Wasted Fertility

The Loss Not Always Realized

By School Teacher, York Co., Ont.

AMONG the books which we have in our village library is one entitled "The Fertility of the Land," by Roberts. While glancing through it the other day, I ran across an illustration that was adapted from a sketch drawn by a Japanese student of agriculture on an examination paper at Cornell University. The purpose of the drawing was to show how farm manure wastes when exposed to the elements. In the background was a barn with a huge manure pile beside it, and in the foreground a pond. Instead of a stream of water running down the hill and carrying the soluble constituents of the manure pile with it, a great number of small figures, like the Brownies, with which children are so familiar, were shown, carrying baskets and sacks of nitrogen, potash and phosphoric acid. These they were loading on a raft in a pond, ready to be taken away.

The sketch was a striking illustration of just what I had noticed the previous week while visiting the home of one of the scholars of my school. A large exposed manure pile stood in front of the barn. Down a ditch, which ran beside the lane, a small stream of brownish water flowed into a small creek a hundred yards away. That stream was carrying away the best part of the fertilizing material, the soluble part, from the manure pile. What was not soaking into the ground in the ditch, where it could never be utilized by the crops, was being carried to the creek where it was lost forever. Every particle of that waste represented lost fertility which was badly needed on the fields, and was, therefore, just so much lost money. I imagine that if this farmer saw ten dollar gold pieces rolling down the ditch and out of sight he would neither eat nor sleep until the losses were remedied, or even if he had seen small figures carrying away sacks of fertilizer labelled "nitrogen," "potash," or "phosphoric acid," fertilizers for which he sees his neighbors paying high prices, he would have been no less concerned. Had the manure of the pile been distributed on the land last winter, or early in the summer, all this fertility would have been absorbed into the soil long ago and would now be helping to bring this year's crop along.

Two Simple Concrete Devices

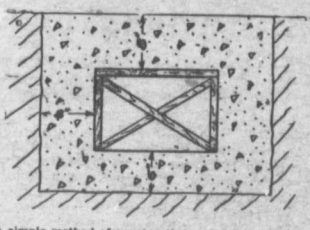
A Culvert and a Feeding Trough

CULVERTS on the farm might be likened to the old "Forty-niner's" comment on the practice of carrying a pistol. As he put it, a gun was something one might not need for a long time, "but when you do need it you need it mighty bad." Every farmer will recognize the application. Perched upon a loaded wagon he has driven out of a field into his lane or the public road and dreaded crossing the intervening ditch that marked the boundary. The down-pitch and jolt of the wagon, then the strenuous pull and wrench required to get it up the other side of the ditch spelled wear and tear in large letters, with too often things actually broken or part of the load dumped off. Again, there is the place in the lane that every torrential rain washes into a gully, or the muddy ditch in close proximity to the house or barn.

The farmer is foolish to submit to all this annoyance, inconvenience and exasperation when it is so easy to establish culverts that will remedy the situation effectually and permanently. With little effort and at small expense he can put down imperishable concrete culverts.

Concrete culverts are built several ways. The purpose here is not to consider the more complicated and expensive types, but culverts of the most economical construction, such as will not only take care of water, but serve as little bridges over ditches or depressions in a road or driveway.

For example, having determined the required size of the culvert and having made the proper excavation, place in the latter 6 inches of concrete consisting of one part Portland cement, two parts sand and four parts stone, the stone graded from one-quarter inch to one inch in size. If crushed stone is not available use one part Portland cement and five parts of gravel, if the gravel is clean and well graded. After placing a six-inch bed of concrete in the bottom of the excavation erect board forms as shown in the accompanying drawing, bracing them at each end as indicated. The width and depth of the excava-



A simple method of constructing a small concrete culvert.

tion should be such as to allow an eight-inch concrete covering at the top and sides of the form. After the concrete has hardened the inside braces are knocked away and the side forms allowed to collapse, which will also release the upper or top board. This will give a flat concrete arch of great strength and the method of constructing it is as simple and economical as could well be devised. Where a very small drain is required and the farmer happens to have some terra cotta pipe on hand, he could resort to the same method of building a culvert with a round instead of square or rectangular opening, allowing the pipe to remain.

