

and am quite of opinion that great benefit may be derived from its use, but it requires two teams to do the work well, and it also has many faults that, I have no doubt, will be eventually got over.

Our plan is to construct angular board drains by putting together, in the form of an inverted A, two boards bevelled so as to form an angle more acute than a right angle. I have witnessed the action of great quantities of this drain, and where laid in a subsoil that does not wash, nothing can do better, especially if kept nearly level. The drain box should be formed of a ten-inch board divided obliquely through the centre. This saves lumber, and makes a perfect drain, and the angle formed by putting both bevelled parts together offers great resistance to breaking in from the weight of earth above. About four nails in each twelve foot length will keep all steady until the earth completes the security of the drain by its weight. This plan affords the largest drain, and of the best shape, for the smallest quantity of lumber used. In some of my visits to others I saw drains of all shapes and sizes, but nowhere did I see any one so cheap and easily made.

No branch of industry is so open to improvement as a good, efficient, and easily worked draining machine. Some inventive genius will, no doubt, ere long meet this great want, and make a splendid fortune out of it. The great essential is to make a ditch about nine inches wide with one team, and to do this by continuously passing over the same ground. The machine must not cost more than \$30; and at that price one hundred can be sold from one factory annually

C.

A Backwoods Farm.

SEEDING DOWN WITH TIMOTHY AND CLOVER.

So much has been written about the best season for this operation, that one scarcely knows which course is the best. My belief, as well as my experience, certainly is that almost any course will succeed, provided you do not bury the seed too deep, and you have a moist time to sow in, and a most important addition, namely, that the season happens to be suitable for the course you adopt.

We tried many experiments in thick and thin seeding, and succeeded best where about two pounds of broad, two pounds of Alsike, and two pounds of timothy, were sown to the acre; but then the season was exceedingly favourable in this instance. We tried ten pounds of broad clover alone to test the plant with—five pounds also alone—thus placing side by side double the quantity of seed per acre, and on the whole we had the heaviest crop from the five pounds. The ten pounds were certainly too crowded, and consequently too spindling, and al-

though very thick, the stalk was short. In this experiment both were sown during the same rain-storm, and in the same field, side by side; so the experiment was a fair one. I once tried seeding down 20 acres of new land in the fall, after the wheat crop had been taken off. All the seed came up well enough, but most of it perished by the winter frost.

Now, a more favourable season might have given much better results. I also once tried seeding down 35 acres of wheat stubble land in the spring, with timothy and clover. Our desire was to get fall feed as early as possible for a quantity of young stock. I had harrowed the land twice, once each way, and sowed on the seed at the before mentioned rate of two pounds of broad, two of Alsike clover, and two of timothy. It all came up, and there was an immense quantity of feed the same fall; but of course it was thin, as it had not stood out to any extent. This ought to have been cut for hay, and there certainly would have been at least 25 tons on the piece, but labour was very high, and hay plentiful, combined with a late hay-making some time in September, towards the latter end, preventing my doing so, and moreover, I wanted the feed badly. The feed, however, was stalky, late and coarse, and the cattle did not eat it very well, but the plan succeeded admirably, and I am confident I realized a good rent for the land from the pasturage thus obtained. The next year we cut an enormous quantity of the best hay, so, on the whole, it paid us pretty well. The expenses were light, and we had plenty of other work at the time to do, without putting the land to a more profitable use by sowing a crop in the preceding spring, and seeding down with it.

I noticed one great peculiarity about the action of seeding down on Canada thistles. Where the seed took well, and the land was mowed the following year for hay, the thistles were for the most part killed or greatly checked, but the pasturing did not seem to injure their growth at all, so we may safely conclude that all the benefit derived from this course lay in cutting the thistle in June or July, when it was in full flower, and not that the clover killed them. The following year there were none to speak of amongst the hay.

The greatest difficulty we experienced was the injury done by the feet of the cattle in wet fall weather, and our attention was necessarily turned towards the best method of draining.

BEST ROOT SUGAR.—A subscriber wishes to know what are "the best books treating on Beet Root Sugar." The best and latest English authority on the subject is entitled "Beet Root and Beet Root Sugar," by William Crookes, editor of *Chemical News*, published July 1870; can be ordered through any of the Toronto booksellers.

Our Roads.

II.

BY ALAN MACDOUGALL, C. E.

Improvement does not apply only to those places that are already well to do, with well cultivated lands and good steadings. It really applies most chiefly to places that are backward, and the further backward a district is, the effects of a little improvement are far more readily discerned than the outlay of large sums in well settled lands. The breaking in of ten acres of bush land is a greater step and more valuable than the money expended in older districts in the erection of costly buildings.

So it is with our roads; we must learn to look upon them as the arteries and blood-vessels of the country. Emanating from the centres of busy life, they push out far into back roads, carrying learning, religion, and refinement with them; conquering the elements of nature, they conquer man in time, and bring him to see the blessings of education. Following the line of a road for forty or fifty miles, one would come across a great many different kinds of cultivation, and with these changes in agriculture, changes in the road—from the gravel road near a town to the bush road of the backwoods.

Sometimes roads in districts where good materials for their construction abound, are completely neglected; sometimes in clay countries, the roads, though excellent during dry weather, after rain become completely impassable. All these need to be treated very much in one way, and that way I shall endeavour to explain in a few homely words:—

We all know at the outset that the first thing to do to improve a road is to have it graded, that is, to endeavour to have an uniform surface upon it, cutting off the crests of hills and filling up hollows, giving the road bed a defined shape and width, and making allowances for the escape of water by ditches and culverts.

In carrying out grades, it is a point of great importance to have them so adjusted that after a load has been brought to a certain height, it is not allowed to descend before it completes the ascent, but rather that a resting-place be formed either on a level or a slightly ascending grade. I do not allude by this to the ascent of steep hills, but to the regular run of the country. Many roads, following too much the surface of the country, rise and fall gradually; first a rise of five feet is overcome, then a slope of four feet brings one to a point only one foot higher than he was 300 yards off, and so on, perhaps, he goes for miles. Many think this is a very good thing, as it eases the weight on the horse, but it is contrary to the example and practice of great English engineers, who have made some of the finest roads, I suppose, in the world.