

The "Silver Leaf" Disease of Trees.

Editor "The Farmer's Advocate":

As the name indicates, the Silver Leaf disease may be recognized by a silvery or milky gloss on the upper surface of the leaves of apples, plums, peaches, cherries, pears, currants and gooseberries. In this country, authentic cases have only occurred on apples and plums, but in Europe this disease has often been found in the other kinds of fruits. It is somewhat difficult to recognize the silvery appearance of the leaves, which, however, may become so pronounced as to completely whiten with a kind of bluish-white tinge, the foliage of one or more limbs, or often the whole tree. The present use of sprays, like Bordeaux or lime-sulphur results in the covering of the leaves with a bluish or yellowish-white film, and this may give the tree an appearance not unlike "Silver Leaf," but, on wiping the leaves, this covering is, of course, easily removed, while in the real "Silver Leaf" the color will remain. Hence, it is important to distinguish carefully between these two facts, and, in order to be sure of the disease, specimens will gladly be examined and reported upon by the Division of Botany, Central Experimental Farm, Ottawa. Growers should, however, try to become familiar with the appearance of this disease, which is by no means a new trouble in this country, but which has, unfortunately, escaped detection, until the discovery of undoubted cases of "Silver Leaf" in Nova Scotia a few months after taking up my duties here. No doubt every reader is familiar with the silvery foliage of some of our native willows and poplars. From a distance, these trees may easily be recognized on account of the bluish-white appearance of their foliage. If you bear in mind the appearance of this color when examining your orchards, and if not due to any milky film of sprays, there exists the probability of the presence of the "Silver Leaf" disease. I again solicit samples of foliage, for we cannot be too careful in taking every possible step to prevent this disease from becoming a source of real danger to one of the country's most important industries.

NATURE OF THE DISEASE.

The "Silver Leaf" is injurious to the life of the trees that have been enumerated. The trees may at first show only one limb affected; gradually another limb falls a victim, until the whole tree becomes involved. The disease works slowly, and it may take from three to five years before the disease has involved a whole tree. This depends, naturally, upon the size of the tree. During the first few years the affected branches may bear fruit, but bearing soon becomes a thing of the past, and the tree dies, limb after limb. It may be said that a tree, once attacked, nearly always dies; and, as it is our experience that it bears little fruit previous, protection practically amounts to immediate destruction of the trees which show this disease.

CAUSE OF DISEASE.

The cause of "Silver Leaf" in fruit trees has been very much discussed in England, and one of the foremost mycologists of England firmly disputes any disease "theory." His evidence in favor of a physiological disturbance, however, is, in the face of repeated and successful inoculation experiments, of very little, not to say of the slightest importance. It is very likely that, as in many other diseases, there exists in this case, too, predisposing factors which may be of physiological nature, which render the tree more liable to contract the disease, but there exists in my mind, and in that of many careful and reliable investigators (Percival, Pickering, etc.), little doubt that "Silver Leaf" has been due to an infection with *Stereum purpureum*. This fungus I have found associated with this disease everywhere where I have traced this disease. Moreover, reports from other countries (New Zealand, South Africa, etc.) also show that this species of *Stereum* is always found where "Silver Leaf" trees exist. Again, in this country I repeated the inoculation last November, and every tree thus inoculated now shows "Silver Leaf" quite plainly. Trees inoculated with another fungus which frequently dead wood of fruit trees, and check trees made with inoculation cut made with a sterile knife, and, finally, those growing in the same row; but, where no wound of any kind was made, remained perfectly free from "Silver Leaf" disease.

WARNING TO GROWERS.

"Silver Leaf" disease has been recorded and has been personally observed in the following Provinces: Ontario (Ottawa only), Nova Scotia (several records), New Brunswick, British Columbia, and experimental orchards in Manitoba. No case has yet been recorded from Quebec, Niagara

District, or any of the other Provinces where fruit is grown. This must not be taken as an indication of its non-existence. I have reason to believe that the disease is very widely spread.

