

read about timothy, it is this: That it is shallow rooted, feeding only in surface soil, and therefore very exhaustive. But, perhaps soil to depth of two feet is surface soil, and roots no deeper than that are shallow, but if so, then we have not understood it right. Is it possible, Mr. Editor, that the authorities have been wrong on this subject?

T. BATY, Wilton Grove.

[NOTE.—One investigator, Schubart, found the fibrous roots of rye, beans and garden peas about 4 feet below the surface; winter wheat, rye, and clover, 3 to 4 feet; and the roots of winter wheat, in a light subsoil, 47 days after sowing, as deep as 7 feet. In a season of drought like 1894, plants would doubtless go deep after moisture. Several interesting points are suggested by Mr. Baty's letter for students of plant growth and the soil.—Ed.]

How to Build a Round Silo.

In the Feb. 1st ADVOCATE we referred to a very successful round silo constructed by Mr. R. J. Potter, Mono Mills, in the county of Cardwell, Ont., which has awakened a great deal of interest. Many enquiries have been made for "further particulars," and in order that all might have the benefit of his experience, Mr. Potter, at our request, has taken the trouble to prepare the following statement describing his silo, method of construction, and cost, which we trust will be helpful to any who purpose adopting this plan:—

Description.—My silo is 18 feet in diameter, and 20 feet high. It is built of 2x6 inch pine plank, 20 feet long—dressed on one side, jointed and bevelled to suit. It is set on a cedar plank bottom, cut round to an 18 feet 3-inch diameter. This floor is laid on seven cedar sleepers, properly bedded and levelled. It is held together by means of 7½-inch round iron hoops, made in two pieces, and with a thread and nut on each end of each piece. These threaded ends pass through two 4x1, and 20 feet long, rock-elm scantling placed on opposite sides of building, and are held in position by means of the nuts. Under each nut I have placed a strong, malleable iron washer, so that when the tightening process begins the nuts may not sink into the scantling.

Construction.—In building it we began by putting two of the hoops, the bottom and middle ones, in position, the lower one six inches from the floor, and the other ten feet. This is done by putting up the scantling, through which the ends of hoops are to pass, and bracing them in position, then passing ends of hoops through them, and putting a brace or prop under each half of hoop in the centre between the scantlings. We bent the hoops by passing them through a blacksmith's tire bender, laid on its side on a couple of blocks. The exact set to give the machine, so as to give the hoops the correct circle, was found by running through a piece of hooping until it fitted exactly on a circle scratched on the ground, having an 18 feet diameter. When we set up the first stave we fastened it in position by driving through it from the inside, and just below the middle hoop, a four-inch wire nail, and then bending this nail up around the hoop on the outside. We fastened the bottom in the same way, and this was done with every stave until the last one was in position. As soon as all the staves are in their place, tighten the two hoops already up, and put on the remaining five. This, with me, completed the silo, with the exception of a few poles, and a couple of loads of pea straw by way of roof, as a substitute for a more expensive one. This kind of covering is unsightly, but it is cheap, and from the way my silage is turning out this year it appears to be all that is necessary. Before putting up any staves, a temporary rim made out of inch lumber, cut with a hand-saw to the proper circle, should be tacked to the floor on the inside, so that the staves might be fitted against it. If this is done, there will be no necessity for putting a nail through the bottom of each stave, and it will be much easier to keep them plumb.

Cost. To build it we required:—

2,400 ft. pine plank, 2x6, and 20 ft. long, at \$16 per thousand.....	\$ 38 40
Jointing, dressing, and bevelling same, at \$3.50 per thousand.....	8 40
650 ft. cedar plank, at \$12.50 per thousand.....	8 12
Dressing and jointing, at \$3.50 per thousand.....	2 27
60 lbs. 1 in. round iron hooping, at \$2.50 per cut.....	15 00
28 pieces of 1½ in. round iron hooping, 12 in. long, with 6 in. thread and nuts.....	3 20
28 malleable iron washers, at 6 cents each.....	1 68
42 welds in hoops, at 10 cents each.....	4 20
Total cost, not including labor.....	\$ 81 27

The cedar for sleepers is not included in this estimate, as we had cedar of our own. This timber, with nails, would probably increase cost to \$85.00.

"It will pay any farmer to keep a flock of a score or two of good sheep merely for the manure they will make. A flock of sheep is the best fertilizer manufacturer in existence. Now is the time to pick up a flock, while so many foolish shepherds are throwing them away. One hundred per cent. profit will thus be made in one year, but take care to select only the good ones."—[American Sheep Breeder.

