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Trade increases the wealth and glory of a country; but its real strength and stamina are to be looked for among the cultivators of the land.—Lord Chotham

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Does Underdrainage Pay?—Some 1916 Experiences The Advantages of Having Land Well Drained

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DOES it pay to underdrain? That is placing the matter upon a too strictly utilitarian basis, but drainage is a matter of fact. business. Some farm operations can be urged from motives of good taste as well as from those of profit. It can be shown that aside from the increased revenues they will ensure to the farmer, there is also a return in the increased satisfaction they enable him to get out of his life work. But this is not the case with underdrainage. It must be judged from the straight dollars and cents' standpoint, for a string of tile buried several feet under ground do not add to the appearance of any man's farm. Before a farmer undertakes to install an expensive system of the drainage, therefore, he has a right to ask if the increased yields of his fields will justify the expenditure.

The men best qualified to answer the question, "Does underdrainage pay?" are those who have tried it out on their own farms. They are especially qualified to do so if, during such a spring season as we have had this year, they have had the experience of working both drained and undrained land, for then they are in a position to judge by comparison. Recently I had the opportunity of visiting a few of such men on their farms, and they are enthusiastic regarding the benefits of a thorough system of under drains in low lying land and sanguine as to its ability to pay for itself within a reasonable time.

My first visit was to the farms of Beecher and Sandy Matchett, of Peterboro Co., Ont. The line fence that divides the farms of these two men runs through a very low place that seems to have been designed by nature for scoring water. This piece of land, comprising about 12 acres on each side of the line fence, was selected by the Department of Agriculture for the location of their drainage demonstration plots.

A Timely Object Lesson.

The first plots to be inspected were on the farm of Beecher Matchett. After experiencing considerable difficulty in passing dry sod from the roadway to the field, I found the drained land to be in excellent tilth, with just enough moisture to provide ideal conditions for growth and with no standing water, except in one place, where it received the run-off from an adjoining field. The undrained plot, however, was in striking contrast to this one. Scarcely a foot of it but was water-logged, and a considerable portion of it was entirely under water. Both plots are sown to clover and grass, but while the drained land promises to give an excellent crop of hay, it will only be under very favorable circumstances for the balance of the season that a half crop will be secured from the undrained land. The plots on the farm of Sandy Matchett (not

Alexander, as he was careful to inform me) told a similar tale of the advantages of underdrainage. The drained part is under fall wheat this



How Water is Lost From Soil

SOILS lose water in only three ways: by drainage, evaporation, and "transpiration" by plants.

The food plants take from the soil passes into the roots dissolved in water. After this food material has been used by the plant, it becomes necessary to get rid of the excess water so more can be taken in. This is done through the leaves, from which the moisture is evaporated by the wind. This process is called "transpiration" and the plant can procure its food in no other way. If the plants are those of our crops, transpiration is to be encouraged and as much moisture as possible placed at the disposal of the plant for this purpose.

Evaporation, on the other hand, is always injurious and should be reduced as far as possible. Evaporation absorbs heat. It follows that the "drying out" of water from the soil uses up the heat which the soil should have and which it otherwise would have.

The third way in which water is lost from soil is by drainage. Drainage of water over the surface of the land is injurious because of the fact that it washes away soluble plant food and the finest and best particles of the soil.

Opposed to this is "Underdrainage," or the taking of water downward through the soil and out by underground channels. By this means, surface flow is prevented. It has been said "The process of underdrainage is a process of absorption and filtration as opposed to surface flow and evaporation. The completeness with which the latter is prevented and the former promoted is a measure of the completeness of the improvement."—E. H. Landels.

season, which at the time of my visit was just coming out in shot blade. It promises an excellent crop. "If this plot hadn't been drained," said Mr. Matchett, "we would never have been able to get the wheat sown last fall, and one thing is certain, it would not yet have been in a condition for sowing this spring but for the

drains." The undrained plot showed the condition this one would have been in if no provision had been made for carrying off the surplus water. It was sown to clover and timothy last year, and is now being used for pasture. The cows were literally wallowing knee-deep in mud at the time of my visit, and it is safe to say that if it had been left for spring seeding there would have been no crop produced on it this year. Needless to say, Mr. Matchett strongly favors drainage as a straight business proposition. The results, as seen on his own farm and on the farm of his brother, go to show that if nothing further happens to the crop, with the increased yield of this season alone, the original cost of a tile drain system could be largely defrayed.

In the Chesterville District.

In no part of the province are the advantages of drainage more strikingly shown than in the Chesterville district of Durham county. While on a recent trip to Eastern Ontario I stopped off at Chesterville for a few hours and paid a short visit to the Allison Stock Farm. On this farm the benefits of underdrainage are well illustrated. Mr. Allison stated that he has a traction ditcher of his own, and is proceeding from year to year with a drainage programme that is designed to eventually include the whole of his farm. This programme is not yet completed, and we had an excellent opportunity of studying the difference in the condition of drained and undrained fields that lie side by side and on the same level.

In looking over the farm, we first crossed a large pasture field which was undrained. The water level seemed to be within an inch of the surface in most places, and wherever there was a depression, however slight, it was filled to the brim with water. The ground was very soft and the cattle were cutting it up pretty badly. Every footprint they left became filled with water. Although the grass seemed to be flourishing fairly well, there was no clover to be seen. "Last year," said Mr. Allison, "there was a splendid stand of clover on this field, although it was only the first crop after seeding. This year we expected a still better stand, but as you see, it has entirely disappeared. That is what the spring rains have done for us."

We next passed by a field where two four-horse outfits were at work. Mr. Allison explained that this was one of the first pieces of undrained land that they had been able to do anything with. "As you see," he said, "it is not in the best condition for working, but we have simply got to get the seed in." The ground was rather too wet for seeding, and the cultivator teeth were clogging to some extent. It may not have been good farm practice, according to the text-books, to work the land until it became a little drier, but