either for home use or market. They will also increase the value of the property and help to make "no place like home."

The results that we have had in growing trees at the Central Experimental Farm may be found in the annual reports of the farms.

W. T. MACOUN, Horticulturist.
Central Exp. Farm, Ottawa.

Root Growing — Thirty Years' Experience.

BY CHAS. C. FORD, ELGIN CO., ONT.

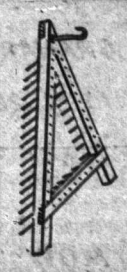
We have grown turnips for the last 30 years, and must say we have had excellent success. We have found a gravelly or sandy loam the best and most productive soil for turnips; as on clay loam or black sand they are almost sure to grow too much top and neck, and the root is invariably small and of poor quality. We have had excellent crops of turnips on very light sand. As for mangels and carrots the heavy soil is by far the most productive, but carrots can be grown successfully on medium soil as well; clay loam is by far the easiest tilled and cleaned, but carrots may be found more difficult to harvest on clay, as the earth is generally hard and dry at that period, and if wet, the soil adheres to the roots. Mangels also do best on heavy soil. We have tried them on all kinds of soil, but the heavy soil is by far the best, and I consider it the most easily and thoroughly cleaned and kept clean, and that is the secret of success, combined with the right soil, in root-growing.

We generally fall plow our root ground, and apply manure in the spring at the rate of 25 to 30 tons per acre; we spread it evenly, and see we have as well-rotted manure as is available, and work it under—not too deeply—with gang plow or disk harrow. For turnips we work our ground every week until sown.

We sow our carrots and mangels about the first of May in drills 30 inches apart so as to enable us to cultivate with a horse. We use a Planet Jr. drill, and sow carrots at the rate of 1 to 2 lbs. per acre; mangels, 10 lbs.; and turnips, 2 to 3 lbs. By sowing immediately after rain or a day or two before we have had usually quick and even germination of seed. We do not approve of soaking the seed unless it is an unusually dry season. The Improved Short White horse carrot is the only carrot worth sowing; all other varieties fade to insignificance beside them. Mangels—The Mammoth Long Red and Yellow Globe are both good croppers and keepers. We usually sow the sugar beet; they are much better keepers and richer to feed. Turnips—Mammoth Purple-top swede and Skirving's Purple-top are the best croppers, keepers and feeders in the turnip kingdom, and also in the root-feeding localities.

milch cows, with no bad flavor in the milk. I also think highly of Simmers' Improved Champion Purple-top turnip; it is mild in flavor, smooth and firm, and comes out in spring as fresh as when put up in the fall. At one time I liked a good many others, but of late years I am after quality first, and endeavor by manure and plenty of cultivation to get the size. I always sow salt, one sack to acre, on root land, as I am positive it is obnoxious to grubs, etc., that prey on root plants. It benefits the soil besides.

As to the feeding value of roots, and what each is best adapted for, I would rather have mangels for milch cows; carrots for horses and swine; turnips for beef and young growing cattle, and also for sheep. I am making a test of raw versus boiled roots for swine. I have made the test on carrots alone, and as far as present results show would never boil or cook carrots for swine. I have made the cheapest pork I ever made this winter on raw Danvers carrots, with an addition of milk, a little mixed meal and corn on cob to wind up the day's feeding.



The side pieces of cultivator are 3 feet long, 2½ inches wide, 2 inches thick. The crosspiece can be made to widen or be made stationary. Every 2 inches apart holes are bored with a heavy slant backwards, and 6-inch wire spikes driven in. The slope to teeth will keep it from clogging. The draft wants to be raised about 7 or 8 inches; a pair of handles are bolted on, and with a steady horse you have the best tool on earth for the first cultivation of the root crop.

Root Crops and their Feeding Values.

BY W. A. HALE, SHERBROOKE CO., P. Q.