Capt. Jas. Robson, of Ilderton, Ont., reports a case of profligacy this spring in one of his Lincoln ewes that would do credit to a Dorset-horned, viz., five lambs at a birth, of which three were living, though one—a very large ram lamb—lively survived.

DAIRY.

To Patrons of Cheese Factories.

BY T. B. MILLAR, INSTRUCTOR FOR THE DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

As the season approaches when the cheese factories throughout the country will again be in full operation, it would be profitable for dairymen to glance over the past, see where we have done well and where we have made mistakes, and from the knowledge of these be prepared to do better work this coming season. In this article I have endeavored to point out some of the mistakes that have come under my notice.

Care of Cows.—One of the first mistakes made by dairymen, and especially by patrons of cheese factories, that I wish to speak of, is the great mistake of not preparing summer food for their cows. Looking at it from a business standpoint, it is quite as essential that food be prepared for summer feeding as for winter, as it is during the summer months that the patrons expect to make the most profit from the cows, and the profits depend greatly (more than most people realize) on the feeding and care of the cows.

Cows should have free access to a plentiful supply of pure water. Milk, as we all know, contains about eighty-seven per cent. of water, and if the water supply be impure or tainted the milk will be of a like quality. True, the quality of milk may be improved by aeration immediately after milking, but here the warning of the old adage comes to us: "An ounce of prevention is better than a pound of cure," and in almost every section of Ontario good water may be procured at a small cost.

Milking.—A great many dairymen pay no attention to regularity of milking; some milk between five and six o'clock in the morning and any time from six to nine o'clock in the evening—a very good plan whereby to lessen the supply of milk. To ensure an even flow of milk, cows should be milked at a regular time; the time as nearly as is possible to be divided equally, leaving twelve hours between the times of milking.

Utensils.—Then the utensils used, such as pails, strainers, etc., should be made of tin, all seams of which should be properly soldered, so that all crevices are filled up, thereby removing every possible lodging place for bacteria or germs of any kind. These pails should be properly washed and thoroughly scalded with boiling water immediately after using, instead of, as I have often seen, trying to wash and scald half a dozen pails or so with less than one pail of water, and that not very warm to begin with.

Straining.—A number of patrons fail to see the necessity of straining the milk that is to be sent to the cheese factory and are not too careful to see that the cows' udders are brushed and cleaned before milking, so that any sediment or foreign matter that may get into the milk is allowed to remain in it until delivered at the factory. They think that because it is strained at the factory that that is all that is required. This is a mistake,—all milk should be strained immediately after milking. This milk is to be manufactured into food for human consumption and should be handled as carefully and cleanly as the milk used at the table. It is oftentimes disgusting to see the amount of dirt of every description that is collected in the strainer used at the factory, all due to the carelessness and untidy habits of those handling the milk.

Aeration.—After straining, milk should be aerated until the animal odor is allowed to escape; this is as essential for the morning milking as for the evening. A greater quantity of un-aerated milk is required to make a pound of cheese than of aerated milk, and it is those who never aerate the milk or assist in any way to improve the quality that at the annual meeting find fault with the high average. Aeration should be done where the surrounding atmosphere is pure, and the milk which stands over night should be kept as far as possible from all bad odors. At times we find the milk standing over night in the barnyard, and much surprise is expressed by the owner when informed that the milk supplied by him is not perfect in flavor. He exclaims, "I cool the milk every night," but on inquiring we learn that this has been done by placing the milk can in a water-trough in the same yard. If properly aerated and not more than one hundred pounds in a can, it is not necessary to cool milk by the use of water in order to keep it sweet over night, even during the hottest weather.

Care of Cans.—In most sections it is customary to return the whey to the patrons in the milk cans. This should never be done, not only because it is injurious to the can by destroying the tinning, but what is more important, a large percentage of the bad flavors complained of in cheese can be traced to this practice of returning whey in the milk cans. While I admit that with proper care the cans may be cleaned, yet the fact remains that a percentage are not cleaned, and where fifty are careful and clean, one careless and untidy patron will undo the good work of the fifty.

