

except in gardens, soils sufficiently rich to insure a large crop of roots unless manured in the drill, and I believe the reason is that our seasons are too short to allow the roots to grow to their full extent where they do not find the manures they require sufficiently close at hand.

Commencing with the *potato*, as being the most important root crop of all, I find that the ideal soil for it is a deep, sandy loam, with a well drained or gravelly subsoil. I should avoid grass sod land unless I felt sure that there was no likelihood of its being infested with wire-worms, and if the sod were not sufficiently rotten to allow of easy cultivation by horse power, I should seek a place elsewhere, such as a wheat, barley or oat stubble, or, best of all in my experience, a clover sod turned under deeply in August, and on the bare furrow before winter sets in, spread with a manure spreader the summer's accumulation of cow dung, at the rate of at least ten tons to the acre, for, if only from pasture-fed cattle, it will not be particularly rich stuff. During the winter, or early spring, the manure from the cow stables should be drawn out and piled on the head lands at each end of the field, and if dry swamp muck has been used in the stables as an absorbent, the manure should be just what is wanted for this crop. Mixing one load of horse dung to four of cow, will insure sufficient heat to decompose it, and if turned over once after being drawn out, it may be still further improved. As early in the spring as possible cross plow and harrow in 20 bushels of hard wood ashes to the acre, then, with a double mould board plow (or an ordinary one will answer, though not quite so well), strike out deep drills from 27 to 30 inches apart, and if the sun is bright do not open more drills than can be attended to promptly; then, if the soil is of a loamy nature, run the drill grubber with only three teeth in, and set narrow deeply in the bottom of each drill to loosen the subsoil. Should the land be of a stiffer nature, use a subsoil plow instead. Spread from one-horse carts 15 tons to the acre of the manure above mentioned evenly in the drills. As to the seed, between cutting the seed to two eyes and planting small, sound, whole potatoes, I have not much choice; fifteen bushels of either to the acre should be sufficient, but when the seed is cut, land plaster should be shaken over the sets to stop the bleeding, and the sooner they are in the ground the better. Change the seed from a different soil and locality every year, if possible, and also change the varieties just as soon as they show the least sign of running out. In planting the seed, either by hand or with a horse potato planter, drop the sets from 10 to 12 inches apart upon the dung and cover as soon as possible with the plow; roll heavily once, and in ten days from planting run the subsoil plow deeply in the open furrow between the drills; this will nearly fill them, will take the place of the first cultivating, and will do away with objections of the drills being too dry. When the plants are up from one to three inches, harrow once or twice along the drills with a Thomas smoothing harrow, or a light, straight-toothed one, if no better is to be had; it will do no harm. Keep the weeds down and the soil mellow between the drills with the horse-hoe teeth, or the drill grubber, run very shallow till a moderate earthing up is given, only to insure the potatoes not being sun-burnt; after this, pulling any large weeds that may appear by hand should be sufficient. Keep

down the potato beetle with Paris green, as soon as the young are hatched out, using one tablespoonful to 3 gallons of water, applied with a whisk and constantly stirred with the same, lessening the amount of the poison as the sediment accumulates in the pail. Plow out the crop after the haulms have been gathered, using a Scotch plow, and taking at first every alternate drill; when finished, harrow up and across, and few will be left. When storing, either in pits, root-house or cellar, a slight dusting of air-slaked lime will be a wise precaution against rot.

Taking *Suede turnips* next, I would advise the clover sod, if well plowed down in August, but should reserve all the manure for applying in spring, having it well rotted, and not allowing any cow dung from the turnip-fed cattle to be used here; and, as clayey loams contain a large amount of potash, I would not apply ashes for the turnip crop, unless upon sandy loams or peaty soils, and then 25 bushels to the acre spread as early in spring as possible. As to Canadian superphosphates, I have either never had any that were what they ought to be, or else my soils do not require them, for I have never found the use of them anything but a losing investment. Well rotted horse manure, the piles having been turned once after being drawn out, or a mixture of ordinary farmyard dung well fermented and applied at the rate of 30 tons to the acre on land prepared as for potatoes, will give a heavy yield; for remember that it is the *last loads of manure that bring the profits*. Form drills 27 inches apart, and when each one is half covered, apply over the manure fine bone dust at the rate of 400 lbs. to the acre, and then finish the covering. This gives the young plants a vigorous start from the first, and benefits them throughout. Three lbs. of seed per acre, sown  $\frac{1}{2}$  of an inch deep either by a single hand drill or when the drills have been evenly made by a 2-row horse machine, some of which sow the bone dust at the same time, followed by a heavy rolling. Then, as soon as the plants appear above ground, if the fly threatens destruction, sow land plaster on the leaves while wet with dew. Run the subsoil plow between the drills deeply, and follow it in a week with the scuffling horse hoe, the bent teeth of which should pare away the earth close to the rows of turnips and cultivate the soil between at the same time. Before the plants are large enough to entangle one another, single out to 10 inches apart, using a square cornered hoe, 7 inches wide, set at right angles to a short handle, and working out the plants by a pushing motion, instead of cutting in the ordinary way. When this art has been acquired one of the main difficulties in the way of profitable root culture has been overcome. Keep the scuffling horse-hoe or drill grubber lightly at work pulverizing till the leaves almost meet across the rows, and hoe out between the roots any weeds that may appear. In "topping and tailing," an old scythe blade cut to suit and set in a wooden handle, can be made to do for either a right or left hand worker, or a common shingler's hatchet works admirably. On pulling the turnip, sever the root with a single blow, and reversing the root by tossing it in the air, treat the top in the same way.

