manifold and marvellous secrets, that we should not have to grope after them in the dark. Let us endeavor to prove ourselves assiduous in our application to whatever experimental work we undertake, praying, meanwhile, that we be not led into complications, but delivered from error.

THE DAIRY.

British Columbia Dairying, and Succulent Feeds.

Editor "The Farmer's Advocate":

In my opinion, British Columbia is one of the best places in the world for the dairy farmer. First, because of the high prices paid for butter and milk; second, our mild and open winters make it very easy to keep cows, as compared with the colder Provinces east of the Rockies; third, owing to our more humid climate, the pastures are very luxuriant; fourth, the winter being very short, it is not necessary to stable the cows as long as in most places. With the exception of about six weeks, the cows can stay out five or six hours a day, pick up quite a lot of feed, and get a good sun-bath. Fifth, our crops are excellent, clover growing luxuriantly.

Thousand-headed kale is coming to the front as one of our succulent feeds. This gives a crop of from fifty to one hundred tons to the acre. To get the best results from this plant, however, the farmer must have his land in the best of condition.

In a large part of the country, clover is the greatest of all the plants, not only for hay, but is preserved for feeding green through the fall and winter. A. C. Wells, of Chilliwack, the owner of the Eden Bank Creamery, and one of the most successful dairymen of the Province, puts his green clover in stacks. He has followed this plan for many years, and always finds it quite successful. On the side of a steep hill he has excavated a pit, with a high earth wall on one side and both ends, and on the other side he carefully builds up the clover as it is hauled in. He sends the mower out in the morning, right after breakfast, to cut the clover, which must be in the right stage of ripeness (about one-tenth of the blossoms dead). When the dew and dampness have dried out, which perhaps takes two to three hours, he starts hauling in. The wagons are loaded, and are driven on the high side of the pit, and it is very easy to unload down hill. The clover must be well spread and tramped, and the one side must be cut plumb, and the clover kept tight against the walls of the other side and the ends. In this manner he keeps on filling his pit until it is about six feet above the wagons, which is about as high as it is profitable to pitch his clover. This makes a stack about thirty feet high, and has over two hundred tons of good feed ready for use. Then, when he has tramped his silage thoroughly, he puts about two feet of earth on top, and his silo pit is finished. He finds that not more than two inches spoils on the outside, and that only on the one exposed side. When he wants to start to feed, he begins on the open side, removing about a four-foot strip of the earth roof, and cuts his strip down as far as he thinks he will require for the day's feed, continuing this strip day by day until he reaches the bottom. He finds that the best implement for this purpose is a hay knife. By doing this, but very little of the silage is exposed to the air at a time. He does not haul this silage to his stables, but loads it in a wagon and hauls it to a long, open shed which is provided with mangers. After the cows are milked in the morning, they are turned out to get a drink, and are then let into this shed, where they eat their fill, and then lie down for the remainder of the day. He feeds his hay and concentrates only in the stables. Many other farmers in the Chilliwack Valley follow the same method, and all speak well of it.

