Agriculture.

Construction of Tile Drains—No. 4.

BY PROF. MANLY MILES.

As in this series of short articles on laying tile drains, it is proposed to direct attention only to those points in construction that are the most common causes of failures; we now notice the results of leaving *open joints* to allow the water to enter the tile freely.

This is too often a cause of obstruction, the silt or earth washing in at these openings and filling the tiles so that they become useless as drains.

If those who have fears that the water will not find its way into the tiles when the joints are laid as close as it is possible to make them, we will for a moment consider the matter from a different standpoint, their difficulties will be seen to be imaginary.

Suppose for illustration that the tiles are laid for carrying the water of a spring a considerable distance; they will say at once that the joints cannot be made tight enough to retain the water unless they are covered with a layer of cement.

In looking upon the tile as a conduit to convey the water through the soil they cannot fail to see that a water tight joint cannot be made by merely placing the ends of the tile in contact. They know that such a pipe for conveying water will leak. Now they must as readily perceive that it makes no difference whether the water is outside or inside of the pipes, so far as leakage through the joints is concerned.

A pipe, with joints every foot, that will allow the water conveyed in it to leak out, will certainly allow the water on the outside in the soil, when it rises above the bottom of the tile, to lead into it and run off in the drain.

If tiles are laid with their ends in as close contact as the roughness of the earthenware surface will permit, the soil will not wash in to form an obstruction, but the water will leak in rapidly at every joint, and as they are but one foot apart the leakage in but a few rods in length of the drain will be sufficient to fill it to its full capacity.

Even when the joints are made as tight as they can be by placing the ends of the tile in actual contact, it is but to take the additional precaution of covering them with a thin firm sod, the grass side being placed in contact with the tile.

Sometimes inexperienced persons place a layer of straw or gravel immediately above the tiles to furnish a porous stratum, through which the water can find its way to the top of the tiles, where they suppose it should be admitted to the drain. This is not only objectionable, from its being a needless expenditure of time and money, but it may also prove a source of obstruction, from the washing of chanels that bring loose fine earth in contact with the tiles where it is liable to find admission to the drain.

Water should never be allowed to enter the drain at the top on account of the fine earth it brings with it to the drains.

In all well-constructed drains the water enters at bottom and sides.

If holes are dug in soils that need draining the water will be seen to stand in them at a certain level. The surface of this water in the soil is called, for convenience, the water-table, and the object of drainage is to lower it and keep it below the stratum of soil in which the roots of plants feed.

When tiles are laid below the level of the water-table, the water leaks into them until the water-table is brought down to the bottom of the tiles, when they stop running. When a rain occurs the water soaks down through the porous soil and raises the level of the water-table, and the leakage into the tiles at the bottom takes place and continues until the level of the water is again brought down to the bottom of the tiles. Where springs occur to keep up a constant discharge from the drain the level of the water-table in the soil remains as high as the surface of the running water in the tiles, and as the water in the drain runs off and is discharged at the outlet, new supplies are received by the leakage through the joints of the tiles, at or below the surface of the water running in them.

From this it will be seen that water only enters the tiles when the water-table is raised high enough to bring the drain within its level, and that it is necessary to provide for the entrance of water at the top of the tiles when the silt is liable to be washed in with it.

In filling in the trench after the tiles are laid, the earth should be well packed to prevent the water from soaking through to the tiles, and the earth at the surface should be well rounded up on the line of the drain so that any storm water may be turned to its sides to soak down through the soil that has not been disturbed in making the drain.

Saving Seed Corn.

We have sometimes had no little difficulty procuring seed corn that would germinate. Some seasons the corn is not sufficiently ripened before the frost. On this subject the Cincinnati *Grange Bulletin* tells why these failures occur, and adds a few seasonable hints on the saving of tomato seed.

The perfecting of seed is the whole end and aim of all annual plants, the whole energies of the plant from germination of the seed down to the frost that kills the plant and stops the flow of sap, are absolutely required to make perfect seed.

The immature sap of a young plant never could produce a mature seed; it requires all the whole volume from infancy to maturity, the weak and the strong life blood of the plant, to give the seed its full power of transmission. Especially it is necessary that the last remaining flow of sap from the stalk, matured by age, the season and the approach of winter should enter the seed. Hence to deprive seed of this final act, is to weaken it; it may have vitality enough without it to grow and produce other seed, but it is itself immature, and must produce immature seed.

To gather corn in the glazed state, and hang it up in the shade, is to deprive it of all the mature sap of the plant, and also of the ripening influence of the sun.

Nature never ripens seed in that manner. She gives it every chance, every influence, every particle of nourishment from the plant itself, from the sun's rays, the night's dews and the perfecting influence of the waning season. This much for corn especially, but also for all others.

