

FOR THE CANADIAN LIVE-STOCK AND FARM JOURNAL.

**Land Drainage.**

BY A. E. MEYER, KOSSUTH, ONT.

(Third Paper.)

The drains should, if possible, be laid at a depth of three feet, and never less than two feet and a half. This applies to land under cultivation. In pasture lands two and a half feet will suffice. Great care should be taken in laying the tile, as the effective working of the drains is largely dependent upon this. It is a matter of much importance that the tiles should be large enough for the amount of water they are required to carry off. Tiles of less dimensions will suffice where there is considerable fall, than where the fall is not so great.

When a field is to be drained the main drain should be dug along the lower edge of the same, parallel to its side, from which it may be distant five yards or more, and at least three feet deep—deeper, if possible. This of course requires larger tiles than the branch drain, as it carries off all the water emptied into it by these minor drains. These should be laid up the slope when not too steep, and should be from two to two and a half inches as a rule. It is not necessary to put straw or any such material over them before filling the drains.

The labor of digging may be economized by ploughing a double furrow along the line of each drain. Much valuable time would be saved if those intending to drain land would draw their tiles in the winter, and the labor of drawing would also be lessened.

The influence which drainage exerts in increasing the agricultural productiveness of a country cannot be doubted by any who have observed the condition to which agriculture has been raised in England within the past fifty years. The greater portion of this success is attributed to the adoption of a thorough system of drainage.

The land in this climate stands undoubtedly more in need of drainage than that of England, on account of our rainfall not being so great. We require that every drop of water shall percolate our soil, consequently we cannot afford to lose any of those heavy showers which rush over the surface of our land, rather to the detriment than to the nutrition of the crop.

Perfect agriculture is the basis of all trade, so that the prosperity of Canada is almost entirely dependent upon her agricultural progression. And in no way can the productiveness of our land be increased to so great an extent as by the adoption of a thorough system of under-drainage.

(Concluded.)

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**Weeds.**

I.

BY PROF. J. HOYES PAXTON, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Hitherto, farming in Canada has been carried on in a somewhat careless manner by many farmers. Many of the early settlers were not farmers, but coming into the possession of a rich virgin soil, they were able to secure excellent results notwithstanding their ignorance of many principles which lie at the foundation of a proper cultivation of the soil. Thus we see to-day many wealthy farmers in different parts of our Province that are a marvel to themselves, when they consider how little they knew of the calling, which in a new country led up to such enviable results. They are beginning to grumble at the meagre profits which follow effort at the present stage in Canadian farming. They find the work must be pursued in a different

way than the haphazard, careless method of the past. The early fertility of the soil has gone. It could not have been otherwise, for it furnished plant food without a return being made to supply the constant drain upon the soil. Competition has arisen, and the market has become fickle. With these conditions surrounding him, he who would succeed as a farmer is driven to pursue it in a much more intelligent manner than many have in the past. I shall only enumerate one of the lines along which a change must be made, i.e., thorough cultivation of the soil, and in mentioning this it is because it includes the mention of *Weeds*, their nature, and some of the methods essential to get rid of them. Among farmers, there are some that have been very kind to these waifs in plant life, and have always shown their benevolence by feeding nearly as many weeds as the plants intended for a crop. No one in feeding their cattle would quietly stand by and see some from another herd step in and take away what was meant for his own, and yet this is just what is occurring in fields where a crop is sown and weeds allowed to grow. The weeds are taking food from your wheat or other plants, and become a nuisance, appropriating valuable space, and living on the food of useful plants. With a view to bringing the question of weeds before the numerous readers of this journal, I purpose writing a series of papers, as time will permit. But, before entering upon the nature, etc., of the individual plants, it is expedient to make some preliminary observations on weeds in general.

**DEFINITION OF A WEED.**

Among the many definitions given, the following may be selected:

1. Any rank or wild plant that grows of itself.
2. A useless plant.
3. A plant injuring the crop with which it grows.
4. A plant out of place, or in other words, a plant growing where it should not.

The last is likely nearest a farmer's idea of a weed. This being the case, any plant becomes a weed if not in the proper place. The flowers we cultivated in the garden become weeds, and sometimes serious ones, when they appear in fields of grain, e.g., poppy, cockle and toadflax.

