

sidered from side to side; from end to end, one is about the middle, and one near each end. Each outlet is 2 x 4 feet, and leads directly to the peak of the roof. The total outlet area is thus about 24 square feet, or about 36 square inches per head. Both incoming fresh air and outgoing foul air currents are controlled by dampers or keys. It is thus possible to regulate the temperature to a nicety. During the winter of 1907-08, whatever the temperature outside, the thermometer inside stood around 48 degrees F.

The windows are all hinged at the bottom, excepting those that extend to the ceiling on the south-east exposure; these latter are hinged in the middle, and all open in from the tops. They are held at about a 60-degree angle by means of chains. This permits of ample air currents when warm weather necessitates an otherwise abnormal circulation of air.

Water is constantly in front of the cattle in small drinking fountains. If desired, the mangers may be filled with water fit for drinking.

FACILITIES OR CONVENIENCES.

The feed room is not remarkably large, but permits of preparing enough feed for two or three days for 150 to 160 head. It is situated close to the silos (700 tons capacity), near the meal bins, and may be supplied with straw or hay from overhead. A root pulper is located conveniently. Roots have to be hauled in about once a week when being used in large quantities.

Scales at the feed-room door permit of easily weighing the feed, which is carried in carts running on the floor. Some cattlemen seem to consider the suspended feed carrier the better plan, but the Agriculturist, Mr. Grisdale, does not agree.

The manure is removed by barrows, there being no overhead tracks for this purpose, any more than for the transportation of feed.

The cattle are tied by means of stanchions. Swinging stanchions are used, as they permit of cattle rising more easily, and give them more liberty when on foot. The advantage of the stanchion over the chain lies in the fact that where stanchions are used, stall divisions of a cumbersome or light-obstructing character are not necessary. When chains are used, solid divisions are necessary to prevent horned animals injuring each other. The divisions in use are constructed of 1½-inch boiler pipe. These are set one foot deep in the cement floor, rise vertically 2½ feet, turn at right angles, and extend horizontally 2½ feet, to be screwed into a species of bracket bolted to the 6-inch squared posts carrying the stanchion support. In the case of large cows, these pipes rise 3 feet, instead of 2½ feet, the horizontal reach also being 3 feet in length. Large cows are allowed 3 feet 8 inches clear between divisions, smaller animals having 3 feet 2 inches, only.

The walls are of stone, sheeted inside with "V" joint. This, while costing considerable money, is an improvement, the value of which in increased comfort and better sanitary condition can scarcely be overestimated. The upper floor has been ceiled, and here again the effect upon the cleanliness and brightness of the stable has been most marked.

Good Substance.

"In our study of dairy cattle, we have been impressed with the constantly-recurring fact that the cows that do great work show in their make-up a certain appearance of good substance. There is an amplitude of form in them that betokens power to do, ability to stand the strain of doing. This is largely shown in what may be called the 'middle piece,' that portion of the body between the shoulders and the hips.

"These great cows, in all breeds, have ample machinery to do business with. This does not necessarily mean large size. Right there is where certain men run away with themselves. There is a law of nature in this. We cannot expect something for nothing. The machinery of the cow's body must be sufficient for the demand her nature and temperament makes on it. A good cow must be well and harmoniously developed, with large, strong digestive organs, ample milk-making organs, plenty of room for the making of a calf, for great dairy capacity is based on the procreative organs.

"We must look to constitution, ability to stand up and bear the strain of dairy work, more than we have. There is danger in our breeding that we will be led away from this point, and follow off after mere ability to produce milk for a week or a month. To do this work for a long time, the cow must have sufficient substance in her make-up. There must be no weakness of build anywhere. In common phrase, she must be a 'strong cow.'"

The above, from Hoard's Dairyman, is exactly what "The Farmer's Advocate" has been contending. For sustained effort in production, and, above all, for capacity to perform, and also transmit the capacity for performance to offspring, we must have a degree of substance in our dairy stock. Constitution, vigor and capacity are the springs of vitality from which production is supplied.

Price of Mill Feed.

