# THE FARMER'S ADVOCATE.

# States.

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The account published in the "Farmer's Advocate " for March 15th, of the burning of Mr. S. A. Freeman's large and valuable barn through spontaneous combustion arising from the storage of a large quantity of shredded corn in a barn mow, has occasioned a great deal of discussion and emphasized the need of some care in handling fodder in that way. It is a common practice in the Western corn States, where the atmospheric conditions possibly favor dry curing rather more so than the moister climate of Eastern Canada. Enquiries addressed to the heads of the Experiment Stations in Illinois and Iowa have brought us the following information, which we give for the benefit of Canadian farmers. The general practice there is, we understand, to remove the ears before shredding.

#### ILLINOIS.

The farmers in our State have stored hundreds of thousands of tons of shredded corn the past season without any disastrous results. In some cases the stored fodder when put in the barn damp, or green, or was not packed sufficiently, heated. By tightly closing the barn, however, allowing the least possible air to enter, this heating was no serious consequence, and the fodder came out of the barn as bright as the day it was put in. In all events, when the fodder becomes heated, air must be kept away from it. The heating process is due to the action of certain organisms, which require oxygen to carry on their work. By cutting off the supply of oxygen as by tightly battening the barn, the work of the organisms will be prevented, and the heating of the A. D. SHAMEL. fodder will cease. Dept. of Farm Crops.

## Illinois Experiment Station.

#### IOWA.

In the corn-belt States, the corn that is preserved for fodder or stover is generally cut during the first half of September. The period of cutting may vary five or ten days with the season. The most desirable condition is reached when the ears are fully formed and well dented and the leaves of the corn plant beginning to turn brown, although in some seasons the denting stage of the ear arrives before any of the leaves have dried and changed color. The method of storing shredded corn fodder depends largely upon the condition of the plant at the time of bringing the crop from the field. It has been found by chemical analysis that corn fodder standing in the field for thirty to forty-five days after cutting usually contains about 40% of water. This will also vary somewhat with the conditions of the season. Thirty days later it usually contains about 25% of water moisture. Corn fodder containing 25% of water may be shredded and stored in an ordinary haymow or similar apartment without any danger of spontaneous combustion, although there will be considerable rise of temperature for several days after the product is first stored. When corn fodder contains as high as 40% of water, the heat formed in storing the stover will be much greater, and there will be correspondingly greater danger of burning from spontaneous combustion. The orn fodder that is shredded and stored in October is usually in this condition, except in cases of very dry autumns and unusually favorable conditions for early maturity of the crop. Corn fodder that is left in the field and not stored until the latter part of November or December', seldom contains enough moisture to endanger its keeping C. F. CURTISS. qualities.

Storing Fodder Corn in the Western dition to be used as litter, making a first-rate ab- Is Buying Preferable to Raising Feed or sorbent.

As to the best method of storing the fodder, the first essential is that the fodder shall be well dried and well cured. Many of our feeders prefer sufficient amount of moisture to encourage a mild fermentation, resulting in the development of a flavor approaching that of mild silage. This winter we shredded a large quantity of fodder early in the season, running it directly into a mow, and storing it to a depth of eight or ten feet. We think it essential that the fodder Le piled up as loosely as possible, hence we used a machine with a blower attachment. If the shredded fodder be tramped down solidly it is much more likely to become overheated.

The mixing of straw or clover hay with the shredded fodder does not seem to improve matters very much, as we have known of cases where a large mass of alternate layers of fodder and straw became entirely worthless. We think the chief factors for success in the storing of fodder are to have it well dried and loosely piled up.

J. J. FERGUSON. Michigan Agricultural College.

### Road Drainage.

Many, if not most, country highways could be considerably improved by thorough sub-drainage. Most roads need underdrainage even though water does not stand in the side ditches. Most people appear to think that the sole object of tile drainage is to remove the surface water, but this is only a small part of the object of the underdrainage of roads.

