

The Farm.

Grasses and Clovers.

IV.

LUCERNE (*Medicago sativa*) is a variety of clover known for a long period of years to the inhabitants of continental Europe, some of the nations being conversant with it for more than two thousand years. It is known by a large number of names, the most important of which are Lucerne, derived from the French, and Alfalfa, a Spanish name. Some of the other names not so frequently used are:—Chilian and French Clovers, Spanish Trefoil and Purple Medick.

Prof. Beal, in his work on "Grasses of North America," describes it as "an upright, deeply-rooting, smooth perennial, 1 to 2½ feet high, leaflets obovate-oblong, toothed, tip notched, flowers in a short dense raceme, (flowers attached by a small separate stem, peduncle, to a central stalk, similar to the currant), blue or purple; peduncles longer than the leaves; pod, ½ inch in diameter, spirally twisted."

Lucerne is specially recommended for soiling purposes. It commences growth very early in spring, grows rapidly, and produces a large number of successive crops, furnishing a large bulk of food for a large number of years. It has been known to flourish for over 20 years. Care must be taken not to feed it when wet or frosted, as it is then very injurious to the animal system—more so than the red clover. It is frequently cured for hay, but as its leaves are very liable to be lost great care must be taken in the drying. As it turns to woody fiber very rapidly during the latter stages of its growth, it should always be cut when commencing to bloom, when it contains the largest amount of nutriment. Horses relish the coarser portions of this hay, while cattle favor the finer parts. Some writers claim that the hay is very liable to cause bloating if fed to excess, and care should therefore be taken not to overfeed animals with it.

The plant, being deep-rooted, sometimes having been traced to a depth of 16 feet, will withstand drought marvelously well, flourishing when nearly everything else fails. A wet, cold climate is very detrimental to its growth; dry cold does not seriously affect it, and a dry, warm, sunny district is most favorable to it. It does not reach its greatest productive power till about the third year after being sown. For the first two years of its growth it is easily crowded out by weeds or grasses. In countries where labor is cheap it is therefore generally sown in drills, and weeded or cultivated between the rows. In Canada good results have, however, been obtained by sowing it broadcast (with and without a foster crop) in a clean field.

It flourishes, if once established, on all soils lying on a loose, warm, well-drained, calcareous subsoil. It is useless to sow it on soils having a cold, stiff or water-lodged subsoil.

WHITE CLOVER (*Trifolium repens*) is a low creeping variety, growing on almost all soils. It is very valuable for pastures, but is said to make horses "slobber" if they eat it when it is ripening its seeds. It rarely requires to be sown, as it spreads very rapidly, and is almost sure to appear in all the older meadows and pastures. It forms a very close sod, and should therefore be included in all lawn mixtures. As a clover for bees it stands second to Alsike.

YELLOW CLOVER (*Medicago sativa*), also called

Black Medick, is a small, creeping variety, which gives an early bite in spring, but does not yield a second crop. It is a biennial, and thrives on most soils, but especially on those containing an abundance of lime. Like White Clover, its low growth makes it of little value in a meadow. When used for pastures it should form only a small portion of the mixture.

First Prize Essay on Farm Drainage.

BY W. A. HALE, SHERBROOKE, P. Q.

