

father used for finding the capacity, and which I have always found satisfactory, was to multiply the diameter of the tile by itself, and divide the product by four. The result is the number of acres whose waters can be carried by that size of tile. If you have a good fall, one may safely divide by three, instead of by four. As this rule is only a rough guide, one must, of course, use judgment in applying it. For laterals, the tile may be small if care is taken in laying them. Where the bottom of the drain is solid and the grading perfect, a two and a half-inch tile has been used, and given perfect satisfaction; but in soft land it is nothing unusual to have to use a four-inch pipe to permit a slight settling out of line, without closing the drain.

The work of underdraining is still done chiefly by hand. Where the ground is flat and free from stones, machines for the purpose can be had, where drainage is done on an extensive scale, but they are not profitable on the majority of farms needing drainage. The correct tools to be used are the long-handled shovel, the tiling spades, the pick, and the grader. The expense of the digging depends not only upon the character and condition of the soil, but also upon the class of workmen employed.

The chief point to consider is to have each tile on the grade, neither above it nor below it. You can easily do this when the levelling has been done and one knows the depth of the cut at each hundred-foot mark. Place two stakes at each point, one on each side of your proposed drain. Draw a string across from the top of one stake to the top of the other, five and a half feet above the proposed grade. Do this at each point, and the strings will be in line, all being five and a half feet above the grade. Take a staff five and a half feet long, and as the digging proceeds test each foot of the completed trench. When one end of the staff is on the grade, the other end is in a line with the strings; consequently, the least inaccuracy in the grading is easily seen.

Examine each tile, for one bad tile may destroy the value of the drain. I always try to get them hard-burned, and they should always have a clear ring. For best satisfaction, lay the tile by hand, and turn it so that the top joins closely, as this insures the water rising in the pipe, not falling into it. Make the first filling of the trench by spading down some fine soil from the sides. This light covering prevents any displacement by heavy clods or pieces of sod when the remainder of the filling is done with the plow.

Carefulness is the keynote to successful underdrainage. Begin with the right system. Have the grade right. See that the main has sufficient capacity. Use only good tile. And make the joints tight to keep the silt from entering. By following this system, I know men, neighbors of my own, who have turned the veriest swamp-land into the finest farms in the country.

Carleton Co., Ont.

J. S.

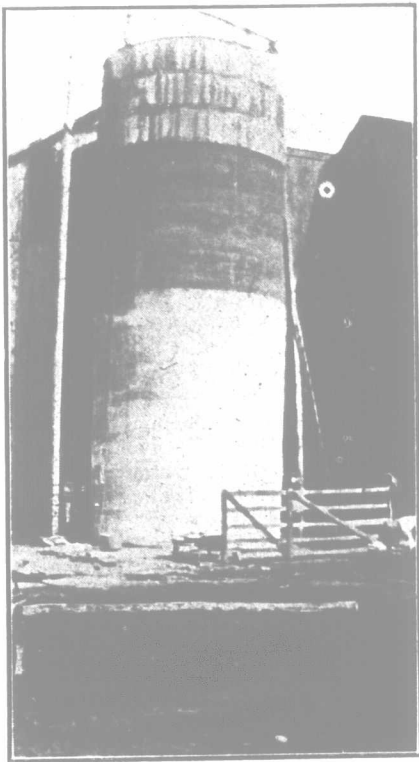
[Note.—We agree with J. S. that underdrainage is one of the most important spring operations on many farms, and the article is very timely, and quite practical. There are a few statements, however which, although apparently made from experience, are not wholly approved by our present-day drainage experts. The method of finding the capacity of the main is not one that could be followed in all cases. While it might answer in cases where small mains are required, there is no allowance made for the diminished friction and relatively-reduced danger of settling in the larger tile, which are very considerable considerations; and, according to this method, larger tile than are absolutely necessary might be used in many cases. We also think that, under no consideration should smaller than three-inch tile be used, although, under special conditions, 2½-inch pipes may have proved satisfactory. There is more danger of clogging, and any unevenness in laying would cause more trouble than in larger tile. There are several ditching machines in operation in Canada, and they are giving good satisfaction. A special machine is constructed for stony land, and, while the operation is more easily accomplished in level land free from stones, most any kind of soil can be drained by the use of the outfit, although, as stated in the article, on very stony land hand digging would likely be most profitable.—Editor.]

Silo with Seven-inch Wall.

Editor "The Farmer's Advocate":

The accompanying illustration is a cement silo built in their neighborhood last summer. It differs somewhat from the one built at Weldwood. I will try to indicate the points of difference. It is not a battered wall, but consists of a seven-inch wall from the ground up, a distance of 35 feet. It is also a foot and a half below ground, with same thickness of wall. It is a 13-foot silo, and wall mixed 1 to 8 with a cylindrical mixer, operated by one horse on the horse-power shown. The water was provided by the water tank shown in the illustration. Several loads of stone were put into the wall, and every two feet was laid a single strand of No. 9 wire. Most of the cement

was mixed dry enough to require tamping, as this was the usual practice of the contractor, but the owner is now convinced that it is better mixed sloppy, like mortar, and not tamped. No scaffolding was used on the outside, but a swinging scaffold was used inside, attached to two wire cables, which worked through pulleys on the horizontal beam, supported by two uprights, and each connected with a powerful "drum" supplied with ratchets and dogs, and fastened near the base of the said uprights. This scaffold occupied the whole inner space of the silo, and afforded a very convenient platform on which to work. The concrete and stones were elevated by a horse and rope, attached to a barrow or large pail. This rope works through a pulley attached to an iron crane fastened near the top of one of the uprights, and swings to inside or outside of the silo, as required. This is much handier than the scaffolding. The inner rings were raised by hand, and the outer ones by ropes and drums, like the scaffold, and operated from the ground. The swinging scaffold proved very convenient for applying the cement wash inside. Nothing was done to the outside, and no roof was put on. Boards were laid across the top. The uprights, with the horizontal beam and crane, were securely fastened together on the ground, and raised by



