

tion is to be done, and then only in order to break up hard lumps, and enable the plough to turn up fresh soil, instead of merely pushing aside what has already been turned up and exposed. To obtain the greatest advantage of summer-fallowing it is well to regulate the ploughing so that a fresh layer of soil is exposed at each turning over, which can be done by gauging the plough so as to run at a different depth each time. If the first turning over consists of a sod turned at three inches, in order to rot quickly, the next should be an inch or two deeper, the third still deeper, and the last may be half the depth between the first and last, so as to bring as much as possible of the already ameliorated soil nearest the surface at the time of sowing the wheat. If there is a hard-pan at no great depth, which is often the case in clays that have been cultivated for years, it is well, at the second or third ploughing, to have the subsoil plough, or a second plough with the mould-board and coulter taken off, to follow in the furrow and break up the hard-pan, without bringing the subsoil to the surface.

Another object in summer-fallowing, and one especially desirable of accomplishment in sections of country where the soil is naturally rich and not even clayey, but full of inequalities from cradle knolls and stump holes, is to get the surface levelled and into good tilth, preparatory to being seeded down or brought into the rotation after being stumped. An old grass field, full of rotten stumps, is broken up and summer-fallowed, the stumps being pulled out and burnt as the process of fallowing proceeds. In this case a great deal of harrowing will be required to tear out roots and drag the soil into the hollows till the surface has become somewhat levelled and brought under tillage. A crop of wheat on such soils may often be succeeded by a second fall fallowing to still more level the surface and deepen the soil; and if it be naturally fertile, which will be the case in most instances, another grain crop may be taken before seeding it down to grass. We have known a second crop of wheat, on such land, to exceed the first in productiveness, and if the fertility of the soil is well husbanded by not allowing more than a second grain crop to be taken before seeding down to grass, it will yield good crops for many years.

Still another object, and one that renders it necessary often to fallow land of a light nature, or that is unsuitable to winter wheat, is the getting rid of weeds that infest the soil to an extent that precludes a probability of growing any crop advantageously till the land has been cleaned, and rendered capable of being seeded with clover, to be afterwards turned under as a green crop to manure the land. In this case the main object is to kill out the weeds, which can be most quickly and cheaply accomplished by successive grubbing with a three-horse cultivator, followed by the harrow, the process being re-

peated from time to time as the surface gets green with a fresh coat of weeds. The land must, of course, be first ploughed, and if it gets compacted again, a second ploughing may be necessary to loosen the soil and allow the cultivator to work freely through it. The effect of the cultivator and harrow on such soils is to tear out the weeds by the roots, leaving them exposed on the surface to be killed by the sun, while at the same time any seeds in the soil are brought up to germinate, instead of being left in the soil to remain dormant, as would be the case were they turned under to a depth of several inches by the plough.

The changes produced in a clayey soil by fallowing are often much greater than would be supposed. Among these effects may be placed an increase of the power of absorption, a greater friability, and permeability to the roots of plants, a strengthening of its affinities for vegetable and animal matter, making manure when applied more easily decomposed, instead of remaining inert in the stiff soil, and generally a restoring of the productive capabilities of such soils, which have not been in most cases exhausted, or even greatly diminished, but are simply inert and dormant for want of cultivation.

Mowing Machines.

There is no greater help to the farmer in his labours than a really first-class mower. Such a machine, that will do first-class work with expedition and certainty, without being liable to get out of repair, clog, or require too often renewing of the knives, yet having a light draught for the team, so that they can work from morning to night without being too much pulled down, is yet a great desideratum in Canada. We have mowers, it is true, and enough of them, but they mostly belong to what are called the combined class, and though passably good, are not specially adapted to the cutting of grass, particularly clover, and heavy crops of timothy. The friction and heavy draught of these combined machines, which, in point of fact, are reapers, not mowers, do not tell so severely on the team in standing grain, where the labour of cutting is comparatively light, as in grass, where, especially when lodged, the cutting power required is enormous. All farmers know practically that mowing heavy grass is much more laborious work than cradling grain, and that a man who can cut an acre of grass a day accomplishes more actual hard work than he who cradles two acres of grain. What is required in a mower is strength combined with lightness, and a very keen yet sure-cutting edge to the knives, worked in such a manner as to ensure rapidity of action, without liability to clog from the expressed juices of the succulent foliage they work among. A mower requires to be light, compact, and strong, while a reaper, meeting with comparatively little resistance in a grain crop, and having

its knives working at a much higher elevation, in dry straw, can be made of coarser and heavier construction without materially adding to the draught, yet considerably reducing the cost of the machine.

A good mowing machine is of more importance than a good reaper, if we are to have good hay. It is all important that the grass should be cut and saved in a given space of time, for after once it reaches the proper point, it very quickly goes beyond it, and becomes greatly diminished in value as regards its nutritive qualities, while grain does not.

Another thing, mowing by hand is such laborious work that, in the present fast age, when men desire to live with as little actual hard labour as possible, it is a much more difficult matter to get the work done by human muscle than by brute force, so that even if the actual cost of the two forces were nearly alike in producing a ton of hay, the one is uncertain as to time and inclination, while the other is completely at our disposal, and can be depended on with certainty to accomplish a given amount of work in a given time. That is the all-important question in haymaking, and with tedders to follow the mower and distribute the grass evenly, and horse-rakes to get it together again, the farmer can save his hay at a comparatively small cost now to what was formerly the case, and still have for his stock an article of provender very superior to that of days gone by.

Underdraining.

The following article from a correspondent in the *American Agriculturist* tells so many important truths, in such forcible and plain language, that we entreat our readers to study it well, and when once they have mastered all its points, they will have become thorough advocates of underdraining:—

“Ogden Farm finds encouragement in the following passage in the Hon. George Geddes' *Essay on Wheat Culture*. ‘Undrained clay lands are never worn out, for the owner that lacks the energy to free them from stagnant water, never has force enough to exhaust their fertility by cropping. Manure on such land is nearly thrown away. Draining is the first thing to be done; next, thorough cultivation, then manure. Whoever reverses this order throws away his money and his labour.’

“This would be a good text for every farmer to keep constantly in mind. The profit of farming comes entirely from the surplus of production beyond the grand total of the cost of interest, labour, seed, manure, and wear and tear. These are nearly fixed quantities. They are at least as great, in the aggregate, with medium crops as with good ones. If thirty bushels of corn to the acre will barely return the outlay, sixty bushels may give a clear profit equal to the value of thirty bushels. There are thousands of farms in the