

ditch, and fewer still think of under drains. I intend to try some tile this fall, and hope to be able to speak or write practically in future of tile drains. If you want good crops the land must be well drained. Drain well, manure well, and you are pretty sure of a crop of almost anything you like to sow. Trusting in my next letter to be able to say that more fall ploughing, more ditching, and more draining have been done than usual,

I am, very truly yours,
PETER MACFARLANE.
Chateaugay, 5th Oct. 1896.

CULTIVATION OF MANGELS.

Fall cleaning—Dunging—Sowing— Kinds for difference soils.

In preparing the ground for Mangels, I begin to plough it as soon as the oats are harvested, generally about the middle of August. I plough the ground (1) to the depth of six inches at least. About three weeks after ploughing, I pass the heavy cultivator, and then the light harrows so as to kill the weeds that generally spring up after early ploughing. Then, about the first week of November, I plough again setting the furrow well up on edge, so that the frost may thoroughly pulverise it. I find for a good crop of mangels that it is best to cultivate the ground well in the fall, as the less cultivating we have to do in spring, in a dry climate like ours, the better crop we are likely to get. About the first week in May, I pass the harrows over the ground to break and level it. (2) Then I take the drill plough and open the drills twenty-seven inches apart, then fill the drills with good rotten farm yard manure at the rate of twenty-five to thirty tons per acre. Salt at the rate of from three to four hundred pounds per acre will increase the yield to a profitable extent, especially on black soil. Then, I pass the drill plough again, bringing the drills well up to a point, so as to cover all the manure. Then, I pass the circular harrows lightly on top of the drills so as to get a fine mould for covering the seed, then, I pass with the drill seeder on the top of the drill, sowing from four to five lbs per acre covering the seed to a uniform depth of half an inch. As soon as the plants are about three inches high, I thin them out eleven to fourteen inches (3) apart being always careful to leave the strongest plants. Then, after the plants have got set up, about one week after thinning, I pass the light cultivator between the drills to loosen the soil, and kill the weeds. Then, pass with the hoes singling out any doubles that may have been left in the first thinning. Then I pass with the drill plough lightly, through the soil on top of manure so as to keep the drought from getting at the roots of the mangels. Long varieties succeed best on a deep sandy loam and for heavy ground, I find the Intermediate, and globe varieties do the best. (4) But all varieties

(1) Far better use the grubber, or the 3-furrow stubble-paring plough, so as to keep the weeds atop.—Ed.

(2) Mr. Stalker's land must be very tender to admit of dunging up with only one harrowing!—Ed.

(3) Far too much space, as we always told Mr. Tuck. Mr. Stalker's predecessor.—Ed.

(4) We have always found it to be just the reverse.—Ed.

of Mangels want thorough cultivation, and plenty of good rotten farm yard manure.

(Signed) Alex. B. STALKER
Farmer for Dawes & Co.,
Willows Farm,
Lachine.

MANGEL AND KOHL RABI.

Preparation—Manures—Chain-harrows—Thinning.

When spring arrives, every advantage will be taken to complete the seeding of these crops, which, for general purposes, are the most useful of any of the root crops. Under favourable conditions both are heavy croppers, and may be stored and kept sound for a lengthened period. Mangel are the staff of the sheep-breeder during spring and early summer, whilst for cows in milk and the rearing of young stock they are invaluable. If on strong land, assuming the land has had a deep furrow early in the winter if after a cereal crop, and has since been drill and received a moderate dressing of farmyard manure, the drills should be split and exposed to the mellowing influences of rain and sunshine. Advantage should be taken of the first spell of dry weather, when a light chain-harrow is passed lengthways over the drills, forming a finely comminuted surface. On this should be sown broadcast a liberal dressing of phosphatic and potash manure, (1) the latter having been already supplied to some extent in the farmyard manure. A double mould-board plough is passed between the drills, the fine soil forming the drills, and if the land is dry the seed is at once sown. If dry enough, to prevent clogging, a roll of considerable weight should immediately be passed over the drills; this has the beneficial effect of causing the fine soil more closely to embrace the seed and enable the spongiolate of the infant plant to become more firmly established. Immediately the young plants make their appearance, a horse-hoe or small grubber should at once be set to work between the drills. By this means the soil is loosened and aerated, and nitrification encouraged. One-half to 1 cwt. of nitrate of soda should then be sown broadcast, and the horse-hoe continued. As soon as the young plants have emerged from the cotyledonous state and donned the rough leaf there should then be no delay in setting them out. To do this different practices obtain. In some districts the work is entirely accomplished by the use of the hoe. The plants are bunched by a stroke of the hoe, and are afterwards singled by the double action of a thrust and a pull. In this way the work can only be skillfully accomplished by trained workmen; when such cannot be had the plants should be bunched by a clean stroke of the hoe drawn towards the operator, and the plants singled by hand by a small boy or girl. The way in which the work of singling is performed, to a large extent influences the subsequent development and quality of the crop. A profusion of roots all round is not desirable. A single tap-root, with the necessary small feeders, is much pre-

(1) We prefer sulphate of ammonia, nitrogen being clearly indicated by the mangels, and potash being generally present in sufficient quantities in strong land.—Ed.

ferable. By clearing the soil well from the roots during the early stages of growth this can be ensured. (1) We are frequently met by the contention that roots cannot be grown on strong clay soils under ordinary conditions; when the land is worked in season the heaviest root crops can be grown.