The most important object of underdrainage is to lower the water level in the soil. The action of the sun and the breeze will finally dry the surface of the road, but if the foundation is soft and spongy, the wheels wear ruts and horses' feet make depressions between the ruts. The first shower fills these depressions with water, and the road is soon a mass of mud. A good road cannot be maintained without a good foundation, and an undrained soil is a poor foundation. A dry subsoil can support almost any load. A friend of the writer, an intelligent man and a close observer, claims that even in a dry time the easiest digging on or around a farm is just under the surface of a road having no underdrainage. His theory is that except in the road vegetation is continually pumping the water up from the subsoil and giving it out into the air, while in the road the compact surface prevents evaporation of the water in the subsoil. Therefore the road needs underdrainage more than the field.

 $\Lambda$  second object of underdrainage is to dry the ground quickly after a freeze. When the frost comes out of the ground in the spring, it thaws quite as much from the bottom as from the top. If the land is underdrained, the water when released by thawing from below will be immediately carried away. This is particularly important in road drainage, since the foundation of the road will then remain solid and the road itself will not be cut up like untiled roads.

A third, and sometimes a very important object of subdrainage is to remove what may be alled the underflow. In some places where the

Grain Under Nova Scotia Conditions?

A friend of mine, who is agent for several prominent milling firms in Ontario, recently told me that during a trip of several days to the most advanced, rich and fertile farming section of this Province (Nova Scotia), he sold four carloads of Ontario grain and feed among the farmers of that district. Now, to my mind, this affords food for reflection. The old statement of carrying coals to Newcastle comes to my mind, for if any section east of Montreal is capable of grain and root production, that district is ; but the fact remains the same. Farmers all over this Province buy enormous quantities of imported grain for feeding purposes that in nine cases out of ten they could profitably raise. Many a farmer will take to town ten bushels of oats (this being the staple grain of the Province), sell them at 45 cents per bushel, and take back home 18 bushels of the poorest bran or four bushels of corn meal, and think he .s making a great exchange. The average farmer, when asked if he could not raise a substitute for this imported feed, looks at you with the information that is always an excuse for laziness or ignorance, and says, "It won't grow.". "Did you ever try to raise corn and roots as a substitute ?" "No; takes too much manure." Every question is evasively answered in order to give the information that such a thing won't grow or costs too much to grow, and thus, beyond a bit of hay, a few oats and taters is his sole reliance. In the old days, when hay was all cattle got from October to June, there was some excuse, but in these times, when agricultural knowledge is so widely diffused, there is no reason whatever but that a good farm should produce everything in the way of feed without buying. Here in this Province we have the best soil and climate for corn and roots of anywhere in the Dominion. Peas, oats and buckwheat grow to perfection, and barley would do equally as well as oats; still, strange to say, a person driving through this Province will seldom see more than half an acre devoted to these crops and the rest of the farm in hay, the most of it eight-inch wire-grass and brown-top. It is time that the won't-grow argument was properly answered. Why, if the same money spent for imported grain was invested in fertilizer, and the same crop or a substitute grown, would it not be money both earned and saved to the farmer? Take corn meal, for instance. Farmers invariably tell you that corn won't ripen sufficiently for that purpose. The whole truth is they never gave it a proper trial. At the late exhibition there were nearly a dozen varieties of ripe ears exhibited, and that was the first of September. There is no reason whatever that it could not be more cheaply raised than bought if the right varieties were planted and more fertilizer and care in cultivation used. Barley, oats and buckwheat could be more extensively grown and their cost of production cheapened, and they are equal, if not superior, to imported wheat and corn. Green corn, turnips and mangels have been raised in immense quantities by some farmers, but the great majority consider them more trouble than they're worth and do not attempt to grow any. If one half the land that is now in wire-grass and brown-top were turned over, properly fertilized, and good seed of clover or the improved grasses sown, it would lessen the necessity for buying so much grain but the argument that seed and fertilizer cost money is quoted in every case. They apparently do not consider that buying grain takes money also, and does not result in the improvement of their farms, but rather the reverse. Is it any wonder that farming, except in a very few cases, is looked on as a losing business by many Nova Scotians, and that the exodus to the United States and the cities is not abated? When the day comes, which I trust will soon come, when the people see the capabilities of their neglected farms when treated to more generous fertilizing and an application of brains, and resolve never to buy anything that they can profitably raise or a substitute, then will prosperity increase and the people will be more happy and contented, instead of dissatisfied with their condition and the country, as far too many are at present. NOVA SCOTIAN.

