

doubt, other ends served by the process, but this is the chief one. The principal cause of the infertility of the soil is the want of a due proportion of available phosphoric acid. The manures which have been proved to possess the most ameliorative effect on exhausted or naturally inferior soils, are those which contain a large proportion of phosphoric acid. In view of these facts, phosphorus is seen to be of the deepest interest to man, whether he live by cultivating the soil or the mind.

Guanos, and the other numerous varieties of artificial fertilizers, which are now employed as auxiliaries to farm yard manure, are valued in proportion to their percentage of ammonia and phosphoric acid, but it should be borne in mind that the quantity of ammonia contained in the soil and atmosphere is practically almost unlimited, whilst the proportion of phosphorus, contained even in the best soils, is very small, and is, after the most laborious treatment, rendered useful. Every addition of ammonia to the soil, aids in the solution of the mineral matter, and enables the plant to draw, as it were, in advance, upon the resources of the land. Thus, whilst the compounds of phosphorus enrich the soil and directly contribute to the wants of vegetable life, ammonia chiefly acts as a solvent of the saline and other mineral constituents; in fact, whilst in the majority of cases, the continued application of Peruvian Guano, sulphate of ammonia, and other ammoniacal manure, is but a constant aid to the crops to exhaust the soil, a liberal application of phosphoric compounds makes a positive addition to the soil's fertility.

The Turnip and its Cultivation.

"Country Gentleman" Prize Essay

BY J. G. SNELL, EDMONTON, A. S.

I am going to give you my experience in turnip culture during the last ten years, on my father's farm. I shall not attempt to give positive proof that it is a profitable or paying crop, but I cannot understand how any one that keeps good stock, and pays attention to pushing forward young animals, can well do without them. It is true that if all the labor that must be expended in its cultivation be taken into account, it is one of the most expensive crops we raise, if not the most expensive, but it leaves the land in first rate condition for growing future crops of any kind. For it must be well manured to produce a good crop of turnips, and it must be so well cultivated that all grasses and weeds are effectually killed. We can do more injury to Canada thistles by cultivating turnips than by any other course. We get a larger amount of good, succulent feed for stock from the same quantity of land than we can of any other crop. We make an immense pile of excellent manure to keep up the farm, and our stock is healthier and better for a liberal supply of roots. Besides all this there is more real pleasure in working among and watching the growth and progress of a field of turnips than can be derived from any other crop; it is really fascinating, and we consider it by no means an uncertain crop; in ten years we have never failed to get an average crop. This year, 1861, in spite of the most severe drouth that the "oldest inhabitant" has ever experienced, we have cultivated twenty-six acres, and never had a better crop. I am quite certain that they will average 900 bushels per acre. This is considered a good crop, but as high as 1,200 bushels have been grown in Canada. In this, as in the cultivation of any crop, a great deal has to be learned by observation and experience—sometimes dear bought experience.

A good crop of turnips may be obtained without the use of artificial or expensive manures, by using only good barnyard manure; by this I do not mean the kind of manure generally used by our farmers, such as rotten straw and the droppings of animals that have been fed on straw, but manure made from animals that have been well fed. I think the best time to apply the manure is in the fall, spread and ploughed under. In this way it keeps the soil open and loose during the winter, and becomes thoroughly mixed with it. But if it is not convenient to apply it in the fall, manure that has been composed during the winter, and is well rotted, can be applied in the same way in the spring. But perhaps a better way to get immediate benefit from the manure is to open out drills and spread the manure in the drills, then close them and sow upon the top. This mode requires more labour, but will perhaps pay for it in the

crop, as the manure is directly under the plants, and must have a good effect. If the land has been ploughed in the fall, as it certainly should be, it need not be mowed again till most of the spring work is through, about the last of May, when it should be ploughed, harrowed and rolled, then let lie for a week or two, so that any seeds of noxious weeds that may be present will have time to sprout; the land should then be thoroughly worked with the plough, harrow, cultivator and roller, till it is fine and loose; a fine seed bed is of the greatest importance. If the land is of a character that will bake, it should never be worked while wet.

The best way to prepare the land for sowing is to mark it out in drills from 26 to 30 inches apart. I think the latter distance preferable, and for this purpose a double mould-board plough is a great advantage. A roller should be passed over the drills, lengthwise before sowing; this flattens the drills and makes them more solid, to prevent the seed being deposited too deep. You may get quite as good a crop by sowing and cultivating on the level, but they are much easier to work in raised drills, and the horse-hoe can be used sooner without injury to the plants. The drill we have used for sowing is one of the kind used in Yorkshire, England, a cumbersome machine, drawn by two horses (sows three drills at a time), and has an arrangement for sowing dry manure with the seed, which can be used or not at pleasure. We have sowed a mixture of coal dust, ashes, bone-dust and dry swamp muck with very satisfactory results. It is certainly a good principle to sow manure with the seed, but it is rather troublesome. We have never tried superphosphate, but have no doubt it is a good thing.

For covering the seed I think a brush is the best thing; it may be made of green branches or boughs drawn through a light frame of poles; a roller packs the ground, and when a shower of rain comes it is apt to form a crust on the surface, which prevents the plants from coming up. I think it better to sow after a shower if possible, while the ground is damp and the crust does not form on the surface as it would if they were sown before a shower, besides the ground is better for being a little solid, as the seed does not need to be so deep. The best time to sow is about the 20th of June; any time between the 15th and 25th will do very well, but if the weather, or other things, are unfavourable to sowing at that time, I would not be in a hurry. I have seen a good crop of turnips that were sown on the 12th of July. We usually sow about 2 pounds of seed per acre; some persons sow 2½ or 3 pounds. Of course a much less quantity would be sufficient if it all grew, but it may not all germinate, or the fly may come in for a share, and it is well to have enough, as the additional expense is only trifling, besides you have a better choice of plants in the operation of hoeing and thinning.