In regard to the feeding values of the various root crops, I would say, first, that an average result of analyses by many of the most reliable scientists, of the feeding values of the different root crops by weight is as follows: Taking good meadow hay at 10, it would take of carrots 28, of mangels 47, of swede turnips 52. For horses, carrots seem especially suited, not alone for their feeding value, but as correctives as well, especially in winter. I have fed mangels to working horses (half a bushel a day), and though they were fat and sleek and worked well, they perspired so freely that for our climate and ordinary care I felt it was not safe. For fattening cattle and milch cows where the feeding is properly done—just after milking, for turnips—and the mangers cleaned out, I consider turnips of more value than mangels, but it is often more a question of which our soil is best suited for, and as to which yields the largest crops. Scotland outdoes England in turnips, yet cannot grow mangels successfully, while in Ireland on the drained bogs the long red mangel produces enormous crops.

Carrots, either white or red, give rich yellow butter in winter, with unsurpassed flavor, and where soil suits and their cultivation is understood, I prefer carrots to either turnips (swedes) or mangels. Owing, it is supposed, to the large quantity of common salt contained in turnips and mangels, the latter when fed *largely* to milch cows have the effect of *reducing* the flow of milk; and the former of causing abortion in ewes if fed freely towards lambing time, or if not abortion the lambs are apt to be small and feeble. I once had a flock of ewes in grand order on turnips, that lost 70 per cent. of their lambs by abortion, and supposing they needed more turnips, I added to their troubles by increasing their roots and their peculiar weakness at the same time.

Carrots contain 80 per cent. of water, mangels 85, and swede turnips 89, but as that practical authority, Jenner-Fust, jokingly says, "the water in turnips is not like other water." He refers to the beneficial effects of feeding roots with dry feed as an assistant to digestion and assimilation, and a corrective quite as much as a nutrient. Who has not seen fowls when fed dry grain wander off even in the dusk to eat a proper equivalent of grass? And yet they could have eaten the grass alone had they so desired. There is but scant nourishment in mineral water, yet in many cases men grow fat and strong from drinking a glass of it every morning. It acts as a corrective, and so in a way with roots.

For growing roots, first I prefer to plow down clover sod in August, using a skim coulter, and if the furrow slices show openings where the skim coulter cuts, then press down with roller, or disk harrow with disks running straight, or harrow lightly. Next to this I would take stubble land in ordinary rotation. In spring, disk harrow, spread manure if for level culture, plow, disk harrow, cross harrow with common iron harrow, roll, sow with Planet Jr. hand seed drill.

If for drills, open with double moldboard plow 30 inches apart, run Planet Jr. cultivator with three teeth in bottom of drills, spread manure from carts, cover with double moldboard plow, run same cultivator in open furrow; roll drills lengthwise for carrots, sow double row on top of each drill nine inches apart. I would not suggest sowing cabbage seed with the roots: they would shade too many carrots. The mangel ground probably would not suit them for sure heading. If with late swedes they would not mature, and even if early, they would not yield so sure a crop as swedes, and would be far more difficult to store in winter.

Will Corn Displace Roots?

BY ELMER LICK, ONTARIO CO., ONT.

In considering the question of root-growing, I am of the opinion that in nearly all sections of Ontario it will soon be accepted as the best practice to almost discard roots and rely upon the corn crop to supply succulent food for winter months. This crop must certainly be stored in the silo, then you have a cheaper and more nutritious food than can be secured grown with either mangels, carrots or turnips. Our practice has been to drop mangels entirely. We like a few carrots for horses, also turnips for young stock, as they contain more bone material. We now grow about two acres turnips and twenty of corn, about twelve of the last named for silo.

For our turnips we plow sod, usually clover, either in fall or early spring. Spring-tooth thoroughly as early as convenient; if the plowing was only about four inches deep the sod can be torn to pieces, then apply twenty loads per acre manure, plow quite deeply and work with harrows or cultivator, according as required to keep down all weeds and grass until time to sow. Sometimes we plow again before ridging, sometimes it seems useless to do so. We ridge with common plow about thirty inches wide, and sow with turnip drill from one pound up to two pounds per acre; the lesser quantity if land is moist and fine, and more if rough, cloddy and dry. Nearly always we follow with the field roller, so that the drills will be more compact and flatter. We like to sow about June 20th. If the seed can have a nice moist soil to lie in, and gets a shower of rain, there is no trouble about its germinating. The best we can do is to keep the soil thoroughly cultivated, and so retain the moisture. We are growing Elephant or Monarch altogether now. But I can't help adding that the best turnip is a thrifty corn plant with a nice ear of nearly ripe corn on it placed in a good silo. There is less work about it and more pay.