The Disease is Very Serious.—Growers in this country are advised to examine their trees very carefully, and give the disease no chance of establishing itself firmly all over the country. The fruit industry is in real danger. Without wishing to be an alarmist, we cannot afford to neglect the lessons taught by the disease in other countries, and every fruit-grower should unite with the Department in the efforts which are now being made to arrest and control the spread of "Silver Leaf."

PRECAUTIONS.

Stereum purpureum, the fungus which causes "Silver Leaf" is a wound parasite. The fungus is liable to gain entrance through any wound in the bark or root. It produces its fructification on dead wood only, hence its true nature has not been at once recognized. The fructification appears as more or less large, depressed or horizontal brackets of a dull crimson color. Remove at once all trees that are wholly involved; do not allow the stump to remain in the ground. It is generally on the stump, in, or lying on the ground, where the fructification of the fungus is produced. The whole wood of any "Silver Leaf" tree should be destroyed by fire. Take the tree out any time before fall; in fall, the fructification appears more generally. Cut and burn any silver-leaved branches, and watch the tree. If, after cutting away a branch, "Silver Leaf" appears in others, haul the tree out. When removing a tree, the roots also should be dug out, then fill in the hole with stone lime mixed with soil, and allow three months before planting another tree in its place. Local infections of single limbs may take place, and the inoculation experiments have shown that such a limb may recover, but it is best to remove an infected limb as soon as noticed. The disease is liable to spread from limb to limb, so do not take any risks.

W. T. GUSSOW, Dom. Botanist.

Central Experimental Farm.

Pruning Raspberries.

The old wood should now be cut out of the raspberries, so as to give all the strength of the root system to the young canes for next year's crop. Much of this has already died, perishing immediately upon the picking of the berries. This is caused by the exhaustion of maturing a full crop and the stronger drain of the young canes, which are growing very rapidly now. Their long, thrifty canes are pushing their way across the middles, and threatening to soon block the passage of the cultivator. Means must be taken to prevent such a result, for, with upspringing weeds, it is impossible to safely discontinue cultivation; but even without the menace of the weeds, the vigorous growth of the young canes must be maintained without check, and this requires that no surface crust be allowed to form to cut off the supply of oxygen from the roots, and the bacteria of the soil that tirelessly manufacture plant food into available form.—[Market-growers' Journal.

Fruit Crop Report.

The report issued August 2nd, 1911, by P. W. Hodgkiss, secretary of the Ontario Fruit-growers' Association, shows that a very considerable amount of damage to the crop has resulted from the storms, particularly, heavy wind and hail storms, which several of the districts have lately experienced. The estimated loss from this cause, by districts, is as follows; Milton, 10 per cent. of the apples; Lambton, 20 per cent. of the apples, and a smaller percentage of plums and pears; Jordan, winter apples 10 per cent., summer apples 30 per cent., pears 20 per cent., plums 10 per cent., and grapes 5 per cent.; Georgetown, 33 per cent. of all varieties excepting Spies; New York State, 25 per cent. loss in all counties bordering on the lake; St. Catharines, very little damage reported; Chatham, no damage reported, and the crop of summer and fall fruit fair, with winter fruit light; Huron, apples are badly blown off by recent storms; Brant, 30 per cent. of the Greenings are on the ground, and other varieties have suffered badly; Forest, 25 per cent. of the apples, plums and pears were blown off; Sparta, apples are marked by hail to some extent, and many blown off; Oxford only lost about 5 per cent. by wind, and the crop is improving; Simcoe, much havoc by wind, but enough are still left to mature properly; Gore, ten per cent. of the crop down; Prince Edward, no hail, but 5 per cent. of the apples are blown down; Owen Sound, the loss from wind is about 33 per cent.; Jordan, from 50 to 75 per cent. of the fruit in this section was completely destroyed

by hail on July 23rd; Port Burwell, about 30 per cent. of the apples have been blown off. Wentworth reports a loss of 10 per cent.