As soon as the plants are large enough, they must be thinned by striking the hoe across, the drill, cutting out the width of the hoe, and leaving only one plant in a place. After a little practice it will never be necessary to use the hand in separating the plants, and a good hand can hoe three-quarters of an acre a day. The hoes should be from 7 to 9 inches wide and straight in the head, so as to be used in pushing from you as well as pulling towards you.

Persons acquainted with turnip culture are very apt to fall into the error of leaving the plants too thick, but experience teaches us that under no circumstances should they be less than 9 inches apart, and I think that 12 inches is decidedly preferable. It will be seen in harvesting that where they are thin they are much larger, and there is less expense in harvesting large turnips than small ones. In the operation of thinning there is room for the exercise of some good judgment; care should be taken to select the largest and healthiest looking plants, and in order to do this it is better to cut out several small ones even if it makes a much wider blank than usual. The soil should be well moved around every plant so that it will fall over; they will bear a good deal of rough usage, and be better for it. The crop will pay for being twice hand hoed. The horse-hoe should be freely used from the time the plants are large enough for hoeing till they are too large to admit of its passing between the drills. I am so well satisfied of the benefit of horse-hoeing that I believe it would pay to run that implement through them once a week.

The quickest and easiest mode of harvesting that I know of is to cut the tops off with hoes; the hoes should be ground pretty sharp; then plough them out, taking the mould board off an iron plough for the purpose, the ploughshare cuts off most of the roots, and pushes the turnips out of the ground.

For storing, nothing is better than a cellar. A cellar under a driving house or barn, with trap doors in the floor, is very convenient, and here we use an arrangement to prevent the earth from going into the cellar with the turnips. It is a sort of grate or riddle made of two pieces of scantling or plank ten feet long

and two feet wide, with bars of iron put in crosswise about 2 inches apart, and two legs bolted on to one end to elevate it to a slanting position. The turnips are thrown on to this and roll into the cellar, while the earth falls through upon the floor. It is very important to keep the earth from going into the cellar, as it prevents the circulation of air among them, and causes them to heat and rot. Whenever the weather is mild all the doors and windows should be left open, as there is more danger from heating than from freezing where they are stored in such large masses. If they should heat, it can be detected by the smell, and in that case they must be picked over, and the injured ones removed. If the floors of cellars and root houses could be constructed of scantling or narrow planks placed a couple of inches apart, so that a current of air could pass under and up through them, it would be a great improvement.

Where sufficient room in cellars cannot be provided, they may be kept tolerably safe in pits. Dig a trench 4 feet wide, and 8 or 10 inches deep; fill in and shape up to a point; cover with straw 8 inches deep, and then about seven inches of earth, leaving the top open 6 inches wide, and cover with wide boards, to throw off the rain. They should be taken out of the pits early in spring, and put in the barn.

For young animals turnips must be sliced, but cattle and sheep from two years old upwards will eat them very well without being cut, and are not any more liable to get choked. Young sheep, or sheep that are being fattened, may with safety be fed all the turnips they can eat, but it is not good to give a very large supply to breeding ewes. Cows will eat a bushel and a half a day, but a man must have plenty to feed at that rate. Hogs will winter very well on turnips.

The above remarks apply only to Swedish turnips.

Progress of Flax Cultivation.

The subjoined report of the progress and increasing popularity of flax, as an object of culture among our farmers, has been received by the Board of Agriculture of Upper Canada, from that energetic promoter of flax cultivation, Mr. J. A. Donaldson, and has been handed to us for publication, by the Secretary of the Board.

To the President of the BOARD OF AGRICULTURE:

SIR, As I have been engaged by the Board to give instructions in the cultivation of the flax plant, I deem it my duty to furnish you with a brief statement of the progress that is being made, and have now the honour to state that since the first of January, I have been unceasing in my endeavours to bring this important subject prominently before the agriculturists of Western Canada. In doing so, I have attended several meetings in different sections of the country, and found on all occasions a strong desire, on the part of the farmers, to give this new crop a fair trial this season.

In the county of Peel, three meetings were held during the month of April, one at Streetsville, one at Brampton, and a third at Meadowvale. On all three occasions the Messrs. Gooderham & Worts attended, offering the most liberal inducements to the farmers to commence its cultivation in that section of country. They not only offered to provide them with seed for sowing, and wait for pay for it till after harvest, but stated "they would be prepared to buy the crop in the autumn, offering the handsome sum of \$15 per ton for all they could procure, and this price for the straw with the seed on, making it conditional at the same time that the farmers could have this price after the flax had been cut either with the cradle or reaping machine, or \$14 per ton if pulled by hand in the usual way." This ought to be a great inducement, when we are aware that an average crop of flax, in ordinary seasons, will produce in this state, from 2½ to 3 tons per acre, allowing the farmer to realize from \$35 to \$40 per acre for the crop. Many parties accepted this liberal offer, and put their names down for seed enough to sow from five to ten acres each. Mr. William Gooderham, of Meadowvale, assured the parties at the meeting, that he would sow at least thirty acres himself, as an example to others.

Mr. William Perine, of Conestoga, Co. of Waterloo, attended these meetings also, and stated that from 11 years' experience in the county of Waterloo, he had