JAS. B. GOVENLOCK'S $1,000 BARN.

Flat Cultivation for Roots.

BY JAMES ESDON, GLENGARRY CO., ONT.

I am not particular in selection of a field for the root crop. Most people seem to prefer a stubble, but the best crops of roots I grow are on a pasture sod plowed in latter part of August and well disked and harrowed before fall sets in, top dressed in following winter with twenty-five loads of manure per acre; this is slightly plowed in, and sometimes, if in a hurry, we disk it over instead of plowing it. I used to spend considerable time making a very fine tilth or seed-bed, but do not spend so much time now on preparation of seed-bed, rather preferring to spend the extra time on the plants after they are up. We mark our rows two and a half feet apart with a two-horse marker, and sow with a one-horse Queen planter and sower. This is a heavy machine, quite a roller on it, leaving a well-defined mark; so should we have a long cold spell after sowing, like last spring, the weeds are sure to get a start, so we just hitch up a horse to little V-shaped harrow. (See illustration.) Here is where the seed roller marks come in. We can work to within two inches of the seed row, and destroy every weed in sight. Sometimes I put in two shorter spikes in each wing of harrow, and this will scratch lightly over the seed, breaking the crust, allowing the coming plants to get air and warmth. Cultivate from one and a half to two inches the first couple of times, then gradually increase the depth, which has the tendency to raise the drill somewhat, which I consider needful on level cultivation. There is no limit to the number of times we cultivate; would cultivate twice every week for the first two months if we had time to do so, and no work would pay better. We leave three inches between carrots, eight to ten inches between turnips, and about the same distance for mangels, although I have often left Tankard mangels closer, and they would shoulder out from each other, and grow quite a size, as they have small tops.

After a test of a great many varieties, I have selected, in carrots, Danvers Half-long, a good keeper, very juicy and sweet. I also sow one-half acre of the White Vosges for fall feeding, as they are at their best then. This year I shall sow only Golden Tankard and Intermediate Yellow mangels; they are the two most satisfactory mangles I have found so far. In turnips I sow the Great Mogul swede, an English turnip, very juicy, a firm, good keeper, and lacking in the rank flavor so many kinds have. Can feed them quite liberally to

Growing Corn.

BY JAMES B. MUIR, BRUCE CO., ONT.

Clover sod plowed under after the first crop has been cut makes one of the very best crops to follow with corn. We plow in the fall, top dress with manure either during winter or just previous to planting and work in the surface thoroughly until there is a fine seed-bed about three inches deep and plant the corn in this. I consider clover is one of the very best fertilizers at the farmer's disposal, and I am sowing clover seed with all my white-strawed crops.

Compton's Early, Leaming, and Mammoth Cuban are the varieties generally grown for ensilage, and Stowell's Evergreen for fodder in autumn. We usually plant in drills, shutting off the seed from four spouts, which leaves the drills twenty-eight inches apart, which does very well for the smaller varieties of corn. We usually count on sowing half a bushel of corn per acre.

We harrow the corn land two or three times after planting: once just as the corn begins to come through, then if the land does not smother up the corn too much, or the harrow tear too much of it out, once or twice after it is up. But we begin to use the scuffler very soon after the rows are well defined, at first pretty deep, say two and one-half to three inches, and pretty close up to the drill, then shallower each time, never cutting more than enough to just make a nice mulch on the surface after the roots once spread out between the drills. We keep the scuffler going whenever it is required; always after rains, and if the surface begins to crack, which shows that evaporation is going on.

Growing Corn to Husk.

BY THOS. P. HART, OXFORD CO., ONT.

As corn is a hoe crop and tends to clean the ground, it is considered advisable to choose the field having the most thistles and weeds, generally after a couple of crops of oats. This plan may not give the largest yield, but helps to keep the farm clean. If the corn follows oats, the land is plowed in the fall and manure drawn out in the winter or early spring, if convenient, and deposited in large heaps on knolls or poor spots, to be further distributed and spread over the land as soon as the spring seeding is done. About twenty loads per acre is considered a good coat. Harrowing the field at odd times during seeding will keep the grass and weeds in check, and also level the land, making it easier to plow. Immediately after the manure is spread the land is plowed just deep