Thousand-headed kale has almost displaced corn silage in the neighboring States of Washington and Oregon. The best method for growing this plant in British Columbia is as follows: About the first of January, after the heavy rains are over, plow a piece of good clover sod, selecting a piece of good clay loam, if possible; manure it heavily, putting on at least thirty tons of barnyard manure to the acre. About the first of February apply a commercial fertilizer rich in potash and phosphoric acid. Put on about 500 pounds to the acre, broadcast. As soon as the land begins to mellow in the spring, give it a good harrowing with a disk or spade harrow. About the middle of April cross-plow the land and harrow alternately, every ten days, with spring-tooth or disk harrow, till about the middle of June. The land should then be in good heart for growing a good crop. About May 15th select a seed-bed for sowing the kale seed. This plot should be good rich soil, and free from weeds. Sow in drills about 12 inches apart. Put the seed in rather thickly—about one-half inch deep. Hoe occasionally, but do not thin out. The plants should be about five or six inches high by June 15th, which is about the right time to transplant. Take the team and plow, and, starting on one side, draw a furrow across the field. Have a boy drop the plants, right end up, about twenty inches apart. Another man follows and draws the earth around the plants. The team continues marking the furrows, three feet apart, until the field is finished. A cloudy day is best for transplanting. Kale grows so rapidly that very little cultivation is possible. About two or three good scufflings with the horse-hoe is all that can be done. After that the leaves begin to touch, shading the ground so much that weeds cannot grow. About the first of October the kale is ready to be fed. To gather it, two men can work to the best advantage. Take a team and wagon, and, while one man sticks a fork in a plant, the other cuts it off with a long sickle close to the ground. It is then thrown into the wagon. Three good plants, weighing 20 pounds apiece, fed right after milking, make a good ration for a cow. Of course, she needs good clover hay and some meal. Leave the kale in the ground all winter; it will stand at least forty degrees of frost. It does not seem to affect the quality of the milk like turnips, as the condensed milk and butter factories in Washington and Oregon are quite willing that their patrons shall feed it.

In growing corn, we find that a clover sod is the best foundation for a good crop. Plow in January, haul out the manure as it is made, and put on about fifteen tons to the acre. Work the ground up well with the disk and spring-tooth harrow all spring. We find that the last week in May is the best time to plant. Put it in check-rows three feet apart each way, and drop about five kernels to the hill. We always drag-harrow the land as soon as the corn is planted. This breaks any crust that may have formed, and is a good cultivation. Run the horse-hoe both ways, keeping on cultivating till the corn is quite high. We find it necessary to go through the field once with the hand-hoe to kill the weeds that the cultivator has missed. When the corn is well glazed, and before the frost comes, put in the silo. As grain is the most expensive part of our ration, we like to have our corn a little riper than most authorities recommend.

R. M. HALLIDAY.

Ontario Agricultural College.

Effect of Cream Freezing.

When cooler cans are used in making butter, does it hurt the cream to freeze, and how long should milk be allowed to stand in cans to get the full benefit of it?

A. CUNNINGHAM.

We have not noticed any particularly bad effects from allowing cream to freeze, though it is generally considered better not to allow freezing, if it can be prevented. Freezing is supposed to make butter "crumbly" in texture, whiter in color, and insipid in flavor; but, by churning and working properly, using butter coloring judiciously, and a pure culture (starter) to ripen the cream, these supposed defects may be largely overcome.

When cows are all fresh, and the milk can be cooled rapidly (within two hours) after milking and setting in deep cans, practically all the cream which will rise on milk set in cans will be up in twelve hours. However, where some of the cows are "strippers," and in summer when ice is not available to cool to 45 degrees F., or lower, it is wise to allow the milk to set for 24 hours. It is seldom necessary to leave milk set longer than 24 hours, or, at most, 36 hours, in deep cans.

The main points for good results in raising cream by the deep-can system is to have cows fresh, and cool the milk rapidly to 45 degrees F. or lower, but prevent freezing, if possible.

H. H. D.

What Will the "Average Cow" Do?

Dairy farmers are rapidly awakening to the necessity of weighing and testing each individual cow in the herd. Twenty new cow-testing associations have been organized in Quebec since the beginning of this year; twelve new ones have commenced operations in Ontario, two more in Nova Scotia, and one more each in Prince Edward Island and New Brunswick. This means at least four thousand more cows being checked up each month, in addition to the 11,800 in 1910. Probably many more members will be added this month.

The extension work provided for by the establishment of Dairy Record Centers is proceeding briskly. Centers are already in working order in Oxford and Peterboro Counties, Ont.; St. Hyacinthe, Que., and at Kensington, Prince Edward Island, with others contemplated. A supervisor has been appointed to extend cow-testing in British Columbia.

Some cows have started with excellent records for January and February. Yields of 1,690 and 1,490 pounds of milk, and over 50 pounds of fat, for the two months, are good indications of dairy possibilities for this season. What is the "average" cow intending to do this year?

