

them. The fall need not be uniform, but uniformity should be aimed at to a reasonable degree, and in this way a good fall for drainage will be assured.

A part of drainage is the crowning of the road. The roadway should be well rounded, so that the water will run freely to the side drains, and will not lie in the wheel tracks. On country roads, a fall of an inch to the foot from center to side is little enough, and more on a newly-graded road is desirable. The constant tendency of roads is to settle and spread to a flat surface. The roads with a high crown are the most durable.

But surface drainage is not all. Tile drainage is an absolute necessity to most roads to protect them during the spring break-up, and in mild winters of alternate freezing and thawing. Tile underdrains lower the water-line underneath the roads. The effect of tile on a road is similar to its effect on farm lands, in causing them to dry quickly in the spring. By keeping the water out of the body of the road by this means, the bad effect of frost is reduced to a minimum, and boggy places, quagmires and pitch-holes are done away with. A tile drain along the roadway under the open drain, three feet below the surface, is the best location, and one such drain will do nearly all that tile drainage can accomplish.

Municipalities in which statute labor is depended on to maintain the roads will this year be at a disadvantage in making the necessary repairs. Statute labor will not be available before the month of June, whereas repair should be commenced as soon as the frost is out of the roads. Earth roads should be levelled off with a scraper; gravel and broken-stone roads should have the edges of metal drawn into the wheel tracks with a grader, and new material added wherever needed to restore the crown. If this work is done early in the season, while the earth is moist, it will pack down quickly, and the roads will be good all summer. But if left until the earth becomes baked and hardened, rough roads will be the result for the greater part of the summer.

It is to be hoped the coming season will be an energetic one so far as road improvement is concerned. Statute labor has, in the past, served a good purpose, but everywhere there is evidence that it should retire in favor of a plan better adapted to present conditions. It is not enough, however, to abolish statute labor. In its place there must be put a system that will be operated with energy and intelligence. Whatever the details of the new system may be, they should be such as will enable the township to profit by the growing experience of those in charge of the work. The number of road commissioners should be reduced to the least possible number, and these kept permanently in office. The idea that "anyone can build a road," is a fallacy that has cost the Province of Ontario hundred of thousands of dollars—and still we have bad roads. Anyone and everyone have been making the roads of Ontario for a century. The present condition of the roads is ample proof that the work should be put into new hands. One efficient commissioner can readily take charge of from 50 to 150 miles of road, appointing foremen as required. This is the only way to secure uniformity, economy, and the efficient management of all details.

A. W. CAMPBELL,
Com. of Highways.

Sowing Clover on Fall Wheat.

Editor "The Farmer's Advocate":

Seeing recently a letter in your valuable paper about sowing clover too early, written by John Lawson, Middlesex Co., Ont., and your editorial note asking others to give us the benefit of their observations on this point, I may say that, having had a good deal of experience in sowing clover seed on fall wheat in the spring, I must agree that Mr. Lawson is correct. I have sown in March when a covering of snow was on the ground, have sown in mud, and have sown as late as the 20th of April, and failed to get a catch. Some years ago I had a conversation with an old settler in this county who told me to not sow my clover seed on fall wheat till the last week of April or the first week of May, whether the season was early or late, nor how large a top the wheat had. And then, when I sowed the seed, to put a heavy set of harrows on the field, and drive my horses at a good sharp gait, giving it one stroke of the harrows, and if the ground was hard, two strokes. This plan I adopted some years ago, and it has been successful with me ever since. Last year I seeded a field of wheat in this manner on the last days of April, when the ground was almost fully covered with wheat. And when the big iron harrows drawn by three horses went over that field, one would really think the wheat was ruined. I rolled it right after the harrowing. The average yield per acre was 44 bushels, and a better catch of clover I never saw grow. In September one could have mowed it for hay. I have now given you my theory and practice.

W. H. O'BRIEN.

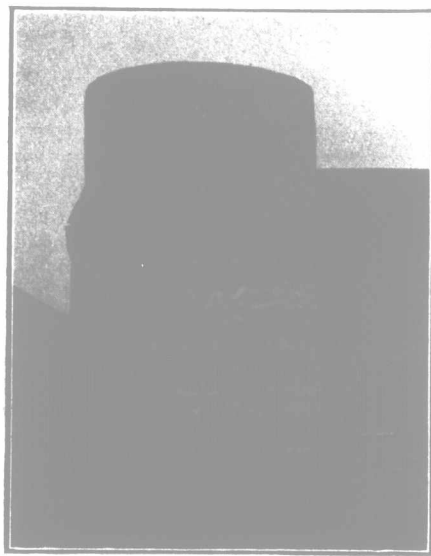
Northumberland Co., Ont.

How a Round Cement Silo was Built.

Editor "The Farmer's Advocate":

The accompanying half-tone shows our concrete silo, 31 feet high and 14 feet in diameter, costing \$140, not including the expense of hauling gravel and cement. In this case it required 28 loads of gravel and 27½ barrels of cement. Portland cement was used, being mixed with the gravel in the proportion of 1 of cement to 12 of gravel for the lower 10 feet of the silo, and in the proportion of 1 of cement to 10 of gravel for the remainder. The proportion of gravel was lessened slightly as the silo neared completion, and the top six inches was made in the proportion of 1 of cement to 2 of fine gravel. In this way a very hard top was obtained, to withstand the action of frost, etc. The reason for making the concrete stronger (to contain more cement) as we came nearer the top, was that the wall decreased in thickness all the way up. The base was laid 12 inches in thickness, which brought the wall to the ground line, a height of 2½ feet. It was then narrowed to 10 inches. Steel rings were used—four in number, two for inside of wall, and two for the outside. The inside rings remained the same size all the way up. In that way the inside of the wall was made perpendicular; while the outside rings were made so that they could be made smaller at the top circumference, and in that way the wall became less in size all the way up, until, at the top, it measures 6½ inches in thickness.

