

On light land, like the much abused Sorol sand, where swedes yield  $\frac{1}{2}$  more than mangels, we should grow  $2\frac{1}{2}$  acres of swedes and 1 acre of mangels.

We shall never probably attain to the enormous crops, of mangels grown in the West of England, of which we gave instances a month ago. Ninety-six gross tons to the imperial acre seems an impossibility, for in this case the roots must have averaged 9 lbs. apiece at least. We shall have more to say on the yield and value of root-crops at the conclusion of this series.

### THE ROOT CROP.

EDS. COUNTRY GENTLEMAN.—As it now becomes spring again many farmers should learn the importance of a good root crop and raise it. There is nothing much more valuable in connection with hay and ensilage for feeding than a good crop of turnips or mangel wurzels and it has been demonstrated that they can be grown for the low price of about six cents per bushel. Besides, the leaves of these crops in the fall for feeding when sowed corn is gone and it is not desired to turn stock into meadows, are very valuable. (1) Some of the secrets of growing these crops or things which have heretofore stood in the way of growing them, I will mention, so that all farmers who desire may have the advantages of the blessing conferred by these crops.

One of the first things and most injurious in the way of raising these crops is the trouble from weeds. This can be remedied, usually, best in the fall before; plow your land early, or if it has been planted the year before a good cultivating perhaps will do; harrow it down finely; this gives a fine seed-bed and in a short time all the weed seeds will start to grow. Then, harrow again and kill them all, and by the time they start a second time, and get a good harrowing and are exposed during the winter, there will not be many of them left. (2)

Good manure of course is a necessity for growing a good root crop. If barnyard dung is used and is coarse, I should row it under, but if it was well rotted it should probably be best to cultivate it in on top. But it sometimes occurs that farmers have not sufficient barnyard dung. When this is the case what to rely on is superphosphate, and this should be put on in the drills at from 800 to 1,000 pounds to the acre. (3) The roots should be sowed in drills at  $2\frac{1}{2}$  feet apart. (4) A very important thing about sowing, and one about which a good many make a mistake is this. In seasons when the ground is dry they go on and work it, and in this way it becomes dried out. A streak of this dry ground will become covered over with this moist soil, the seeds are then sown, they germinate, their roots come in contact with this dry earth, it does not rain, and they refuse to grow. Now if the farmer, after working his soil had waited two weeks or so, this dry ground by capillary attraction would become damp from the moisture underneath. Then if he had sowed his fine seed upon this moist seed-bed he would have had a good crop.

After the seed is sown, most of the work can be done by cultivator, except for men passing through the rows and cutting out the distances between the

plants to about 15 inches, (1) and finally weeding. If well cultivated, and the soil good, the crop might reasonably be expected to produce from 800 to 1,000 bushels to the acre, which is easily harvested. The common ruta-baga, or swede, is the best for winter use and should be sown earliest. The white or yellow turnips are sown next, but used first, as the former is the better keeper.

There are several varieties of mangel wurzels—long, red and yellow, and the red and yellow globes. I consider the globes the best, as they are the hardiest, and also more nutritious. The mangels should be sown early—as soon as the ground is in proper condition. About two pounds (2) of ruta-baga seed will answer per acre, and about four pounds of mangolds. J. F. Worcester, N. Y., Feb. 16.

In the last issue of the Experiment Station Record, M. A. Hébert of the French Experiment Station at Grignon, France, publishes a brief summary of the results of the most reliable French investigations on the production, care and use of farm manure. It may be called a special plea for barn manure as against the use of green manuring or chemicals. The chief proposition is that nothings should be used for direct manuring that can be fed to animals. (3) In other words, the feeding value should always be considered. The chemical changes that take place in the manure pile are explained at considerable length. Speaking of absorbents, it is stated that fine peat has twice the absorptive power of wheat straw and is the best substance for retaining moisture. The use of plaster, kainit and similar substances is not commonly recommended by European scientists. The favorite plan seems rather to be that of using large quantities of litter and taking pains to keep the piles sheltered and well packed down. These piles are usually built over a cistern in which the drainings from the pile are held, to be pumped to the top of the pile from time to time. In regard to the fermentations that take place in the manure piles, it is claimed that these are simply a "continued digestion" really "a prolongation of the digestive functions." That is to say, the microbes which induce the needed gas fermentations in manure are derived from the intestines of the animals. In the intestines of recently slaughtered animals are found ferments presenting the same character as those of manure, and also the same mixtures of gas. Thus the manure fermenting is about the same thing as a continuation of the digestion in the stomach. The object of this is to show that manure from animals is more valuable than an equal amount of vegetable matter not fed. It would be interesting to compare with this the value of the "artificial digestion" in compost heaps of straw, muck, potash, and bone or blood. Is it really true that vegetable matter acquires certain manurial properties by "passing through an animal?" (4)

### DIFFERENT VARIETIES OF RED CLOVER.

BY W. A. HALE SHERBROOKE, Q.

As clover growing is rapidly increasing in popularity year by year, two points of great interest present themselves to us; first, what varieties are best suited to our soils, climate and requirements, and second where can we be sure of procuring clean, fresh, unmixed seed free from other varieties.