But there are some plants so frequently out of place, that they have been known to us always as weeds, and it is to the consideration of these your attention is more particularly directed.

**INCREASE OF WEEDS.**

I think you will agree with me, that weeds are on the increase in Ontario. This may be accounted for by the indifference of many farmers to the growth of weeds on the roadside, and to the tendency now of introducing a change of seed from other districts. Within the past few years several new weeds have appeared, some of which have no doubt been brought from other districts in new seed. This came under my observation very markedly last year. A plant was sent from the eastern part of the Province for identification. An examination of it showed that it was the so-called "French Weed" "Penny-cress", of the Red River Valley, where it grows in abundance, and in some cases has almost over-run farms in the vicinity of Winnipeg. Likely it has come from that place in imported wheat. Reference will be made more fully to this plant in a subsequent paper.

In Ontario we have about 150 species of plants, commonly known as weeds, and of these, nearly 100 have been introduced from Europe. Every year adds a few more foreigners, and, if farmers are not more vigilant in the selection of seed, we shall soon find ourselves with the number greatly increased.

**SEED-PRODUCING POWER OF WEEDS.**

To give you some idea of the number of seeds produced by our most common forms among weeds, the following figures will be of interest.

Wild Carrot, 1,200; dandelion, 1,500; chickweed, 2,000; cockle, 3,200; campion, 3,425; chess, 3,500; dock, 3,700; ragweed, 4,372; groundsel, 6,500; ox-eye daisy, 9,600; mallow, 16,500; motherwort, 18,000; fox-tail, 19,500; sow thistle, 19,000; mustard, 31,000; Canadian thistle, 42,000; red poppy, 50,000; shepherd's purse, 62,500; bull thistle, 65,366; burdock, 400,328; purslane, 500,000; lamb's quarters, 825,000.

When we consider the wonderful productive power and the vitality possessed by weeds, together with the peculiar mode by which many are distributed, the surprise is that we are not over-run more than we are, especially when located near careless, indifferent neighbors.

**MEANS BY WHICH WEEDS ARE DISTRIBUTED.**

1. Along with grain imported from other districts.
2. Animals carrying seeds attached to their bodies, e.g., burr.
3. The nature of the seeds; some winged or supplied with hair-like appendages, are enabled to float long distances by the wind, e.g., dock, thistle.
4. The immense number of seeds, and the vitality of some, keep up a continued supply e.g., burdock, mustard.
5. Threshing machines carry seeds from one farm to another.
6. Manure brought from city stables.
7. Renting farms.

**Improved Temporary Pasture and Milk Production.**

BULLETIN XX.

BY WM. BROWN, C. E., PROFESSOR OF AGRICULTURE.

Some may think we have said enough about pasture during the past five years, and that experiments are now conclusive as to what can be done for its improvement. It seems, however, to be desirable to close the season with some additional facts, and under new aspects.

Hitherto our work in testing mixture of grasses and clovers has been termed *permanent* pasture, because the object is the maintenance of such a crop for many years, perhaps even for all the time that several generations can remember, of which we have examples in older lands. But, as it is difficult to grasp the full significance of what goes so far away from our yearly practice, we shall look at this class of pasture as if it had been connected with an ordinary rotation of crops, where, after two years' hay there is usually two or three years' pasturing before breaking up for another succession. Thus we hope to bring home to everybody one of the duties of the day in connection with Canadian dairying.

We seeded in 1884 without a grain crop, and took hay the same year; it could as well have been with a crop of grain. In 1885 we grazed and obtained 7,800 lbs. of milk per acre; it could as well have been another crop of hay. We also grazed in 1886 6,670 lbs. of milk. This, therefore, would be a system of one year's hay and two years' pasture, applicable to some soils and grain-growing districts. The result here would have been a mean annual milk crop of 7,235 lbs. per acre, with \$61 for butter and skim-milk. Had the same land been laid down in timothy and clover, and an average of the Province realized (that is 1,300 lbs. of milk per acre), the revenue would stand at \$11 per acre. Against the mixture of grasses is the sum of \$3.50 as the difference between \$5 for seed and the ordinary \$1.50 of timothy and red clover, for there should not be any for management and manures. Hence, during two years, the improved pasture gave \$55 per acre over all the profits of the ordinary runs for Ontario cows.

But, possibly, neither of these pastures are at their best in three years, and a longer rotation may be desirable.