

expense could be readily met by a small tax per square mile of timber limits under lease, or per thousand feet of lumber sawn, or cubic feet of square timber produced, the saving annually of timber trees from forest fires would alone pay the cost of the department for many years.

MONTREAL, Oct., 1885.

At different times we have called the attention of our readers to the great importance of Mangels for winter feed, and have described fully the method of management. Mangels give a large yield of roots for cellar storage, and also a good supply of tops suitable for conversion into ensilage. They can be kept perfectly sound and plump over winter and summer, from one fall till the crop of the following year is ready. In the present month's number of the *Journal of Agriculture*, published for the department of agriculture for the Province of Quebec, we find an exhaustive article on Mangel Culture, containing excellent advice,—from which we extract the following:—

*Preparation of the land.*—The deeper the cultivation, the greater the crop, is an axiom in mangel growing, as well as in growing all kinds of roots. By this, I do not mean that in heavy land a large mass of raw clay should be turned up in spring, involving all sorts of botheration in cross-ploughing, grubbing, harrowing, and rolling, until half the summer is over. This would defer the sowing of the crop till all chance of an abundant yield was over. Still, the great aim of the root-grower should be the attainment by degree of a good depth of well worked soil, and he never should be satisfied until he has secured a furrow of a least nine inches deep.

The treatment of heavy land, as it is usually met with here, should be carried on in some such way as this:—

The last crop has, of course, been grain of some sort—the concluding one of the rotation—and, therefore, if there is any couch-grass, or other root-weed, in the land, it must be got rid of. This is, in my part of England, the very strongest feature in our system of farming. The moment the grain-crop is carried—sometimes, even, as soon as the shocks are set up—the cultivator is worked up and down the ridges and across them; the harrow and roller pulverize the broken surface, and the horse-rake drags the grass, etc., into rows. The rubbish is then either burned or, preferably, carted way to the corner of the field, to form the foundation of a mixen for the coming root-crop. With our best farmers, the cultivation is so perfect that this part of the preparation is rarely required, for the very commendable practice of ferking out

couch grass in the stubbles directly after harvest is fast increasing. The cost is trifling, and the cure is perfect. A little knot of couch-grass, if pounced upon as soon as the crop is off, is easily removed from the soil by a fork; but if it be raised by a grubber, and torn to pieces by the harrow, it may be carried over half an acre, and will become difficult to collect. Still, in this province, where skilled farm-labour is so scarce and so dear, the grubber will be found the cheaper if not the more accurately effective implement; the sun is often very scorching in its effects during August and September, and I have often observed that grass and other root-weeds have been so completely desiccated by a couple of days exposure to the air during those months, that all fear of their growing again was at an end.

The root-weeds having thus been all got rid of, the next operation is the winter furrow. When land has been fairly treated, and is not an absolute stranger to the dung cart, the depth of this ploughing may be given just as deep as your horses can draw the plough. I should not like, as a rule, to bring up more than one or, at most, two inches of raw soil from the bottom of the old furrow; but we must not forget the enormous pulverizing effect of our Canadian frost on a well laid furrow slice, and the descent of some portion of the former manurings into the subsoil will have tempered its acerbity so as to render it less hostile to the interpenetration of the filamentous roots of the future root-crop, particularly in connection with heavy dressing, which *must* be given if you expect a remunerative crop of mangels. In truth, if I was to lay down so dangerous a thing as a law for ploughing, it would be: always plough deep for roots before winter, but never go below the old furrow for grain or pulse.

On *very* heavy land, not subject to spring flooding, I am inclined to think that the easiest plan for growing mangels is to plough down the dung in the autumn, and to sow the seed in the spring on the flat surface of the stale furrow. I have tried this, and found it answer well. It simplifies matters extremely, and does away with half the work at the busiest season of the year. The only objection I see to its practice is the difficulty of finding enough manure at the time of preparation. This might be avoided in the neighbourhood of towns or large villages, but in a "far-removed place" I do not see any way of getting over it except by keeping the manure of the previous winter in a flattened heap, covered over with fifteen or twenty inches of earth.

I saw many years ago, at Batleigh, in Somersetshire, England, a very wonder-

ful crop of mangels grown on the sternest, stiffest yellow clay on the lias formation. As far as I recollect, the process carried out by Mr. Gray, the steward of the Hon. and Rev. Neville Grenville, was as follows: the land was cleaned in September, and ploughed ten inches deep immediately afterwards; grubbing and harrowing then reduced the land to a state which admitted of its being set up in drills by the plough at twenty-seven inches apart; twenty tons of dung were spread to the acre, and covered by splitting the drills as usual, and the land lay in this state till the following spring. As there was an open furrow between each drill and its neighbour, no water could well lodge on the piece, and so when the next season opened, the soil was found thoroughly dry and well pulverized. In April, a good many seed-weeds, such as *cauluck* (wild mustard), chickweed, and other annuals, had sprouted; these were destroyed by the harrows with one *tine* along the drills, which were set up again in good shape with the double-mould-board plough, care being taken in performing this operation not to touch the land till it was thoroughly dry, and not to put any of the rawer soil on top of the drills. All was now ready for planting, which was done in a peculiar fashion invented by Mr. Gray himself: a light roller was passed along the drills to flatten them a little; a man with a largish dibble made holes every foot down to the dung, into which a boy poured about half a pint of mixed manure, and a girl, following last of all, covered the manure with a handful of earth, dropped three or four seeds on the spot, and covered them with about half-an-inch of mould. The roller completed the job. The mixed manure was composed of superphosphate, guano, and fine gardenearth; but with our better knowledge nowadays we should leave out the superphosphate. The crop over the twenty acres thus treated was thirty-seven tons to the acre of sound roots, with about six tons of tops, which were ploughed in then, but now would be put into a silo.

Mr. Drummond, of Petite Cote, Montreal, dibbles in all his mangel seed, but without the extra manure in the holes. I need not say he grows good crops, but in my opinion he sows too many seeds in a hole, as the last time I saw his crop the plants, which were about fit to hoe, looked crowded and twisted together, and the boys in singling them must have been very careful if they did not leave gaps. Each grain of fresh mangel seed contains at least two and sometimes four germs; hence, three or four grains in a hole would be sufficient. For my part, I prefer, I must confess, a continuous row to a crop of fixed intervals.