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Iowa Experiment Station.

#### MICHIGAN.

Regarding the best method in use for the storing of shredded corn fodder among the farmers of this State, I would say that there is a very great difference of opinion on this point. The corn shredder has come into very general use, and is preferred to the ordinary cutter so much used in Canada. The advantages claimed are, that the shredded fodder is much more easily handled, since it can be carried around with an ordinary fork, dispensing with the use of a basket or feed truck. Most farmers tell us, further, that there is not so much danger of loss from overheating of the shredded material as occurs when the fodder is finely cut. We know that there is a great deal of trouble experienced where large quantities of corn are run through, the cutter and stored on the feeding floor or in a mow.

At this College we have fed a large amount of shredded fodder during the last two years with uniformly satisfactory results. We believe more of the fodder will be heated when it is cut and mixed with cut sheaf oats, clover hay, or pulped roots, as the case may be. With the shredded fodder animals have a much better chance to pick out the more appetizing parts of the fodder and reject the coarse fiber. We find that while there is a large amount of shredded fodder rejected, more especially as the season advances, it is not wholly wasted, since it is in the very best possible con-

ground is comparatively dry when it freezes in the fall, it will be very wet in the spring when the frost comes out — surprisingly so, considering the dryness before freezing. The explanation is that after the ground freezes, water rises slowly in the soil by hydrostatic pressure of water in higher places; and if it is not drawn off by underdrainage it saturates the subsoil and rises as the frost goes out, so that the ground, which was comparatively dry when it froze, is practically saturated when it thaws.

The underdrainage of a road not only removes the water, but prevents, or greatly reduces, the destructive effect of frost. Frost is destructive only where there is moisture. The upheaving action of frost is due to presence of water. Water expands on freezing, and loosens the soil; when thawing takes place, the ground is left spongy and wet, and the roads "break up." If the roads are kept dry they will not break up. Underdrainage helps to keep them dry.

It is the universal observation that roads in the low places which are tiled dry out sooner than the untiled roads on the high land. The tiled roads never get so bad as those not tiled. There is no way in which road taxes can be spent to better advantage than in tiling the roads.-I. O. Baker, Illinois.

Mr. Geo. H. Armstrong, Russell Co., Ont., writes that he is well pleased with the "Farmer's Advocate," finding " great reading " in every part of it. As he is only just starting in farming himself, he finds it hard to follow the footsteps of some writers of ample means in improving their stock, but still, he adds, "I can't eat, if it is mealtime, till I open your paper, as I am a lover of horses, and see those good engravings."

### Pleased with Paper, Pictures and Knife.

I received the four large pictures - " Canada's Pride," " Canada's Glory," " Canada's Ideal, and "Canada's Columbian Victors" - in good condition, and am very much pleased with them. I thank you heartily. They are just as described in the "Advocate." One person who saw them offered me 50 cents for one, but I told him to get one or two new subscribers, then he could get two of the pictures or the four. My father also thanks you very much for the knife, with which he is well pleased. He thinks it of good quality. One of the subscribers he secured said that the Christmas number alone was worth the money, and said he would not like to be without the "Farmer's Advocate" any more, and the rest of the subscribers are well pleased too, so we shall endeavor to get more subscribers for your valuable paper. M. COOK. Perth Co., Ont.