

the churn. The churns cannot be gotten at with a brush, and we have to depend on the action of the water sliding along on the wood, while the churn revolves. When we stop to think, this is a very poor scrubbing indeed that a churn gets. We can help some with a brush, as far as we can reach into the churn, but at that we cannot get at over half the inside of a churn, so the other half always remains untouched by the brush.

How much washing do both ends of a churn get? Still less than the rest, because the water does not roll over the ends, as it does over the staves. Unless we have a churn nearly half full of water while washing, the ends come in contact with the splashing water only from the corners, corresponding to the depth of the water in the churn.

A churn can never be kept clean and sweet by giving it one washing only. I have seen places where they first wash everything in the sink, not even rinsing in clean water. After that the sink is drained off—not washed, but simply drained, filled up again, the water heated and then carried into the churn, washing powder added sometimes and sometimes not, revolved for several minutes and then the water run off. This was all. I have looked into a churn washed in this manner, and have seen butter still sticking to the ends of it. It had started to melt, but being in the center of the churn the water never reached it, and during the short process of washing, the temperature was not raised enough to entirely melt it off.

Buying a Dairy Bull.

Mr. H. Gardner writes: Breeding is of the utmost importance, but so is the individual excellence and strength which will enable the bull to transmit the good qualities of his ancestry, and so show his prepotency in his offspring. Perhaps someone, who has been writing breeders for prices, says he cannot afford to pay for a bull to use on his dairy herd. But it seems to me the question is how can he afford not to buy, and to go on in the old way. Suppose a grade cow sired by a pure-bred bull gives but one pound per milking more than her dam, an amount so small that the milker could not notice he had it without the scales, in the 300 days of the milking season, or 600 milkings, she will give 600 pounds of milk, worth at the very lowest 75 cents per 100 pounds, or \$4.50 for the season. But a good dairy cow is milked eight seasons, and that would be \$36 for the one cow, and if the bull got but ten such it would have earned its owner \$360. But a good bull will do three times as well as this, and make three times the money for its owner.

GARDEN AND ORCHARD.

Winter-killing of Apple Trees.

Every season a large number of fruit trees are lost in the orchards of Nova Scotia. Sometimes they go singly; sometimes a large number go in one orchard, and then the subject receives more attention. Some seasons seem to be much worse than others. The spring and summer of 1904 seemed to develop particularly disastrous results. Not only were many peach trees and other of the more tender fruits destroyed, but an unusually large number of apple trees either died outright or showed symptoms of failing health. In parts of Annapolis and King's Counties a large number of young trees were lost. One grower wrote me that he had lost fifty trees out of one hundred and fifty, three years set, and that if things kept on as they had been going for the past few years there wouldn't be a young tree left in that locality. But the losses were not, by any means, confined to young trees. A great many trees fifteen, twenty or twenty-five years set were among the victims.

The writer made as careful an examination as was possible in as many cases as he could hear of, and while there were many isolated cases where trees had been injured by canker at the collar, or by some other cause, the great majority of the losses appeared due to winter-killing. As a rule, when the history of the orchard was investigated, and the treatment of the soil for the past few years ascertained, it was found that either the trees had been overfed, or else the soil had been cultivated in such a way as to induce late growth, so that the wood was not in proper condition to withstand the cold weather when it came on. In a large number of cases—in fact, in most of them—the injury dated back several years, and the winter of 1903-4 had merely finished the job begun long before.

A few specific examples of orchards will serve to illustrate the matter, and place us in better position to draw general conclusions. In a young, bearing orchard near Gaspereaux (a cut of one corner of which is shown in the illustration), the trees consisting largely of Gravensteins, a very large proportion were found to be more or less seriously affected. A careful examination of the trees which looked sickly and they were in all stages, from those whose leaves were merely a little undersized and a little lightish green to those that were practically dead—showed that the bark was dead for a greater or less part of the cir-

cumference of the trunk, the appearance of the tree varying with the amount of dead bark, and, moreover it was evident that the first injury had been done about three years before. This last point was shown by the fact that the trees had attempted to heal over the dead section. In most cases there were one or more strips of live bark connecting the roots with the upper part of the tree, and in all instances where such was the case there would be found folds of new tissue which had grown out from these strips of live bark year by year, and there would be one of these folds for each year that had elapsed since the injury occurred. In almost every case two well-defined folds were present.

Now, in the light of the foregoing, let us consider the past management of the orchard in question. For several years previous to 1901 it had been in sod, but in that year it was plowed, and after being thoroughly worked was sown to oats. In 1902 the land, after being heavily ma-