Tomato seeds require a little different management, because they are more tender. In this case leave the earliest, finest, smoothest, largest fruit on the vines till a slight frost admonishes us of winter's approach. Then gather them, lay them on a board in the sun during the day, but in the house at night, for three or four days, then cut the tomato in half across the stem way, scoop out the core, seeds and all, throw them into a bucket till they sour and ferment, wash out the seeds, dry perfectly in the sun, not in the oven, and put away in a dry place.

Chess and Wheat.

The "scientific opinion" on the chess question has never been changed, altered or amended. It has been and is that there is no proof whatever that chess has changed into wheat, at any time in the past or the present. More than forty years ago this question was brought up in New York with exactly the same statements as Mr. Wood recites to-day as the alleged facts, and they were exploded. It is a fact that some new pieces of land generally liable to be wet in rainy seasons, and to hold water during the fall and winter, have been known to yield a growth of chess and only a few stems of wheat, and it *seemed* as if the wheat had turned to chess; but the wheat had been killed out and the chess, which is a well-known weed, took possession of the ground. That was all there was of it. We have had many times (once not later than last year), presented to us a head of wheat with a cluster of chess growing apparently out of the head. Once, some eighteen years ago, we sent one of these heads to Dr. Gray, the distinguished Botanist of Harvard University, Cambridge, Mass., and he returned it to us, showing that the elastic slender stem of the chess had been broken off the chess plant by the upward growth of the head of wheat, and it was so intertwined that the deception was perfect. Last year a head of wheat with a stem of chess interwoven was presented to us by a farmer of Macomb County as a proof that chess grew on the head of wheat. We made him sit down and right before his eyes we stripped the head of wheat of its grains, one by one, and then we came to the slender stem of the chess or cheat, and showed him just how it had cheated him. A series of experiments were tried with wheat; tramped and pounded, and half drowned in water, some years ago; but there never was any chess grown from wheat where there was none in the wheat seed. We have frequently been shown seed that was called clear and free from chess, but we almost invariably found chess seed in the sample. We know that no farmer has yet succeeded in gathering a crop of chess from good wheat land, when the seed was not sown. On low-laying lots of new land, where the wheat plant is killed by the water, the chess plant comes up so like wheat that it is mistaken for wheat in the fall, when in reality the plant that is growing is chess. In the spring it is recognised, and then we are told the wheat had changed. We might as well be told that a good game fowl had been changed to an owl in the process of incubation. The change would be about as great in the animal kingdom as the change from wheat to chess in the vegetable. No sir, plants continue to yield seed after their kind just the same now as they did in the time of Adam.—*Mich. Farmer.*

Notes from Kentucky—The Wheat Crop.

The want of winter freezes in January and Feburary is now telling upon the corn crop. The soil has been cloddy and badly pulverized during the entire season, and in some sections of the country this difficulty has been increased by plowing the land when too wet for cultivation. This has caused the soil to become baked and hard.

Wheat has generally been threshed, and much of the crop has been sold and delivered. In all the counties bordering on the Tennessee line and extending north to the Lebanon branch of the L. and N. Railroad, which embrace the heaviest wheat-growing portion of the State, the yield has been very poor in many of the best counties, not exceeding eight bushels to the acre. North of the L. Railroad the yield is much better, and in the "Blue-glass counties proper" is 15, averaging in some counties over 20 bushels to the acre. Where the crop was good, the grain is of excellent quality, but where the crop was injured by smut and rust the grain is quite faulty and shrivelled. The cause of this failure in the wheat crop in the western and southern counties is doubtless owing to the want of winter freezes to disintergrate the soil and to prepare the fixed elements of plant food, so that they might be easily dissolved by the spring rains and assimilated through the digestive organs of the plants. Wherever bone-dust, salt, and nitrogenous fertilizers were used, the wheat got the requisite amount of nourishment and made a good heavy crop. The reason that the Blue-glass wheat excelled is because the silurian of blue limestone rocks underlying the soil are more easily dissoluble on account of their shelly nature, and gave out their elements freely to the action of the carbonic acid of the rain water.

Experiments were recently made in one of the Eastern States by which it was ascertained that, on an average, one beetle will eat an inch square of potato leaves in thirty hours, the maximum rate being ten hours and the minimum thirty-seven hours. One beetle is able to defoliate entirely one plant of potatoes during its beetle life.

EXTRAORDINARY WHEAT.—A farmer in Monterey county, Cal., has a variety of bearded wheat, of which he harvested two years ago one hundred sacks from one sack sown, and his crop this year seems as good. The straw is over seven feet high, and a large man in it can tie the heads together above his head. It is so thick that one person can not see another four feet away. The variety is known as the "Snowflake." So it is said.