A Perth Co. Silo.

means of the drums fastened to beams in the barn. The usual watering of the wall was observed, and the roof-plate bolts put in. Also a hook near top of wall, on which to hang a pulley for raising blower pipe. This is very convenient.

The photo was taken just after raising the curbs. As can be seen, the concrete in last one was not quite dry. The silo is connected to barn by two partitions of rough lumber, thus forming a wide chute. The doors are 18 by 33 inches, and four feet apart, and a wagon tire is embedded in the concrete over each one. Some of the wires embedded were doubled by twisting, but soon abandoned as unnecessary. The gravel was drawn two miles. The contractor charged \$5 per day, and was supplied with two assistants and horses, and, by faithful work, built the 35 feet in eight days. A common contract price around here is \$2.00 per foot for 12-foot silo. Following is approximate cost:

40 barrels cement, at \$1.75.....	\$ 70.00
30 loads of gravel, at 25 cents	8.00
2 loads stone, at 25 cents	.50
No. 9 wire	4.00
5 wagon tires	1.00
5 doors	1.25
	\$ 84.75
Labor:	
Contractor	\$ 36.00
Two men, 8 days, at \$2	32.00
One man, 8 days, at \$1	8.00
Same, moving apparatus, 2 days	10.00
Team, moving apparatus	3.50
Horse for hoisting	8.00
Board of contractor	4.00
Digging trench and building foundation wall	3.00
	\$104.50

Perth Co., Ont.

J. H. BURNS.

Some Points in Oat Growing.

From experiments carried on at the Iowa State College of Agriculture with different methods of growing and handling seed oats, and reported in Bulletin 128, we glean some valuable information.

Taken as a whole, imported seed did not turn out any better than the average home-grown seed.

The figures seem to show that seed oats become better adapted to a given environment by being grown under the conditions which the environment affects. In the 1910 test, only four of the nineteen new importations yielded as well as the same varieties that had been acclimated for one and two years. The loss occasioned by importation seems to be in direct proportion to the amount of change of environment occasioned by their travel.

The quality of seed used does not seem to be as important a factor as acclimatization. This point is noticeable within certain limits. Seed seriously injured by lack of acclimatization requires at least one more season to become even normal.

In order to give a maximum crop of any grain, a field must present an even stand of uniform plants. Fields that look ragged sometimes yield more than the one across the fence that has been properly tended, but this is no argument that the piece in question could not have been improved by the adequate treatment.

There are four factors that go to produce an even crop—uniform land, uniform tillage, uniform seed, and uniform distribution of seed.

The depth to which oat ground should be tilled varies with the soil and season. Corn stubble will usually produce a fair crop if prepared well to a depth of two to two and one-half inches. The best crops, however, have been raised upon land tilled to a depth of four inches. The seed should not be put in more than one inch, below the surface.

Fanning seed once or twice improves the crop. Well-fanned oats will usually give a germination test above 90 per cent., but if they have at any time heated in the bin, they should be tested for vitality.

One thing is certain, that drilling is never detrimental unless the seed is put in too deep. This is a matter that depends upon the judgment of the farmer. It is not advisable to use a drill in the mud. Taking everything into consideration, it is safe to say that every farmer should own a drill, and should use it whenever the land is dry enough to permit.

RATE OF SEEDING.

Closely allied with the uniformity of distribution and depth of seeding is the thickness of seeding. In oats, this is almost entirely governed by the amount of seed sown. For the past six years this Station has conducted experiments to ascertain the optimum rate. The test plots have always been sown with a disk drill, using from four to twelve pecks per acre.

From the tests in 1906 and 1907 it became evident that in some seasons three bushels were insufficient, and thus higher rates were sown, up to 4½ bushels. It was also evident that in no case would less than two bushels be sufficient, so the lesser plots were discontinued.

In further tests, with one early and one medium variety, it was found that four and four and one-half bushels per acre gave best results. This indicates that the average farmer is planting too little seed.

SHOCKING

Opinions differ regarding the form of shock which it is best to use. This will vary with the ripeness of the bundles. Round shocks should be of medium size, open enough at the base so that they will dry quickly, and capped so as to expose the least possible amount of the heads to the sun and dew. The color of the grain depends largely upon these two points in shocking.

SHOCK THRESHING.

Shock threshing is a pernicious practice. After a man has gone to the trouble to raise and harvest a crop of oats, there is no excuse for his damaging their palatability by putting them "through the sweat" in the bin. Oats can be stacked and threshed for practically the same money as when they are hauled directly to the machine. When oats are "sweat out" in the stack, there is much more air around the grain, and it comes out bright in color and crisp in texture. There is usually at least one grade difference between stacked and shock-threshed oats.

Do not be afraid of a little wind when threshing; the light, half-filled berries are worth just as much in the straw pile as in the bin, in addition to the fact that they are eliminated from the threshing bill.