Winter-killed Tree in a Gaspereaux, N. S., Orchard

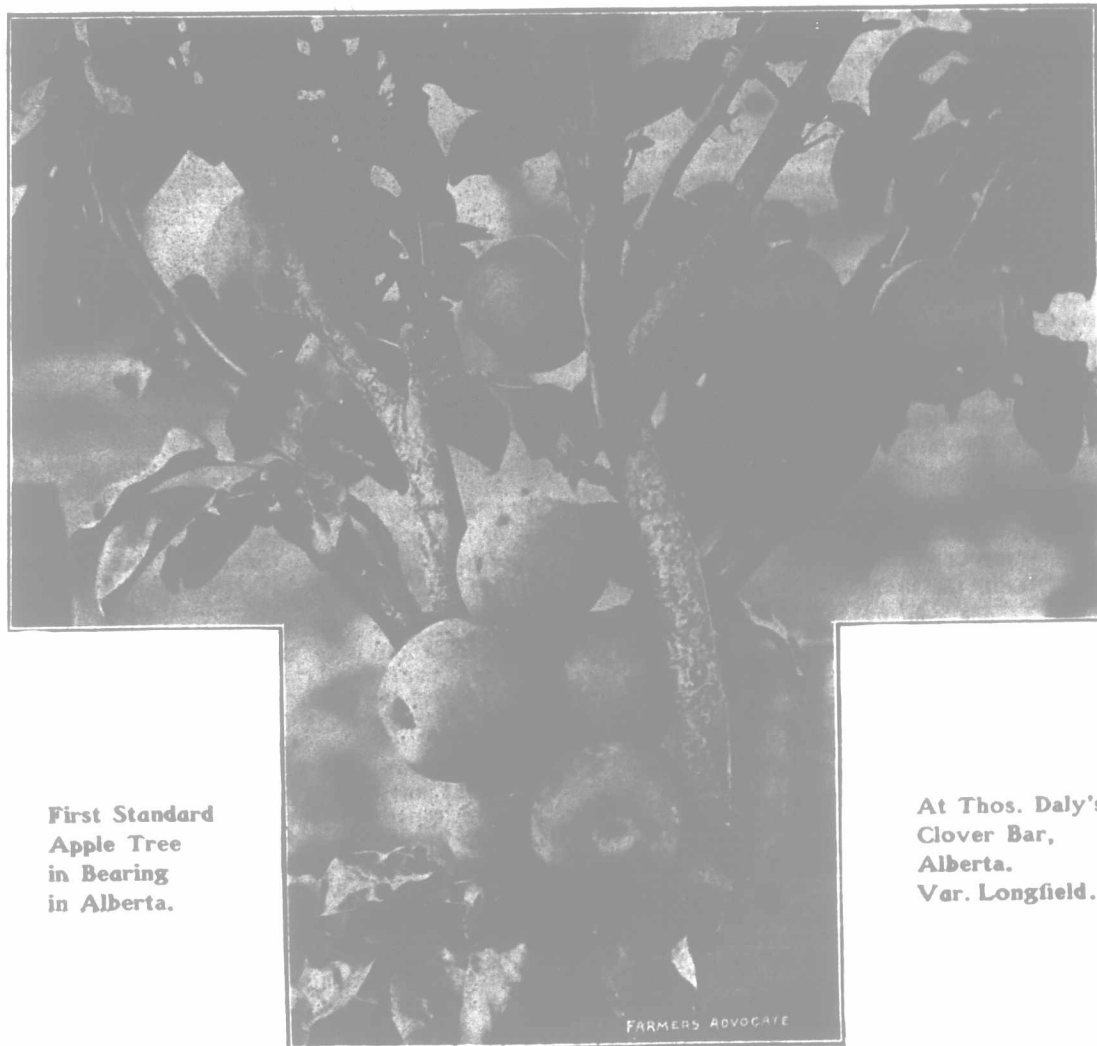
nured, was again plowed, and was planted with potatoes, which were cultivated and harvested as usual. And right here is where the danger to this orchard occurred. During the years of "sod culture" the trees, having a limited amount of plant food at their disposal, had sent their roots long distances to secure the required amount. But during this season—1902—they find themselves given a liberal helping, and find it, too, in the best condition to be largely absorbed, as the thorough cultivation of the potato field brings a large part of it into soluble form. And then, when the potatoes are dug late in the season, the trees are given another stimulus. Thus, with late cultivation and a superabundance of food, the only possible result occurs. The trees make a large growth and keep it up late, and when winter comes on the new layer of tissue between bark and wood is no more fit to withstand the cold than a cabbage would be. It

seems reasonable to me, also, that the damage would be greater under the same treatment in an orchard treated as this one had been in the past than one which was accustomed to liberal feeding and high culture from the beginning. In the first place, I think the new method would be such a complete change that the trees would be naturally upset by it, and would naturally have to adapt themselves to it. And in the second place, the roots would have spread so widely in search of the required amount of food during the years of the sod regime that when the food supply became abundant everywhere, and they had sent out their feeding rootlets throughout the extensive root system to take in this abundant food, they would secure an unusual amount of it (a great deal more than the more compact root system of well-fed trees), and the results would be proportionately disastrous.

A second case was a large orchard in Cornwallis of about the same age as the one referred to above. Here, also, the damage was principally confined to the Gravenstein variety (which fact is due, I think, to its being a rank feeder, and, consequently, particularly liable to overeat), and though the actual mortality was less, yet the whole orchard looked unthrifty. The treatment of the soil had been much like the other case. For a number of years no fertilizer had been applied, the strips along the tree rows being simply cultivated in the early part of the season and then sown to buckwheat, while the land between was sown to grain or other crops. But in 1900 the orchard received an application of barn manure and was planted to potatoes, since which time it has received the former treatment of cultivation and cover crops. The result was practically the same as in the Gaspereaux orchard. The trees made an unusual growth the potato year, and were not sufficiently matured to withstand the cold weather when it came; and, although the mortality was not so great as in the other case (largely, I believe, because the change in treatment was less radical), still some trees did die, and the whole orchard looked unthrifty. Other orchards might be cited showing similar results.

It seems to me beyond question that such injuries are due to overstimulation—to too much growth. Of course, deaths occur from many other causes, but not of so many trees at a time, and I am satisfied, as I have said, that these injurious effects will be greater in orchards in proportion as the change in the treatment is greater.

Now, what can be done to remedy or prevent such disasters? It is quite evident that, if my diagnosis of the cases is correct, the method of preventing the injury would lie in getting the trees always in a perfectly dormant condition for winter. This could be accomplished in three ways: First, by giving less fertilizer, especially barn manure; second, by ceasing cultivation earlier; and, third, by sowing a rank-growing corn crop, and sowing it earlier. Not all three would probably be needed at the same time, but they would be more likely to be in heavy lands, especially if not well drained, as these are the



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