

to 2 feet, although I have known tiles to be laid 4 feet. In the latter case, however, I have seen the land so wet, after a heavy rain, that horses could not get through it, while in the same field, with the tile at a depth of 2 feet, the soil was quite firm and comparatively dry. As to distance apart in the field, it depends on the nature of the soil. With a close soil, such as ours, the drains will not draw more than a rod and a half or two rods. The drains should therefore be from three to four rods

THE IMPORTANCE OF SOIL MOISTURE AND HOW TO RETAIN IT.

This is one of the subjects well handled by Mr. F. M. Lewis, of Burford, and the following are some of the most important points emphasized by him, viz.: "The soil must be kept receptive, (1) to prevent surface washing, (2) to draw rain water into the soil with its fertilizing constituents absorbed from the air, and (3) to store the soil with plenty of water. Humus is a valuable constituent in making the soil receptive. Judicious cultivation must be carried on through the season to prevent the escape of moisture from the soil. The soil must be kept fine, loose, and even at the surface, since with these conditions there is less evaporation."

Prof. J. B. Reynolds, who has charge of the Department of Physics at the Agricultural College, has frequently pointed out that soil can be made thoroughly receptive only by underdraining, either natural or artificial. "Underdraining," he says, "by drawing off the surface water from the soil, keeps the land in a more open, mellow condition, and hence is the best safeguard against drought."

MR. LEWIS ON PRESENT CONDITIONS.

Mr. Lewis, after returning home from the January trip through Division 5, which comprises the Counties of Wentworth, Halton, Wellington, and Waterloo, says: "The January trip was a very good one. We had some of the very best meetings I have ever attended, and also some of the poorest. Neglecting to take advantage of the opportunities afforded is apparently the cause of failure in the districts visited. I am fully persuaded that the greatest loss to the farmers in Ontario is through the improper care of barnyard manure and the lack of intelligence in the feeding of live stock, feeding one kind of grain only, and not feeding the kind of grain to young growing stock that is best for building up their bone and muscle." There is no doubt in our mind that Mr. Lewis has got pretty close to the facts. The loss to Canadian agriculture from these two sources alone must amount in the aggregate to many millions of dollars.

EVENING MEETINGS.

Mr. McCulloch, of Peel, writes: "I do not agree with a suggestion *re* doing away with the evening meetings and in place of them allowing the delegates to visit the different farmers in the locality where the afternoon meeting is held. While they would visit three men under these circumstances, they might be talking to about a hundred. Surely the change would be folly. The splendid gathering of young people in the evening ought to be catered to. Many farmers will not allow their young men time to go in the afternoon. Then, must these be neglected altogether? Surely, addresses on such topics as 'The Advantages of Farm Life,' 'Farming as an Occupation,' etc., when well handled, must give young people something to think of, and engender in their breasts a stronger love for their calling. Again, farmers' wives and daughters should not be denied the pleasure of such gatherings as I have attended this year in Peel and West York. Here the halls were filled for the evening, the addresses were much appreciated, and the whole standing of the Institute improved. My opinion is, that instead of doing away with evening meetings, every delegate should prepare himself specially for these mixed gatherings. He should have something good to say to the farmers' boys and girls and also to the people of the towns and villages who frequently attend our meetings. In this way the producer and consumer may be drawn together and thus advance the prosperity of all classes. Another result would also be that our business would be raised to that position that it should occupy, and be placed upon an equal with other callings in life. I do not want a concert, but I do want to see good live evening meetings, with suitable practical subjects from our delegates. A little thought and attention from each one will do it, and our local talent, which is fast developing, will also help on the cause."

How to Get a Clover Catch.

To the Editor FARMER'S ADVOCATE:

"Clover is all right, but we can't get a catch any more." So common is this complaint that I deemed it worth while to investigate the subject in the light of the failures and successes of farmers, as given at Institute meetings. The conclusion would go to show that failure is the result of several causes: Bad seed is responsible for some, insufficient seeding for more. Humus and lime are important considerations; but by far the most potent cause is the drought of midsummer. Bad seed can be guarded against by buying of reputable seedsmen only, and at a fair price. Humus may be added to the soil by plowing under a green crop or by the application of barnyard manure. Lime (air-slacked, or in the form of gypsum) may be applied with the seed or a little later on the growing plants, and nearly always with great advantage. The tendency to "heave" in spring may be overcome by underdraining, the best substitute being a very light mulch of coarse manure or straw. But how shall we overcome the summer droughts? This may be done by such a preparation of the soil as will enable the clover plant to get a supply of moisture from the subsoil after the spring rains have ceased. Spring plowing, or even late fall plowing, does not secure this condition. This breaks the continuity of the surface soil and subsoil, and thus prevents water passing by capillary action

