the ears of corn are hung in twos, by tying two together and hanging them across these last-mentioned poles, taking care always that the whole structure is far enough from all parts of the building, and connected only by the wires, so that rats and mice can not jump to it. By doing this the seed-corn is safe so far as location and security against rats and mice are concerned.

It is advisable thus to secure a great deal more of the corn than will probably be wanted. As it must be assorted, and only the very best taken for seed—it will be but a small proportion of all that was saved; but all that which may be rejected as seed, is good stock to have on hand. All sound corn thus treated is of the best quality for domestic use, for homing and family meal, for the reason that corn, thus treated, retains the sweetness and moisture so characteristic of new corn. But let good seed and plenty of it be the main object, as the neighbors will want some, especially when they come to understand with what care and judgment it has been saved.

A neighbor of mine, and a practical farmer, said to me on a certain occasion, when he became aware that his crop was a failure on account of bad seed:—"Such seed as you planted would have been cheap to me at twenty dollars a bushel, for I depended on bad seed and failed of a crop, whereas good seed would have made a good crop."

On breaking the ground, if flat or level, it should be laid off in lands twenty-eight feet wide, which will give seven rows four feet apart, but, if sufficiently rolling to need no surface-drains, should be ploughed in one piece by throwing the furrow slice first outward and then inward at every alternate ploughing. If sod, it should be ploughed not to exceed three inches in depth and be thoroughly cultivated and pulverized before planting, by harrowing four to six times. This will thoroughly pulverize the surface and place the plant-food used by the corn in the most available position.

This theory of shallow ploughing is not a very popular one, I know, but, in support of it, I will give a case or two and some reasons why I think it the best mode. There is a case on record of the Washington Co., N.Y., Agricultural Society, who appointed a committee to examine a crop of corn raised by J. W. Dickey, of West Alexander. The committee report one hundred and fifty-five bushels per acre. Ground, an old sod broken two and a half to three inches deep, well turned over and harrowed six times before planting, and cultivated five times after. A case in my own experience:—In 1860, I cleared off a piece of thirteen acres of new ground. I hired some of it ploughed, and I got, as I thought, a very poor job, very shallow, and "cut