Nova Scotia still reports a bumper crop. It is estimated at over one million barrels. Apples are still looking well in sprayed orchards, while some districts report that fully 75 per cent. of the fruit in unsprayed orchards is affected with the codling moth and curculio.

Summer apples are reported as selling for from \$1.00 to \$1.25 per barrel, while buyers in Prince Edward Island have offered \$2.50 to \$2.75 per barrel, f.o.b., station, for fall and winter fruit.

Experiments With Tomatoes.

Editor "The Farmer's Advocate":

During the season of 1910, at Cambridge, New Brunswick, a series of experiments were conducted by the writer with tomatoes, under field conditions. The object was to determine how best to combat the leaf-spot of tomatoes, and also the cracking of the ripening fruit. A study was also made of any advantages or disadvantages which might arise from the different methods of pruning and staking the vines. Four Earliana plants were used in each experiment.

It was shown that leaf-spot can be controlled by the use of Bordeaux mixture. There is no one application which is all-important, freedom from disease being, with slight variation, proportional to the number of sprays. The application of Bordeaux immediately after plants are transplanted to the open field is not to be recommended. In every case, plants were much injured by its use when this was done, and their recovery from same was slow.

The advantage was with the staked plants. Especially was it noticeable in plot 12, where plants were kept from the ground by means of stakes placed over plants in camp style. Leaf-spot can be controlled by Bordeaux, but if early ripe fruit is wanted, it does not pay to do so. Any check to the plant tends to ripen its fruit. Leaf-spot tends to produce that check, and consequent ripening. The best prices for tomatoes are always obtained in early season. The combining of these two factors, viz., early ripening, and consequent better prices, gave to the unsprayed plot the advantage in ripe fruit, by the end of the season, of 48¢ cents. If we should add the cost of spray and its application to sprayed plot, the difference would be still greater.

In any locality where the season is long and quantity of fruit is the only consideration, spraying would pay, but not otherwise, with the possible one exception of spraying before plants go in the field. The same conclusion may be drawn from results obtained from plots where vines were kept from the ground. There was less leaf-spot, but the fruit was later. Two plots which were covered with canvas, for another purpose, remained green until the end of the season. This would indicate that in dry seasons you would expect less "spot" than during wet ones. This is amply borne out in the field, for in wet seasons plants are often entirely defoliated.

The exceeding wet weather interfered somewhat with the experiments re "cracking," but both field and plot showed that continuous wet weather would not produce this condition. Field and plot showed that wet weather, followed by dry, would not cause it, for under such conditions good fruit was obtained free from blemishes. On the other hand, wet weather following dry would crack the fruit quickly. The experiments seem to prove only one thing, that cracking is caused by rapid growth of fruit, brought on by wet conditions following dry.

The application of common salt in different quantities did not lessen cracking; in fact, it seemed to increase it. We had hoped that, as salt checks growth, we might be able to hold back on the subsequent growth caused by late rains, and thus prevent cracking. Following rain, the interior of the tomato grows faster than the skin, and cracking is the result. Some practical remedy for this, which annually brings much loss to the grower, must yet be sought. The picking of the fruit green, and ripening same in a cool, dry, dark room, is the only effective method of dealing with the difficulty. The flavor of fruit thus ripened is somewhat impaired, but in some seasons it is the only method of saving the crop.

The effect of pruning was studied in three plots. It is noteworthy that plot 15, which was not pruned, produced almost exactly as much fruit as 13 and 14 together, one of which had all laterals removed, and the other shortened. In the case of plot 13, where all laterals were removed, fruit was no earlier, and much less of it. This practice is strongly to be condemned. The shortening of all laterals had little effect. There was nothing gained sufficient to warrant its being done. Ripe fruit seemed to be produced a little earlier than in plot 15, but no earlier than in some others left unpruned.

Macdonald College.

E. M. S.