from the subsoil to the surface. We have here the same conditions that we have in a lampwick cut above the oil, but held together by a few threads, with a space between the two parts. No one would expect such a wick to work; perhaps, neither should we expect spring plowing, with ordinary preparation, to furnish a continuous ordinary for capillary action from the subsoil to the surface. It is not surprising, therefore, that farmers have reported failures almost universally from any attempts to get a clover catch from spring plowing or fall plowing that has not received more than ordinary care.

By far the commonest method of seeding to clover is to sow on fall wheat before the last snow has disappeared, and trust to the action of the frost to cover the seed. Less frequently, the seed is sown later, and a harrow or weeder used to cover it. Both methods are quite successful on land summer-fallowed the previous year. In fact, many farmers report that they summer-fallow to be sure that they will get a "catch" of clover. If, however, the fall-wheat ground has been stubble turned over roughly, and seeded before it has been thoroughly pulverized and compacted, failure is almost certain. The clover seed will germinate and grow as long as the spring rains continue, and then die.

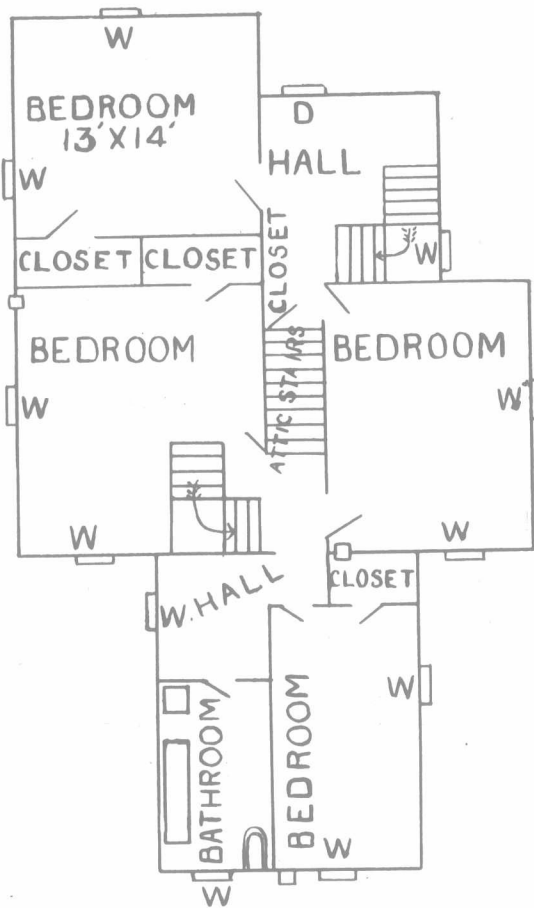
Mr. Geo. Ries, of Bentick, has not had a failure in clover in twelve years, many of them very dry. He gang plows and cultivates stubble as soon as the crop is off and repeatedly afterwards till a very fine seedbed is secured. He has thus the same conditions of soil as in a good summer-fallow, and harvests a spring crop as well.

Many farmers in the County of Norfolk seed with buckwheat, with excellent results. The soil in this case is invariably a medium or very light sandy loam.

Another method, which I have practiced and recommended for many years, is to seed down after a corn crop with spring grain. If the corn stubble is long, it is knocked down with a plank or roller before snow covers the frozen ground, and left till spring, when a seedbed is made with a disk and harrow, *but without plowing*. The clover seed is sown with the spring grain, throwing it in front of the tubes. If a roller is used after seeding to press into the soil any corn roots that may have been turned out by the disk, let it be done when the surface is dry.

If the corn has been planted in hills and has been well cultivated both ways, we have obtained all the good results of a summer-fallow and a crop at the same time. Of course, root ground treated as here recommended for corn stubble will give the same results.

The amount of seed has something to do with the certainty of a "catch." Successful seedings have been reported with any amount from six to fourteen pounds per acre; but the percentage of failures becomes smaller, other things being equal,



SECOND-FLOOR PLAN OF D. PENNINGTON'S HOUSE.

apart. One thing I have noticed is, that the soil about the drain becomes more porous and that the drawing power increases as the time goes on."