The question of farm drainage is so comprehensive a one that to do it proper justice within the limited space of an essay is an extremely difficult undertaking. Volumes might be written upon the subject and yet much left untold. In the following paper, therefore, I shall not attempt to do more than give a general outline of the various modes employed, leaving the study of the minute details, necessary to the successful carrying out of the same, to those who contemplate engaging in the work and for whose benefit much valuable information can be found in the back volumes of the various agricultural papers and in books written especially upon the subject; for let it at the commencement be thoroughly well understood that this is an undertaking which, though not in itself difficult, is one which is far better to leave entirely undone than to do it in any but the most thorough and workman-like manner. To such soils as require draining the benefits derived from the operation are manifold; compact soils are rendered more open and friable year by year by removing all undue moisture, and substituting therefor atmospheric air, which greatly assists in the chemical preparation of the plant-food contained in the organic portions of the soil. Rain water is more easily absorbed, and in consequence surface washing very materially diminished, and by checking evaporation the temperature of the earth is noticeably raised even to the extent of from 5 to 15 degrees—a fact which market gardeners and those anxious to escape early frosts should not lose sight of. The products of the land are not only largely increased in yield, but the quality of the same is in most cases much improved. Properties detrimental to vegetation are washed out of the soil and carried off by the drains, while the nourishing portions contained in the vegetable mould and supplying the food for the growing crops, being so slightly soluble, are all taken up by the roots (unless, perhaps, in the case of bare summer fallow), long before they reach the depth at which the drains should be. Plowing, harrowing and cultivating can be done not only with much greater ease, but also at an earlier date, and in really boggy soils without the distress and even danger to the teams. All fertilizers respond more quickly and profitably on a well-drained soil, and the freedom from rot and rust in a damp season, and the decreased ill-effects from drought in a dry one, are but a few among the many advantages that go to repay the provident farmer who makes so wise an investment of his money. The air also of a well-drained district, even where malaria does not exist, is pleasanter and healthier, and the vast decrease in the number of mosquitoes, where actual swamps and swales have been drained, is a point which will be appreciated by every member of the family.

Taking it for granted that drainage, either natural or artificial, is a thing to be desired, the

most important point to decide is whether it will pay or not. We often hear it said that good naturally drained land can be bought in the North-west for less than the cost of draining land in Ontario or Quebec. This may be, but it hardly affects the subject on hand, for I fancy there are but few who would wish to sever family ties and old associations for the sake of saving the cost of draining such of the old homestead as requires it. Just what the expense of underdraining an acre of land would be is, owing to the different cost of labor and material in different parts of the country, very hard to establish, but \$40 an acre should safely cover all, even where all the labor has to be paid for. We are told by those who have made a study of it that this outlay is often repaid in from two to three years—equal to a return of from 33 percent. to 50 percent. Or suppose we allow 10 percent. annually upon the outlay, we have a charge of \$4 per annum, to meet which an increase of only 10 bus. of potatoes per acre would be required; but as we might reasonably expect an increase of 50 bushels per acre, we should in this case be receiving 50 percent. on our outlay. And the personal testimony of such men as Thomas Irvine, of Montreal, goes to prove that no investment on the farm pays so well as a thorough system of underdraining land where it is needed. Being convinced that underdrainage is good and the investment wise, it is of no less importance to ascertain what portions of our land require it and what portions do not; for while it is true that some soils do not need artificial drainage, it is equally true that some, and generally, too, our very best soils, are not worth cultivating or even pasturing without it. Between these two extremes there are soils which are in a greater or less degree improved by it, and to find out just where to draw the line between mere improvement and profit is where our best judgment is most required. Ordinary swamps, swales, boggy places and springs speak for themselves. Plowed fields showing continued dark portions, while the remainder is dry; water standing on the surface after rain, cracking of the soil in a dry time, marsh grass, moss or water ferns scattered over old meadows, water standing in test pits dug three feet deep for even a short time at any season of the year, are sure and certain signs that drainage is required, and for soils in which clay, clayey loam, or hard pan exists either near the surface or within three feet of it, depend upon it underdraining is the thing of all others here most required, while loamy or sandy soils resting on a sandy, gravelly, or alluvial subsoil are generally sufficiently well-drained by nature.

Where natural watercourses exist, these, if crooked, should be straightened with plow, scraper and spade, and used as the outfalls for the drains, whether covered or open, and where artificial outfalls, either along boundary fences, or along road sides, have to be formed, their sides should be, if possible, even of a lower slope than an angle of 45 degrees. Emptying into these with a slight fall, the main drains should commence running up the lowest parts of the hollows, so as to allow as free a discharge of the laterals into them as possible. The laterals being the same depth as the mains, from 3 to 4 feet, and from 18 to 40 feet apart, depending upon the retentive character of the soil, should always run parallel and as directly down the slopes as possible.