At sunset cans may be seen on the milk-stand with the sour whey still in them; when milking time comes they are hurriedly emptied, washed in lukewarm water, and the new milk is poured in. Is it any wonder that at times cheesemakers have a batch of cheese that is declared off-flavor? If patrons were alive to their own interests they would not allow a pound of whey to be returned in the milk cans under any consideration, but would make provision to have it fed near the factory.

A common mistake is to leave the cans standing around unwashed for two or three hours after being returned from the factory. After what has already been said it is almost needless for me to say they ought to be washed as soon as possible after they are returned.

First rinse with cold water, then wash with hot water and scald with boiling water, and set them in a sunny, clean place to air. Never use soap on any utensil in use in the dairy; scour with salt, or soda, which is much better, as either of these leave no objectionable flavor, as soap is almost sure to do. After scalding never use a cloth for drying,—if the water is as hot as it ought to be they will dry of themselves in a minute or so.

In my work as inspector and instructor throughout Western Ontario, I find much to commend, but it also gives me many opportunities of seeing where a little care and forethought would greatly benefit this industry. This article is not written in a fault-finding spirit, but with a view to incite some to do better.

Progress the Watchword.—Canada has an excellent reputation for the quality of her cheese, but the past reputation will not suffice; we must keep advancing, and to do this we ask the patrons to cooperate with and assist the cheesemakers to make a better article in the future than we have ever done in the past.

Farm Buttermaking.

BY F. J. S.

When a Separator is Used.—When we come to think of a separator in connection with farm dairies, the probable cost first looms up; rightly so, as the question is one of profit and not of fashion. Ninety to one hundred and twenty-five dollars is about the price of hand separators, while power separators cost much more. Briefly, then, let us look into the advisability of buying a separator for private dairy use.

We believe the question revolves upon three points, chiefly: First, the number of cows; secondly, the excellence or otherwise of the system now followed for the separation of cream; and thirdly, the skill exercised in handling the machine.

As to the first, a definite answer could not be given without a knowledge of the second and third. However, we may offer a computation. How much more butter may be made from the milk of say ten cows during a season when a separator is used than when the milk is set? Suppose each cow averages as much for the season as would equal 20 lbs. per day for 240 days, or, in total, 4,800 lbs. milk each, or 48,000 lbs. milk for the herd for the season. Granting that good work is done by both the deep can and shallow pan, there will still be one-tenth of one per cent. of butter-fat less in separator than in deep can skim-milk, and two tenths less than in shallow pan milk.

This, calculated with such a herd, will give for the season 50 lbs. of butter in favor of the separator above the deep can, and about 100 lbs. above the shallow pan, which, at 20c. per pound, means ten and twenty dollars respectively. Given such a basis of calculation, any farmer may soon know if a separator will pay him, so far as his herd is concerned.

But to our second consideration—the system now in vogue. Whether or not a farmer shall use a separator will, of course, depend on the profit to be realized over and above that now made. We would say that if one has pure cold water ready at hand, and ice may be had reasonably, he should not be in a hurry to buy a separator, especially one with power; and right here we may as well say that we are not in favor of hand separators. They are hard to turn, and the farmer lacks not for exercise. They must be turned at a uniform speed to ensure good skimming, and the average hand is no better at this than at turning a fanning-mill. In short, if it pays to have a separator, it pays to have the power to run it. The deep can, if well handled, will do excellent work, and a fine product will result, and in such a case, unless one had a herd of at least eighteen to twenty cows, we think he would do well to think twice before buying a separator. While, on paper, one may make good interest on the cost of a separator above deep-can work, a large sum should not be paid out without much close thinking, as it may cripple a man in the development of his herd. The same may also be said of the shallow-pan system, but with less force. However, there is another side to the question. Many use deep cans without ice, and with rare exceptions this is disastrous—don't do it. Others use shallow pans set in rooms at high temperatures; also a mistake. In such and like cases the separator has a great advantage, and might even pay for itself in a single season if a large herd were kept. We have frequently tested the skim-milk from herds where one-fourth of the total butter-fat of the milk had not been removed. Rich skim-milk, sour milk and cream, injured by exposure while setting, with their concomitant allies, all speak in favor of the separator.

The third matter we have mentioned as a guide is mechanical skill, which is absolutely necessary, at least in fair amount, to the successful use of a separator, careless manipulation often undoing the possible benefits. It is not our purpose to enter into directions on running a separator further than to say, Follow closely the directions sent with the machine.

But to the more immediate work of buttermaking in this connection. If the cream is separated as soon as practicable after coming from the cow, more butter may be made than from gravitation