

Drainage sets all these natural forces in motion, and they open the soil and disintegrate its particles for the benefit of the plant life upon it.

Again, drainage is always beneficial in promoting the early and late growth of grass, and this is of enormous value in feeding stock. The early autumn and late spring frosts do not stop growth on drained land so quickly as on that which is sodden with moisture. And on the latter there is also the additional injury which the hoofs of cattle inflict on the grasses.

Thus one of the effects of drainage is to produce a continually growing crop. It is often said, and with perfect truth, that from arable land manures often washed into drains, especially in wet seasons, and that in draining, a farmer may be providing an outlet for manure which he has placed on the surface at a good deal of expense. But it has been proved by experiments that the loss of fertilisers by means of the drains is practically nil when a green crop is on the ground.

Therefore, the grass farmer is protected from this particular loss as the arable farmer cannot always be. The only exception is the possible loss of lime. This very necessary constituent of plant life is one of the substances most easily lost by the drains, and it accounts for the necessity of applying this mineral from time to time on drained land which happens to be deficient in it.

It may be accepted as a general truth that grass land should not be drained so deeply as arable land, and there is no doubt that grass can advantageously take more water than grain crops. Besides, the roots of most grasses do not penetrate very deep, and therefore it is desirable to have the water somewhat nearer the surface than on the arable part of the farm.

The manner in which drainage should be carried out in any particular case depends on soil, climate and other considerations. The difference in the rainfall of the particular district and the kind of land, will regulate the nearness of the lines of drains and the size of the pipes to be used. But these differences do not touch the main question whether to drain or not to drain.

All soils which rest on a porous subsoil certainly do not need it. Other land may be retentive, and yet lie so high, or at such a steep inclination, that the water is discharged with sufficient rapidity without artificial aid. Indeed, drainage may always be considered unnecessary where the best natural grasses thrive and grow luxuriantly.

With these exceptions, all clay land, whether the clay is only in the subsoil or rises to the surface, and all peaty and boggy soils, and in fact all land which is habitually saturated with water, must be effectually drained before a pasture worth having can be properly established.

The prejudice which often exists against the adoption of a system of drainage can generally be traced to some instance where the workmanship has been bad and consequently the result has been unsatisfactory, (1) or where no care has been taken afterwards to maintain the efficiency of the drains.

As draining is usually put out to contract, great care should be taken by the farmer or land owner to see that the work is done in a proper manner, otherwise disappointment will ensue.

It is a safe general rule not to make any single drain too long, and plenty of fall should always be given or the drain may not work well after it has been laid some time.

A good fall renders drains to a certain extent self-cleansing, and the small drains should not enter the large drains at right angles, but always obliquely, so that the water may retain the momentum it has got in its previous course. (2)

Then the occasional flushing after a sharp storm will prevent the pipes from becoming choked. Where land has been drained in this province of Quebec, the greater part of the work has been done by means of stone or wooden drains. These are old fashioned methods nowadays and it will be found far more effectual and cheaper to use tile drains. These pipe-tiles are made of burnt clay. There are two or three different shapes made but the best appear to be the round ones since in laying them they can be so turned as to make close joints. Tiles are usually about 13 inches long but now longer ones are often used. (3)

In ordinary drains pipes from two to three inches in diameter are employed ; but in some drains they are used a good deal larger. (4)

In draining land we generally have a system of drains consisting of main drains, submains, and laterals.

(1) Oh! very true indeed.—Ed.

(2) Capital advice.—Ed.

(3) A foot is long enough.—Ed.

(4) Lots of land, in England, we drained most perfectly with $1\frac{1}{2}$ in. for side, and $2\frac{1}{2}$ in. for main drains.—Ed.