



Fireblight of Apples

By
Harry A. Graves
Extension Horticulturist

and

W. E. Brentzel
Plant Pathologist
Experiment Station



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FIREBLIGHT OF APPLES

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Fireblight is perhaps the most destructive disease of the apple tree in North Dakota. Young, thrifty growing trees are especially susceptible. They often become infected soon after the first blooming season.

Considerable damage often follows the first season of the infection. When a tree becomes diseased the blight will appear each year, becoming progressively more damaging. Susceptible varieties may be killed completely within 3 or 4 years.

Causes of Fireblight

Fireblight is caused by a bacterium which thrives in the inner layer of the bark of apple trees, usually beginning with an early infection of the flowers and tender shoots.

After infection sets in, a milky substance oozes from the infected parts in which the bacteria are actively growing and developing. These milky drops contain millions of bacteria which are spread about by insects or by other means to healthy parts of the tree and to other trees. There they reproduce the disease.

Insects visiting the flower may carry the bacteria, or rain may splash the bacteria onto healthy parts of the tree, thus setting up new infections.

How to Recognize Fireblight

The name of the disease, "fire-blight," describes it very well. Early in the spring as the disease begins to develop, the young shoots and branches appear as if scorched by fire. This takes place soon after the flower petals fall. Before the leaf blight develops, the flowers turn brown and the blight extends down the flower stems and into the leaves on the fruit spurs.

Later, as the blight develops, the bacteria move through the fruit spurs and water sprouts (suckers), if present, and into the larger branches. The tips of the new growth show the blighting and become very plainly diseased. After the blight develops, the leaves cling to the tree for a long



A DORMANT FIRE-BLIGHT
CANKER IN NOVEMBER

time and appear very dark brown in color. These are the symptoms of the blight the first year.

Fireblight cankers develop at the end of the growing season and serve to carry the bacteria through into the next year. The cankers are slightly sunken areas of various sizes on the branches of the tree. The bark under the cankers is firmly attached to the wood and does not loosen. In the spring bacteria in the cankers develop a brownish colored substance on the surface, especially along the margins. As the season develops, the bacteria increase in number and form milky drops, containing millions of bacteria. These bacteria may continue to develop beneath the bark and enlarge the canker. Some may be carried to other parts of the tree by insects or other agents.

When a tree once becomes infected, it seldom recovers from the attack of fireblight. However, it may live on for some years, depending upon its susceptibility to the disease.

How to Control Fireblight

A few varieties seem to have some resistance to fireblight. Dolgo crab and Northwest Greening seem to have some resistance, while the Transcendent crab, Wealthy and most of the other kinds are susceptible. Since the most preferred varieties of apple are susceptible to fireblight, some kind of preventive program should be used.

Preventive measures are much more effective than eradication after the blight has begun. For this reason, keep a careful watch on developments throughout the growing season. If you find only a few blighted branches break them off at once, 8 to 10 inches below the deadwood, to make sure that all of the bacteria are removed. It is better to break the branch than to cut it, because the cutting knife may carry the bacteria to healthy wood. Also, a careful watch should be made of the water sprouts or suckers which grow from the trunk or base of the tree. These sprouts are succulent and very susceptible to blight. Because the sprouts come from the trunk or larger branches of the tree, the bacteria quickly reach the base and spread the disease to the trunk where

it is most difficult to eradicate. Remove water sprouts as soon as you see them whether they are blighted or not.

There appears to be no effective spray which will control fireblight unless used in conjunction with pruning. It is often noted that fireblight comes in two distinct periods of time: First, soon after the flowers have gone, and again 4 or 5 weeks later. These later infections are thought to spring from cankers on the large limbs or trunk of the tree.

For the most part, pruning should be confined to the dormant period of the tree to prevent spreading bacteria by means of the cutting knife. It is not likely that you will be able to find all the cankers on infected trees. However, make a careful search and remove all you can find. Cankers are best removed with a knife by slicing through the dead wood, and cutting out all discolored tissues. After removing all the infected material, treat the wounds with a suitable disinfectant such as described in this circular. When cutting out cankers make an oblong wound, pointed at both ends. This produces a scar that heals better than that of other shapes. If you find small cankers encircling the limbs more than half way around, remove the entire branch. Treat all cut surfaces with the disinfecting solution, applied with a paint brush.



Disinfecting Solution

Cutting tools, and wounds made with them, should be disinfected. The tools may be dipped into the solution between each cut made in removing branches and cankers. The following solution is recommended:

Mercuric chloride (Corrosive sublimate)	1/8 ounce
Mercuric cyanide	1/8 ounce
Distilled water or rainwater	2 quarts
Glycerine	8 ounces

THIS SOLUTION IS POISONOUS. KEEP IT AWAY FROM CHILDREN AND ANIMALS. HANDLE IT WITH CARE.

Spray Program

Sprays used in combination with pruning are recommended for control of fireblight. Two kinds of sprays are used:



1. A spray containing Bordeaux mixture or basic copper sulfate.

2. Antibiotic sprays.

Basic Copper Spray - Bordeaux mixture is somewhat difficult to prepare. A suitable substitute is one of the basic copper sulfates containing from 50 to 53 percent copper. A number of different brands of this material are on the market, such as Microgel, Copper King and Tennessee Basic Copper. Mix the basic copper sulfate compounds at the rate of $\frac{1}{2}$ pound per 100 gallons of spray:

1. Spray the trees in full bloom.
2. Spray 10 days later, or sooner if rains occur.
3. Spray 10 days after second spraying. In rainy weather keep the trees covered as much as possible during the blooming period.

Antibiotic Spray - A new spray containing the antibiotics streptomycin and a small amount of

terramycin in combination is reported to be very effective for control of fireblight. A ready prepared mixture is available, known as Agrimycin 100.

- (1) Apply Agrimycin (prepared as recommended on the container, when 20 to 30 percent of the flowers are open.

- (2) Repeat the spray 5 days later.

- (3) Spray again 5 days after the second spray.

Effective control of Fireblight is possible through careful pruning and spraying, if you begin before the blight becomes too far advanced.

In all cases it is most important that the blight be detected in its early stages of development and that protective measures be started immediately. After most of the branches of a tree are infected there is little hope of saving it. In most cases it is better to remove the tree, including the roots, and start a new one in its place.

**Other Publications of Interest
To Fruit Growers**

NDAC EXTENSION SERVICE

Circular No. A214 -- Fruit Varieties for North Dakota
Circular No. A75 -- Currants and Gooseberries
Circular No. A16 -- Strawberries
Circular No. A38 -- Raspberries

U. S. DEPT. OF AGRICULTURE

Leaflet No. 407 -- Dwarf Fruit Trees
Leaflet No. 406 -- Apple Bitter Rot
Leaflet No. 222 -- The Home Fruit Garden

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