Of alaike and white Dutch clover, their uses for hay and pasture are so well known and their seeds usually so little mixed that they need not now be considered. Of sainfoin, lucerne or alfalfa, as substitutes for clover, not being suited to the soils nor climate of Canada, I believe we need never trouble ourselves, especially as such good results can be obtained from red clover; crimson clover also, though no doubt very valuable in more southern latitudes, is of no use to us. Red clover therefore seems to be the staple variety upon which we must principally depend, and its importance in nearly every class of farming, gardening and fruit growing can hardly be overestimated. As to the danger of overdoing it and rendering our land liable to clover sickness, if we are judicious enough to keep our hard wood ashes at home and apply them as the main fertilizer of red clover, we need have no fear upon this score; (1) and while upon this subject I would like to call the attention of all intelligent clover growers to the fact that hard wood ashes are to-day advertised for sale in Philadelphia at \$2.50 per barrel, while we can buy them here for 25 cents and yet we send them away by train loads. Two things at present seem to tend towards making clover growing unpopular with those who are not familiar with its many good points; one is the supposed difficulty of curing it properly for hay, and the other is the confusion into which many of our seedsmen have thrown the distinguishing names of the different varieties of the common red clover. Your correspondent, Mr. J. Hayes Pantan, on page 30 of the *Farmer's Advocate*, has I believe, very correctly described the *Trifolium Medium* as cow-grass or zigzag clover, but is he right in also calling it Mammoth? *Trifolium Medium* is spoken of by Henry Stephens in his admirable *Farmers' Guide*, written over forty years ago, as follows:—I suspect that this true cow-clover has been confounded with the perennial variety of red clover, otherwise so worthless a weed would never have been recommended as a valuable constituent for our permanent pastures on light soils, where it never fails, by its obtrusive character, to destroy the more valuable pasture plants around it. The *Trifolium Medium* is inadmissible in alternate husbandry, on account of its creeping roots, constituting what in arable land is termed twitch. Dr. Stebler, director of the seed station of Zurich, says: "In agriculture two varieties (of red clover) are distinguished:—1. Wild clover or cow grass, *Trifolium Pratense Perenne*. 2. Cultivated red clover, *Trifolium Pratense var Sativum*. The height of the first is less, the root much branched and very fibrous, the stem is usually more hairy and full of pith (not hollow), and it has the following points of advantage over the other variety;—It lasts longer (for two or three years), is less sensitive to soil and climate: the crop is more certain and hay making easier. Cultivated red clover, the second variety, is a larger plant than the

former, and can only be used for a single year; the tap root branches little and produces few fibres: the stem is longer and usually hollow, and the flower generally lighter in colour. This variety is produced by cultivation, as is easily proved experimentally. If genuine seed is collected from wild cow-grass and sown for several generations, plants are obtained which cannot be distinguished from the variety *Sativum*. Also, when both varieties are planted together, for a few years the plants become similar in their mode of growth and properties, and of equal value." Dr. Stebler then goes on to describe red clovers of this same variety from seven different countries, each with different characteristic properties, so that we may naturally infer that we have in this country at least two different strains of the *Trifolium Pratense* on common red clover:—1st. What is known under the various names of "Western," "Common," "June," etc.; and 2nd, under the names of "Mammoth," "Peavine," "Long Vermont," etc., while the modern or improved cow-grass, *Trifolium Pratense Perenne*, is, I believe, a distinct variety, and has come originally from the *Trifolium Medium* or wild cow-grass, so strongly condemned by Mr. Stephens as "a worthless weed." Mr. Jenner Fust, manager of the Journal of Agriculture, an excellent authority upon all such subjects, gives it as his opinion that "the real cow-grass, *Trifolium Pratense Perenne*, is from a cross between *T. Medium* or wild cow-grass and *T. Pratense* or common red clover. In the illustrated dictionary of gardening by George Nicholson, curator Royal Botanic Gardens, Kew., he simply describes under the head of red clover, "*T. Medium*, cow grass, meadow or zigzag clover, and *T. Pratense*, red or broad leaved clover." In the Province of Quebec we have for many years, in describing red clovers, employed the following names:—1st, June or Western, 2nd, Rawdon, and 3rd, Long Vermont. The first, being ten days to a fortnight earlier than the others, was not considered a good mixture to put with timothy in seeding down, as it ripened before the grass and so became woody and apt to turn dark when cured with the hay; and to this fact may be attributed much of the prejudice which some have against clover growing. This variety ripens more in season with Orchard grass, and is therefore being employed as a mixture with it. The second, Rawdon, is larger than the Western, and being later is far more suited to seeding with timothy and is said to be hardier than the third, Long Vermont, between which and the Rawdon there seems to be very little difference; lately, however, we have been getting this third variety as Long Vermont, Cow-grass, Mammoth, Giant, Peavine, etc. etc., and I cannot help thinking that these names do not represent what we used to know as Long Vermont. I am now making a test of the matter, but do not expect to decide any definite results till the different plots have blossomed next season, and it is in such important matters as this that our Experimental Farm could so clearly decide and define, not only the comparative good points of these different strains, but the names under which each should be sold as well. In the Country Gentleman of Aug. 4th there appears a complaint from Colorado against the "Giant" clover, saying that "it is not *Trifolium Pratense*, that it produces one crop and then dies as completely as a crop of wheat or rye;" while during the past season there was a warning note

(1) Doubtful.—Ed.

(2) But the land must not be left harrowed to stand the winter: a deep fall-ploughing is necessary, and plenty of water-furrows. Ed.

(3) 500 lbs sufficient, but it depends upon quality.—Ed.

(4) 2 feet is wide enough.—Ed.

(1) 9 or 10.—Ed.

(2) 3 lbs. or even 4 lbs. are not too much, on account of the fly.—Ed.

(3) If ar, hear! —Ed.

(4) It was always supposed to be the case, but, in reality, it is probably only "cooked," so to speak.—Ed.

(1) Here, we beg to differ entirely from Mr. Hale. Lawes tried every means of curing clover-sickness, and failed utterly. "The fact is established that in the U. S. as well as in Europe, clover-sickness prevails wherever clover has been grown too long, or has been too frequently repeated." Again: Carruthers "concludes that it cannot be cured by manuring at all." For further information v. Lawes on clover-sickness, p. 94, vol. 1887, of this periodical.—Ed.