By remembering that a barrel of cement will make about 25 cubic feet of concrete of the proportions given above, it will be easy to calculate approximately the amount of cement required for a culvert of given dimensions.

Diagram of Concrete Feeding Trough Shewing Construction of Moulds.

A Cement Trough.

The common watering or feeding trough has undergone considerable evolution since the country was first settled. Our grandfathers had at their disposal plenty of timber, but very little cash. When they wanted a trough for any purpose they simply hollowed out a log on one side, using only an axe, or if they were lucky in having a neighbor who was a timber framer, and therefore the possessor of an adz, they might borrow that handy implement. These old-fashioned troughs are still to be seen in some parts, but are usually far gone in decay. Later, troughs were made of two-inch planking, held together by spikes and clamps. Many of these are still used, but there is a tendency to swing over to the use of cement or even of iron. One of the chief advantages of these materials is that they are more sanitary than wood.

When a trough is more or less stationary cement concrete is a cheap and efficient material from which to make it. The diagram shows how to construct a form in which to make a neat trough of this kind. But little further explanation is necessary. It will be noticed that the trough is upside down when setting in the moulds to harden. The end of the inside mould is cut off at the same angle as the slope of the sides and a piece of lumber is nailed on. The bolts of which the heads are imbedded in the concrete are spaced to take the partitions, which may be as far apart as is deemed necessary. A coating of cement, mixed with fine sand, should be troweled on the inside of the trough to make it waterproof.

In making devices of cement concrete the farmer should be careful to have clean sand and well graded aggregates and be patient enough to allow the concrete to harden thoroughly, say for a period of two weeks. More failures are caused by the use of dirty sand, unsuitable aggregates, and undue haste in the removal of forms and premature use of construction than are caused by defective cement.

Fighting the Weeds

Their Habits Must Be Known

THE five weeds occurring most frequently on the 400 farms visited by the Conservation Commission in 1915 were Canada thistle, couch grass, wild mustard, ragweed and sow thistle. One hundred farms were visited in each of four counties, Dundas, Carleton, Waterloo and Northumberland. In many instances, the weeds are very bad and increasing at an alarming rate. In Dundas, 96 per cent. of the farmers visited report wild mustard; 88 per cent. report sow thistle, with 26 per cent. reporting it increasing. In Carleton, 89 per cent. report couch grass, 77 per cent. report sow thistle, with 22 per cent. reporting it increasing.

To succeed in eradicating weeds one must have a knowledge of two important points; how long the plant lives, and how it reproduces and spreads. Regarding duration of life there are three classes of plants:—Annuals, biennials, perennials. Annuals come up from seed, blossom, flowers and seeds and die, all within one year. Biennials grow from seed and produce only leaves during the first year. The roots and sometimes the leaves live through the winter. The second year a flower stalk comes up and seeds are produced, and the plant dies. Perennials are those whose roots ordinarily live on year after year. The plant may or may not produce seed every year; according to conditions.

Practically all annuals reproduce by seeds only. Biennials, also, except during the winter when the roots are in the ground, reproduce by seed. Perennials propagate by means of the roots or by roots and seed.

Means of Control.

Annuals and biennials are controlled by cutting or pulling, thorough tillage of cultivated crops, rotation of crops, or spraying with chemicals. Perennials are controlled by summer fallowing, partial summer fallowing and smother cropping, thorough cultivation with crop, smothering with such materials as tar-paper, or by the application of salt brine or gasolene. Farmers, townspeople and municipal authorities alike should enlist today and join whole-heartedly in the fight against our common enemy the foul weed.—F. C. N., in Conservation.