Coming next to *mangel wurzel*, I should still advise the clover sod, as for potatoes, and prepare the land as for the same, but would spread the ashes, bone-dust or superphosphate broadcast while the drills are still open, the plow bringing it nearly all where it will soon be reached by the young plants. I would prefer the long red variety on rich loam or peaty soil, but for general purpose on ordinary land I have found the Yellow Globe the most satisfactory. Single to 12 inches apart, and, in harvesting, simply twist the tops off, and by throwing the roots to where they are to be piled, enough soil will be shaken off to insure their keeping in the pits.

For field *carrots* select a deep, sandy loam, and following a grain stubble, harrow as soon as harvest is over to start the weeds, and run drills in the fall 33 inches apart, using the subsoil plow in the drills the same as for turnips. Spread 25 tons to the acre of what manure can be procured at this season, and cover deeply. In the

spring harrow along the drills, and, if necessary, replace some of the earth with the plow, roll heavily and sow the seed (having soaked it) in double rows on top of each drill 6 inches apart. Run the subsoiler between the drills, and thin the plants to 4 inches apart, using a 3-inch hoe. In this way the rows average 16 $\frac{1}{2}$  inches apart, and the yield I have found to far exceed single rows on narrower drills, and one hoeing almost does two rows at once. In harvesting, as you pull each carrot, cut it from the top at once with a sharp knife, allowing it to remain on the ground to dry. Gather in small heaps before night and cover from frost, taking the covering off each day for a few days before storing to allow the moisture from the sweating to pass off.

*Parsnips*, though not much grown in this country for stock, are excellent for producing milk and well flavored butter, and should be cultivated as carrots.

Yellow and white turnips are not much grown in Canada for feeding purposes. Cultivate as for swedes, thinning to 8 and 10 inches.

To those who might think that the above suggestions on growing roots—if carried out—would entail too much labor to be profitable, I would say that I have not found it so, and that what is worth doing at all is worth doing well, and that if these operations are attended to in time, and particularly before the weeds get a start, the work entailed will not be so heavy as one would suppose who has not tried any but the haphazard and trust-to-luck methods too often in use.

#### An Unfair Accusation and Untrue.

Editor Farmer's Advocate:

SIR,—In your April issue is an article headed "Our Government and its Confederates Preach False Doctrines in the Methods of Restoring Fertility of the Soil," and signed by "Subscriber." I believe, sir, you will have the fairness to allow me to reply, as I am distinctly designated.

It is unjust and untrue for "Subscriber" to charge me with being a "confederate" of the Government. It is true that I read a paper on "Robbing the Land" at the Dairy Convention of the County of Huntingdon, P. Q., on Feb. 7th, 1887, going down there all the way expressly for that purpose; but I did so solely on the invitation of the Secretary of the Association. It is therefore unfair and untrue to charge me with being a confederate of the Government, although if it were so I would not be ashamed of the connection.

I am next charged with "preaching false doctrines in the methods of restoring the fertility of the soil." I did say that the fertility of land could be maintained while selling off from it beef only or dairy products, without any additional enrichment other than it will itself provide, if judiciously managed, and so I still believe. I did say that in this way I had doubled the producing power of my own farm in eight years, and can furnish the evidence if necessary. I did not say that the fertility of "exhausted" farms can be restored in this way, but I believe it can, only it will require a longer time. I am willing to argue this point, Mr. Editor, with "Subscriber," or yourself, or any other living man, in the columns of your paper, or on any platform that may be named within a reasonable distance.

I did say, as "Subscriber" represents, that the day for the use of artificial manures is coming, and that it was unwise to buy these while we were allowing our present sources of enrichment to waste, and I have met with nothing since that in any way alters this opinion. All men will not grow beef or dairy products, and when those who do not have first husbanded their home resources of manurial enrichment, it is far better that they should buy artificial manures to supply the lack caused by the selling of the grain.

I did not say that "ashes are better (intrinsically) than phosphates or guano," as "Subscriber" states. I said that ashes allowed to waste on the farm would give a better return for their timely application than *purchased* phosphates or guano. And so I say now.

THOS. SHAW, Hamilton, Ont.

[Our correspondent "Subscriber" did not call you a "confederate" of the Government; no