The reason for having two sets of rings was to enable the filling of two rings a day (5 feet), and also to protect the green wall when the rings



H. S. McDiarmid's Round Cement Silo.

were being raised. When one set of rings was filled, the lower set were placed directly on top of the filled set and were filled, then the lower set was placed again on top. This was repeated until the silo was completed. Wooden spread sticks were used, made the length of the thickness of the wall, being made shorter each raise of the rings. It is necessary to have good substantial scaffolding right around the outside of silo site. In our case five poles were used, which, when put in the ground, stretched higher up than the top of the silo. To two of the tallest of these poles, and at a convenient place, was spiked a plank, about 8 or 10 feet higher up than the top of silo. To the middle of this plank was fastened a hay-fork pulley, and, by means of a hay-fork rope, the wheelbarrow loads of concrete were lifted the required height by a horse. Two wheelbarrows were used, so as to keep operations going, the one being filled below while the other was being emptied on the scaffold. The concrete was mixed as dry as possible. In every 2½ feet of wall above ground were placed three strands of No. 6 straight wire, or one every 10 inches. The ends of each strand were brought together, hooked, and doubled back in the concrete. Care was always taken to keep these strands in the center of the wall. There were three windows or openings placed in the side of silo next the barn, where the silage is taken out. These windows are 2 feet wide by 3 feet high, and, if rightly placed, we consider are sufficient for a 31-foot silo. On each side of these openings in the wall we placed iron rods, projecting one foot above and one foot below the opening. To these rods we fastened the wire, and doubled them back in the concrete. These rods and wires, we believe, are a great source of strength to our silo wall, to resist the bursting pressure to which it is

subjected. When a silo built in this way is complete, it should be well plastered on the inside, at least, and preferably on both sides, with fine sand and cement, 2 to 1. A drain should be put in to run under the floor to the center of the silo. The floor should be made of concrete, two inches being thick enough, and should slant to the drain in the center. We have no roof on our silo, although we have placed eight bolts in the top surface of the wall in case we should decide to put on a roof. This winter a roof has not been needed, but then there has been very little snow to trouble this winter.

To those intending to build silos we would say, build a concrete one, locate it in a place close to your feed-room, so that, if possible, you can pitch the silage out of the silo into it; get good clean gravel and good cement; be sure to pound the concrete well in the wall; make the concrete rather dry; oversee the placing of the wires in the wall; if you would get a good handy scaffold-builder it would facilitate the work greatly, because it takes a long time to rig up a scaffold; raise your scaffold 10 feet at a time, so that you can fill two rings above the scaffold and two below it in the one raising. Add to these suggestions a few minor details, and you should have no trouble about building a good permanent silo.

We believe the silo almost an essential to successful stock-raising. We feed silage to all classes of live stock, and, during our limited experience, are well satisfied with results.

Elgin Co., Ont.

H. S. McDIARMID.

Agricultural Suicide.

Editor "The Farmer's Advocate":

I have seen some discussion in "The Farmer's Advocate" lately regarding the management of farmyard manure, and it seems to me it will bear a good deal of thought. We may have our opinions and prejudices, but, after all, the best teacher is experience, especially if our experience is corroborated by the results of accurate experiments carried on at our Experimental Farms. The fact that the manure pile loses both in weight and quality by fermentation or "heating," cannot be too forcibly impressed upon our farmers. It is enough to make one nervous to see a large pile of manure with the smoke rising from it, and I have wondered if the owner realized that this valuable piece of property was really burning up. On practically level land, containing a fairly large amount of vegetable matter, I would prefer spreading the manure on the land as soon as it is taken from the stable, even when the ground is frozen; but my experience is that, in the Maritime Provinces, where the land is quite rolling, and where the winters are not so steady as in Ontario, there is considerable loss in applying manure on fall-plowed land for a root crop. When the mercury goes up to 40 or 45 degrees for twelve hours, and is followed by heavy rain, there is certainly quite a heavy loss by washing. My plan is to take the manure directly from the stable to the field, and pile it in large, square piles, not less than five feet high. The manure from the horse stable is not, under any circumstances, allowed to be taken to these piles, as it will ferment and cause the whole pile to heat, but it is spread on the surface, preferably on a grain stubble that has been seeded to clover. The manure that is put on the piles is spread over a space four or six feet square every day, so as to give it a chance to freeze solid; and when a large pile of manure is frozen solid it will not thaw out much before the middle of May, and consequently loses nothing by fermentation.

I prefer piling the manure on the land that is to be in roots, and spreading it in the spring with a manure spreader, as it can be done better than by hand, and is more easily incorporated with the soil. I have never tried a manure cellar, but I do not think I want a manure cellar under my milking cows, and I consider the plan of throwing the manure under the eaves and leaving it there all summer, to be applied in the fall, nothing short of agricultural suicide.

C. H. BLACK.

Cumberland Co., N. S.

Rotation of Crops.

Editor "The Farmer's Advocate":

The rotation we are practicing, and find very good under our conditions, is a four-year rotation, as follows: First year, clover, cut for hay; then the earliest cut portion is cut again for seed, and the remainder is pastured during the late summer and autumn months. Second year, oats and timothy; generally about two-thirds oats, or perhaps all oats, according to amount of hay required. Third year, hoed crops—corn, turnips, mangels, etc.—on the previous year oat ground, and peas on the timothy sod. Fourth year, winter wheat on the previous year pea ground, barley on the root ground, all seeded to a mixture of clover and timothy. Have a rolling field seeded to permanent pasture for cows and working horses, and young stock are pastured on a low-lying pasture farm.

A. W. P.

Simcoe Co., Ont.