GILBERT MURRAY.

THE TENACITY OF ALFALFA.

Yield per acre—Laughed at drought— The crop for poor land.

"Eds. Country Gentleman"—The tenacity of alfalfa when it gets firmly rooted, its vitality and vigorous growth under adverse circumstances, are really wonderful.

Six years ago I seeded a patch of two and a half acres, and since then have cut annually remarkable crops. It makes a slender, upright growth, affording little or no shade, and the weeds have a good chance.

The second year we put in another drill between the old drills, and let the crop take care of itself. The weeds were pretty well subdued, but then timothy and red-top came in. For two or three years the alfalfa was the principal crop, but now it is set in a carpet of grasses.

The first crop this year was part alfalfa and part timothy and red-top, cutting fully seven tons. The second crop, as well as the third, was pure alfalfa, and we have cut fully 12 tons, all told, from the two and a half acres. We had a spring drought, and what impressed me was the uninterrupted growth the alfalfa made without any apparent concern for the dry weather. When the grass had reached above two inches in growth, the leaves seemed to die down to the roots, but the alfalfa kept right on growing. Subsequent rains started the grass, and our first cutting was a grand mixed crop.

I do not expect we shall be able to subdue the grass, but I see no reason why we may not cut large crops of hay from this patch for three or four years to come. The grass may run out—I wish it would—and then I would count on a big yield of pure alfalfa for years to come by the use of manure in top-dressing. In my judgment the land was too rich and too full of seeds of both weeds and grass for the best results with this special crop. Some time since a western correspondent—from Colorado I think—said when they had any land too poor for any other crop they seeded it with alfalfa. It does not require rich soil to make a start, and a thin, sandy loam, in which weeds will not riot, is the best for the purpose.

With my poor success in keeping the weeds and grasses in check, this plot has nevertheless produced three times the burden of fodder borne by any other plot of similar size on the farm. Farmers should experiment with it and learn how to grow it. According to my experience and observation, there is no fodder crop that will compare with it for profitable yield.

G. W. FARLEE

Bergen County N. J.

(1) This we agree with, as we have often said. Mr. Stalker is wrong, in our opinion. See his essay above.—Ed.

RENOVATING PASTURES.

Manure—Land selects its own grasses—
Harrowing and rolling—Worms' work—Grasses and clovers antagonistic—Besoil-slag and nitrate of soda.

The most important agent in renovating pastures is manure. If plenty of manure is applied, then seed is specially useful. The cultivation permissible is limited, because it is confined to the surface, and little can be done beyond harrowing and rolling. Seeding alone is rarely of much good; something exceptional, such as want of drainage, must have been present to cause the plant of an old pasture to die out, provided there was sufficient manure available to produce a full plant. Poverty is generally the cause of failure. Land lying in grass for a number of years produces these grasses it is best able to carry. If well manured the better grasses increase; if further robbed by the crop being taken away and nothing being returned, the proper grasses gradually shove out the better. The sowing of poor varieties of grasses on a rich old pasture, being maintained in its fertility, would not have a great influence on it, as the richer grasses are there because they have shoved out the inferior, and, although the inferior may be induced to germinate and perhaps grow for a time, they will soon have to give way to those which are there because the surrounding are favourable to their growth. If the seeds of richer grasses are sown on a worn-out pasture receiving no manurial help, they may germinate and take root, but they will soon be ousted. The richer grasses would have been there already, had the soil been able to maintain them. As soon as fertility is increased better grasses may be sown, because the land has been rendered capable of producing something better than existed before it was altered by the addition of food for the grasses. Manure and seeds must therefore go hand in hand, although, as before stated, if the condition of the land is improved the herbage will improve also; but the improvement is gradual, and it is hastened if seeds of good varieties are sown with it, for, instead of the plants of the better varieties having to force their way, each new plant becomes an attacking force which will establish itself to the discomfort of the lower type of grass, even though the inferior grass is a larger-growing plant than the one with better nutritive properties.

Harrowing and rolling are beneficial because they cultivate the soil to some extent, and the advantages of cultivation are felt by grasses and clovers as much as by other farm crops; they require air to be let into the soil to convert the manurial substances into an available form of plant food. There is reason to suppose that special good is done in the case of clover, as it is probable that it has an effect on the amount of nitrogen the plants are able to assimilate through the medium of the nodules. Beyond the mechanical effect of loosening the soil, moss is torn up, and, instead of drawing on the food supply in the soil, it is left there dead, to be consumed by worms and converted into manure. Broadly speaking, a permanent pasture cannot be harrowed too much, and, within reason, a younger ley will stand a considerable amount of rough treatment. Provided