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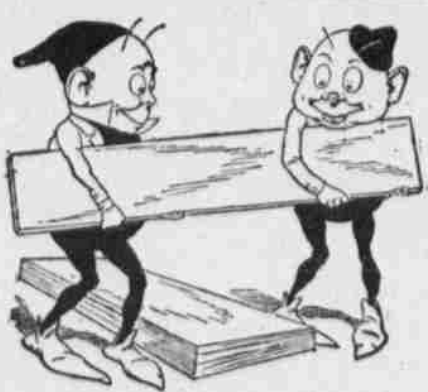
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Making Money On the Farm

I.—Drainage

By C. V. GREGORY.

Agricultural Division, Iowa State College

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C. V. GREGORY.

Author of "Home Course in Modern Agriculture"

In order to make money on the farm it is first necessary to get the land in shape to respond liberally to the work put upon it. One of the first and most important steps in getting it in such condition is to drain it thoroughly. There are two general types of drains—the drains and open ditches.

About the only place where an open ditch can be used to advantage is in draining large sections of the country where natural drainage is insufficient to carry off the surface water or to provide an outlet for tile. Such a ditch is really an artificial river. Its large size prevents it from becoming easily clogged. It should be made deep enough to provide a good outlet for the systems from the farms tributary to it. The sides should have a slope of at least one to one—run back one foot for every foot of rise.

The Use of Tile.

The major portion of the drainage, however, must be done with tile. In starting out to tile a farm it pays to go at it systematically. Few farmers are able to tile their whole farms at once, but by planning the whole system before any work is done and then putting in as many rods as possible each year the farm will in the end be thoroughly drained at much less expense than if the work was gone at in a hit or miss fashion.

The proposed lines of tile should be laid off by a good engineer. He has the tools and ability to do it properly, and a little money spent in this way will be made up many times over in the added efficiency of the system.

The first money that is spent for tile should be put where it will yield the quickest returns. On almost every farm there are sloughs and draws that are too wet to work long after the rest of the field is dry. The loss is not so much from the land that is taken up by these sloughs, though that often amounts to considerable, as to the trouble and loss of time in working around them. A line of tile can be run up to such a place to take out the water and laterals put in later to drain the surrounding ground more thoroughly.

Often after the slough is drained there will be a strip of corn over the tile that will be the best in the field, while out a little farther the corn will be small and yellow. The width of this strip of corn is a very good indication of the distance apart that the drains should be placed. The ground over the tile is warmer and drier in the spring than the other, and consequently the corn gets a better start. Through the summer, when there is no water in the tile, air is flowing down through them. This pulls air down through the soil, making root growth more rapid and the plants more vigorous. A deep root system means a larger yield. For these reasons all low, flat lands should be thoroughly underlaid with rows of tile, even though the surface water never stands on them. A map showing the exact location of the drains should be kept so that they can be readily found when it is desired to add laterals to the system.

Planning the Drainage System.

In planning a drainage system there are three especially important considerations—the depth and size of the tile and the distance apart of the drains. More tile drains are put in too shallow than too deep. In most soils four feet is about the right depth. In

on a sandy soil will draw seventy-five feet on either side, while in clay soil their effect will not be felt a third as far. As already stated, the width of the strip of good corn or other grain over a drain is a good indication of the "pulling power" of the drain. Where a drainage system is being put in a little at a time the laterals can be put in from 75 to 200 feet apart at first, depending on the soil, and others put in between later if experience shows them to be necessary.

The Outlet.

One of the most important parts of the drainage system is the outlet. If the drain empties into a ditch or stream a stone bulwark should be built up to keep the end tile from being washed away. The drain should enter the stream above the level of the water if possible. When it enters below the force of the current is checked, and if the water is carrying much silt some of it will be deposited in the



FIG. 11—POOR WAY TO LAY TILE.

tile. It is a good plan to use sewer pipe for a few feet back from the outlet, as it is not so easily displaced by freezing.

Many drains are built with an outlet in a box at the side of the road or next to a neighbor's fence. Such an outlet is not very satisfactory, but sometimes it is the best that can be provided. The box should be well built to keep out rubbish. The mouth of the tile in this as well as in other forms of outlets should be covered to keep out small animals during dry weather. The bottom of the box should be at least a foot below the tile. The silt that settles here should be cleaned out occasionally. A much better plan than the use of a tile box is to cooperate with the road authorities or with the neighbors and extend the line of tile to some permanent outlet.

Laying the Tile.

It rarely pays a farmer to lay his own tile, but he should keep close watch of the men whom he hires to do the work. A little carelessness in laying the tile may make the drainage system practically worthless. If at any place the tile dips an inch below the grade line, that inch will fill up with silt, and the capacity of the whole system will be reduced that much. The old saying that a chain is no stronger than its weakest link applies with especial force to a tile drain. No man can lay tile to grade accurately by eye, even if there is water running in the ditch at the time. Remember that it is your money that is being put in for the drain and that it is your privilege to have it put in as you want it.

The only way to get the tile laid exactly to grade is to use targets. When an engineer lays out a line of the tile he sets a row of grade stakes, each one marked with the depth the ditch is to be at that point. When the ditch is down nearly to the required point targets are set up at these grade stakes. A target consists of an upright stick on each side of the ditch with a crossbar clamped to it. These crossbars should be adjusted so that they are level and just seven feet above the grade line. For instance, if the cut marked on the grade stake is four feet the crossbar should be three feet above the stake. After a number of these targets have been set a string is stretched across the tops of them. Then a measuring stick seven feet long will just reach from the string to the correct grade line. With one man to hold the measuring stick and another to scrape out the bottom of the ditch, it can be dug to grade very accurately.

Of course both digging the ditch and laying the tile should begin at the outlet. Don't let the men stand on the bank and lay the tile with a hook. Make them get down into the ditch and put them in by hand, standing on those already laid to hold them in place. By handling each tile any cracked or imperfect ones can be discovered and thrown out. After the tile are laid a little dirt should be scraped from the side of the ditch to hold them in place. As soon as the whole line is in no time should be lost in covering the ditch.

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