

Fungous Diseases of Ontario Orchards: Pear Blight

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THE well known bacterial pear blight caused by a tiny bacillus is one of the most prominent orchard diseases in Ontario. It attacks particularly the pear and the apple, but also affects the quince, the Siberian crab apple, the wild crab apple, the hawthorns, and practically all the fruits of the pome family. The germs producing the disease enter the tree in three different ways: First and most commonly, through the blossoms, being distributed from flower to flower and tree to tree very widely through bees and other flower visiting insects; second, through tender tips of growing shoots, including the water sprouts at the bases of the trees; and third, directly into the fleshy bark. Infections of this latter type are few in number but result in a very serious form of the blight. The amount of damage resulting from an infection may vary enormously. Thousands of infections simply kill the blossom cluster or a few inches of the tip of a growing twig. On the other hand the blight may run down on to large branches or run clear to the ground, killing the whole tree, or it may spread from a lateral infection, doing more or less damage. The spread of the disease, the number of infections and the amount of extension of the blight on a tree after infection are dependent upon a number of different conditions. The factors controlling an outbreak of pear blight may be summed up as follows:

First.—The presence of the germ and the amount of holdover blight available for reinfection.

Second.—The amount of bloom on the trees. It is difficult for young orchards to catch pear blight until they blossom.

Third.—The number of insect visitors available. This is largely, however, constant if the next is favorable.

Fourth.—The weather during blossoming time. If the weather is favorable for insect activity and nectar secretion, the blight germs are generally carried about. On the other hand rainy weather or cold dry sunny weather discourages the spread of blossom blight.

Fifth.—The variety and species of the tree. Each different horticultural variety and each species of pomaceous fruit has a different relative resistance to the disease.

Sixth.—The age of the tree. Young trees are more susceptible than older ones. The most susceptible age comes at the time the trees are first in bearing, say the first four or five years they are in bearing.

Seventh.—The vigor of growth. This is influenced by fertility of the soil, soil

moisture conditions, favorable weather, artificial manuring, fertilizing and cultivation. In general, those conditions most favorable to vigor of growth of the tree are most favorable to the blight, and conversely those influences which dwarf or check the growth of the tree tend to hinder the progress of the blight.

Most of the blight dries out in the trees during the summer. On the other hand, occasionally at the bases of the blighted twigs or more commonly on the thick, fleshy bark on the large limbs and on the bodies of the trees, the blight keeps slowly progressing until the close of the season. The germs die out of the dead bark but keep alive on this advancing margin and the cool, moist weather of winter, though it checks their growth, tends to keep them alive until spring. This type of blight we call "holdover blight" and is the source of the new infections each season when the trees spring into growth.

COLLAR BLIGHT

I wish to call particular attention to the forms of pear blight known as body blight and collar blight. Body blight occurs abundantly on young trees, more particularly on young Bartlett and other pear trees, but it may even kill young apple trees. Frequently the blight gets into the thick fleshy bark on the body of young trees either by running in through a fruit spur or water sprout or by means of the punctures of insects or mechanical injuries. Possibly the germs may enter directly into the fleshy bark through growth cracks. Once in the fleshy bark the germs rapidly spread in all directions. They extend vertically in the direction of the vessels and fibres more readily than they do laterally. Oftentimes the infection is at the ground line or at the collar of the tree. Sometimes even below the soil line. The blight then spreads on the moist soil in all directions. Below the soil it more readily spreads in a lateral direction around the collar and down the bark of the roots. Frequently large irregular areas are formed and quite often they girdle the trees, absolutely killing them. Sometimes a V-shaped area runs up from the point of infection on to the body. French stocks are often more susceptible to blight than the grafted top even though the latter may be the susceptible Bartlett.

Trees affected with body blight usually take a year to die. This is unlike the branches, which are, of course, killed by the blight of the current season. Trees often live another year, and sometimes a second, even though completely girdled, and show the destructive effects the sea-

son after the blight has done its work. Sometimes the blight germs have died entirely out of the bark and the dead bark has dried up and yet the tree dies the following year from girdling.

In case of collar blight, where it does not completely girdle the tree, the tree often takes two or more years to die, but finally does so from the girdling. A small amount of blight at the collar or around the body does the maximum amount of injury.

This type of blight may be regarded as the most injurious and more trees are killed by this form as a rule than from blight in the top. It is also the hardest for the orchardist or inspector to find. However, it produces one very striking symptom that often leads to its detection. The foliage on these girdled trees, or even on the particular side of the tree attacked, begins to take the reddish autumnal color from midsummer on. In walking through the orchard after the first of August these reddish trees or reddish parts of trees are usually distinguishable from a distance. These premature reddened or bronzed leaves often contrast very strongly with the normal dark green foliage. This is particularly true of well-kept orchards. The reddening of the foliage is not always an infallible guide as sometimes branches color their leaves red from other diseases, root troubles, girdling by mice, and unknown causes. On examining these reddened trees, however, the blighted area can usually be found.

At least two types of frost injury also very closely resemble pear blight at the collar. In one of these the tree is injured from the soil line upward, usually on the sunny side but not always so. Blight is easily distinguished from this winter sun scald when the latter occurs as an elliptical are on the main trunk of the tree from the soil or snow line nearly to the branches. On the other hand, another type of frost collar girdle reaches but a little above the soil line or only occasionally extends upward in a V-shaped area but spreads well under the ground, partially or wholly girdling the tree. Still another type is that of root winter killing. In this case the roots near the surface of the ground are frozen and killed, while the top of the tree may or may not be injured by frost. It is necessary to know these other collar injuries in order to distinguish them from true collar blight.

(To be Continued in Next Issue)

Photographs of pruning and spraying scenes are requested for publication in THE CANADIAN HORTICULTURIST.