MANURING.

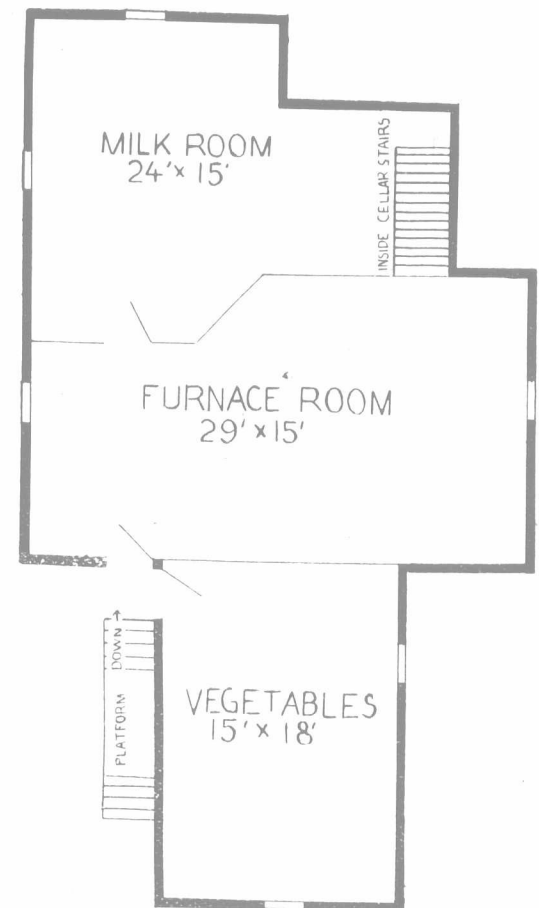
Mr. McMillan has covered sheds for storing manure for any length of time, hauling it and spreading it on the land when fresh, instead of allowing the best of it to leach away, as is too often done. In order to make the manure easier to handle and to mix with the soil, he has for some time followed the practice of chopping the straw while threshing. With this plan it was possible to store the straw in much smaller compass in the barn.

PROF. G. E. DAY LEADS IN THE DISCUSSION.

He drew attention to the defect, from a manural point of view, of continuous clover-growing. Clover adds nitrogen only to the soil, and so far as clover is concerned, the other constituents, potash and phosphoric acid, may be depleted, and after a time the soil be impoverished. "Mr. McMillan," he remarked, "was avoiding this possibility by feeding large quantities of bran to his stock. Bran is rich in potash and phosphoric acid, and these constituents returned to the soil with the manure when bran is fed." Mr. Day added, that on account of barnyard manure being generally deficient in potash and the phosphates, it may be necessary, sooner or later, for farmers of this country to resort to some form of artificial fertilizers, as farmers in older countries have already done. In speaking of Mr. McMillan's methods of plowing only once in three years, Prof. Day approved of the principle, namely, of keeping at the surface, for the use of crops, the manure which had been given to the soil. But the plow serves a very important purpose in keeping the subsoil in the right condition. As yet no implement had been found to supply the exact need of loosening and stirring the soil to the proper depth without inverting it. Any inventor who would bring forward such an implement would confer a great benefit upon the farming community.

MANGELS.

"How far apart do you make your drills for mangels?" someone asked Mr. McMillan. "Twenty-five inches," said he in reply. "You may be able to grow bigger mangels by placing the rows farther apart, but when I was judge of field roots in this Province, I found, by actual measurement, that a distance of 28 inches gave the best yield in bushels per acre." It will be remembered that this is exactly the distance recommended by Mr. Simpson Rennie, as printed in our last annual report. Mr. Rennie stated there that where he grew these roots on the checkered-row system, he marked his rows off 28 inches each way, and planted with a corn planter. He then singled out one plant in each place and scuffled both ways. Where Mr. Rennie plants in single rows, however, he makes his drill 30 inches apart, using four pounds of seed to the acre. After sowing, if the land is dry, he rolls the drills with a common land roller, and finds that the seeds will germinate much more evenly.



BASEMENT PLAN OF D. PENNINGTON'S HOUSE.

as the amount of seed becomes larger. It is not safe to sow less than twelve pounds to the acre.

There is no crop grown on the farm that gives such large returns in fodder as corn. It is almost essential in the economic production of beef or dairy products in the winter. In the future farmers will find an additional virtue in the certainty with which they can get a catch of clover after it, if they do not use the plow.

Essex Co., Ont.

A. MCNEILL.