Editor "The Farmer's Advocate":

Your editorial on the bacon-hog situation is a good one, and to the point. I have not noticed any decrease in the number of hogs kept here; in fact, the shipments at our point have shown an increase this spring. Of course, some farmers went out of hogs, and are now feeling dissatisfied, when they have none to sell at the present high price.

The high price of mill feed is against feeders, and some of them say "things" when they are asked to pay \$26 per ton for shorts at the local mills, and then read in the Montreal market reports that shorts are quoted at \$21 in Montreal. This plan of charging the farmer one to two dollars a ton more for feed than they sell it at in the east, is one cause of his going out of wheat-growing in Waterloo County at least, as he grows coarse grain, instead, and does his grinding at home.

Waterloo Co., Ont.

THE FARM.

Twenty Miles of Tile on One Farm.

Editor "The Farmer's Advocate":

There are many benefits to the farmer who underdrains wet lands. Where land is thoroughly underdrained, the farmer can start seeding, as a rule, much earlier than on wet lands not under-

am speaking from experience on heavy clay land, with some black loam on surface in low land, all the land having a hard-clay subsoil, being in Wentworth County, two miles south of Hamilton.

Farmers, when drawing manure on fields, generally place the most of the manure on the poor hills. Why are they poor? Because the surface-wash during heavy rains carries down not only the bulk of the manure, but the best of the surface soil, also, leaving the poorer subsoil on top, and the better soil is flooded down on the low-lying land; and, with the larger surface-wash in the hollows, much of the best soil is carried down the creeks and rivers to the lakes and oceans, probably to make good farms in the distant future for generations unborn. People formerly drew many loads of black soil, washed out of my field on the road, before it was drained, to fill flower pots; they do not come now. The manure and soil remain in the fields; chiefly the clear water filters off.

The soil is warmer where well drained, and spring or fall crops will keep growing during the chilly weather, such as we have had this spring; while on sour, wet land the soil is colder, and on such soils the crops may be at a standstill, or going back.

Fall wheat may be sown later on drained land, and then have a larger crop. Fall wheat seldom or never heaves out with the frosts in spring on well-drained land, while any farmer knows what will happen to it on wet soil. One year I sowed fall wheat on the drained land late in the fall, after the fields were finished where the land was

not drained, knowing that the wheat on the drained land would likely have enough top. The fields on the land not drained yielded 25 bushels per acre, while the wheat on the drained area yielded 43 bushels per acre, although the last was caught in rain for about a week before it was cut, and many of the heads broke off while cutting, losing about seven bushels per acre.

There is pleasure and satisfaction in working on dry, loamy soil, where you can use a seed drill without clogging during the latter part of March or early in April, rather than trying to mud it in near the end of May, as many are doing this year, and then blame Providence, who doeth all things well, for this state of affairs, when they are entirely to blame themselves. Truly, with regard to underdraining, as well as many other matters, "God helps the man who helps himself."

Underdraining lessens the labor required to get the seed-bed in good shape. Although our soil is heavy clay, one year we sowed 44 acres of oats on drained land, each weekday, from March 20th to 28th, and all but about one acre was just harrowed over with spring-tooth harrow, while, but for levelling, we could have drilled it without harrowing, and we did drill some that way, and we had a good crop of heavy oats.

I consider the time used in proper surface ditching for three years would be about equal to digging an underdrain 3 feet deep, and there would be the cost of tile and plowing in of soil on drain extra; while land properly underdrained requires few, if any, surface ditches, thereby leaving a smooth surface for machinery. My experience has been with over 100,000 feet, or nearly 20 miles, of underdrains, most of which has been