Forms for recording weights of milk are supplied free on application to the Dairy Commissioner, Ottawa. When applying, the number of cows should be stated, and whether forms are required for weighing daily or on three days each month.

C. F. W.

GARDEN & ORCHARD.

Spraying: Why, When, and How.

From the writer's experience at fruit institutes, and from his observations in different parts of Ontario, and conversation with fruit-growers, he finds that there is no subject connected with the orchard on which information is more desired to-day than on spraying. So far as possible, an attempt has been made to keep the fruit-growers supplied with up-to-date information on this important subject by bulletins, spray calendars, articles in the press, fruit institutes, and short courses, but there is constantly need of presenting the facts in a new light. Consequently, the present article is meant to help to put spraying and its importance before readers of "The Farmer's Advocate" in a clear and simple way. For details as to the proper time to spray and the best mixtures to use, see the Spray Calendar, issue April 6th.

IS SPRAYING A NECESSITY FOR SUCCESSFUL FRUIT-GROWING.

We have no hesitation whatever, from our own experiments and observations, even without referring to the experience of others, in answering "yes." It would be a crime against the public to advocate spraying if one were not thoroughly convinced of its value. There seems, however, no necessity for discussing whether spraying pays. Every day, letters are coming to us asking for information on how to spray, and what mixtures to use. Many of these queries come from districts where we had no idea that anyone was interested in this matter. Moreover, whatever may have been true in past years, it is a rare thing this year to meet anyone who makes light of spraying, because last season made it very clear that only in sprayed orchards need one look for good clean fruit. Hence, thousands of men all over Ontario are planning this year to spray their orchards for the first time. So much is this the case that manufacturers of spray machines are finding difficulty in supplying the demand. To illustrate the remarkable progress that is being made in this matter, I shall mention the case of Prince Edward County. Four years ago there were not more than half a dozen men who sprayed their orchards. This year I was informed, when in the county, that nearly one thousand men are preparing to do so; and this is all due to the results that they have witnessed the last three years from careful, thorough spraying on the part of a few progressive men.

The value of spraying is also well attested by the fact that we do not know of a single really successful fruit-grower of high reputation to-day who is not an enthusiastic advocate of thorough spraying. Moreover, the apple-buyers, who should certainly know what they are doing, passed a resolution last November at the Fruit Exhibition in Toronto, to the effect that they would no longer buy apples from any man who did not spray.

That our orchards are badly in need of spraying, is also clearly demonstrated from the statement of our chief fruit inspector, that less than 10 per cent. of the total apple crop of Ontario last year graded as No. 1, and the year before not more than 30 per cent. Yet, in contrast to this, we have seen well-sprayed orchards this year that graded at least 75 per cent. of No. 1 apples, and we have been informed of others that went as high as 80 per cent., or even higher.

REASONS FOR SPRAYING.

There are three great reasons for spraying:

1. To keep the trees healthy and vigorous, so that they may live longer and bear better.

2. To prevent the fruit from falling off the trees prematurely.

3. To keep the fruit tree from injury by either insects or fungous diseases, so that it may grade high and bring a high price.

We shall now briefly discuss these three points.

HOW SPRAYING HELPS TO KEEP TREES HEALTHY AND VIGOROUS.

In addition to the insects and diseases that attack the fruit, we find that there are also present insects and diseases that attack the trunk, branches and leaves of the trees. San Jose scale is found in hundreds of our orchards, from Sarnia to Hamilton; oyster-shell scale is present in almost every unsprayed orchard; blister mite, during the last few years, has spread to numerous orchards in almost every county, and is constantly increasing; bud-moth, case-bearers, canker-worms and several other biting or sucking insects are always more or less prevalent. Some of these, such as the scale insects, by attaching themselves to the bark of the trunk and branches, cause a great drain upon the strength of the tree, and sometimes even kill it. Blister mite and other leaf-injuring insects weaken the trees