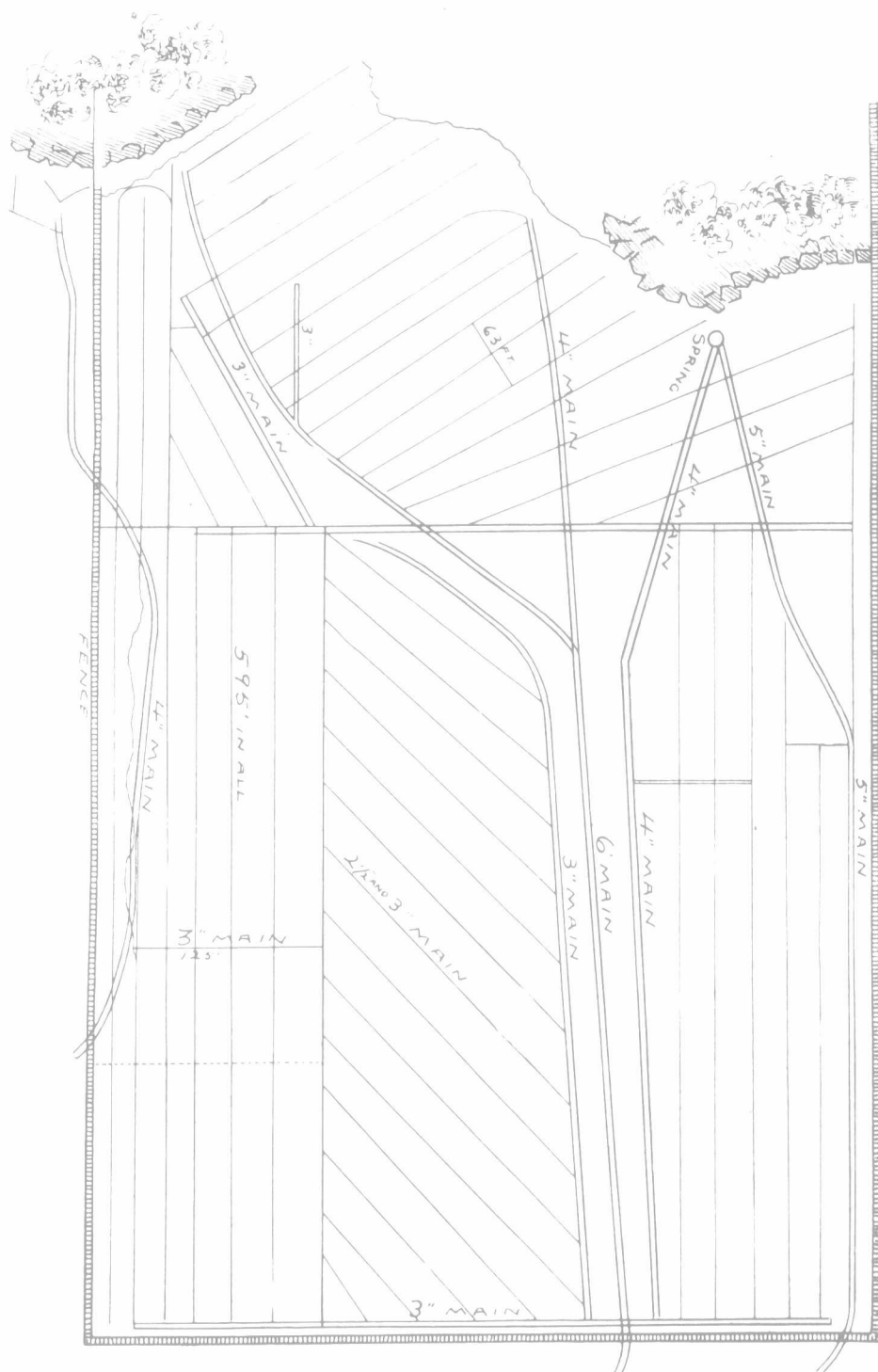


Diagram of Tile Drains in a Twelve-acre Field.

In reproduction we have, for the sake of simplicity, omitted many details which Mr. Marshall had marked on his map, such as length of each drain, distance apart, etc.

drained, and, as drained lands dry quickly after heavy rains, the farmer has a much longer time for seeding, and not many lost days in getting on the land. The soil is in a much better state to seed on when in a porous and loamy state, due to underdraining, than it would be if in a sour and wet state, as many fields are this spring, and such wet fields cannot be expected to grow good crops this summer, if they have been saturated with water. I