Fire Blight of Fruit Trees

Fire blight is one of the most devastating and difficult-to-control diseases of many fruit trees including apple and pear, and other rosaceous ornamental plants. Caused by a bacterium (*Erwinia amylovora*), it can spread rapidly, killing individual apple and pear trees when conditions are right for disease development and susceptible root stocks are used.

**Symptoms**

The first symptoms of fire blight occur in early spring, when temperatures are above 60 °F and the weather is rainy or humid. Infected flowers turn black and die. The disease moves down the branch, resulting in death of young twigs, which blacken and curl over, giving the appearance of a "shepherd’s crook." Leaves on affected branches wilt, blacken and remain attached to the plant, giving it a fire-scorched appearance. Slightly sunken areas, called cankers, appear on branches and the main stem. Many parts of the plant can be affected including blossoms, stems, leaves and fruit. During wet spring weather you may notice a milky-like, sticky liquid oozing from infected plant parts. Insects and rain can spread the disease.

**Plants Commonly Affected**

In the home garden, fire blight can be very destructive to apple and pear trees. Pear trees are particularly susceptible. Some ornamental pear trees, such as ‘Bradford,’ are considered resistant to the disease but can become infected when conditions are favorable for disease development. Certain plants in the rose family (Rosaceae), including many ornamental plants, can be affected by fire blight. Some of these include crabapple, pyracantha, cotoneaster, hawthorn, photinia, quince, mountain ash, loquat and spirea.

**Prevention & Treatment**

There is no cure for fire blight, making disease prevention extremely important. Controls for fire blight include selecting tolerant varieties; using recommended cultural practices and sanitation measures; and applying insecticides and bactericides. Although these methods are not 100 percent effective, they help reduce disease severity.

**Recommended Varieties:** Cultivars should be selected that are less susceptible to fire blight, and suitable for planting in South Carolina.

Apple varieties that are moderately resistant to fire blight include:

- ‘Arkansas Black’
- ‘Empire’
- ‘Enterprise’
Ornamental pear varieties that are moderately resistant to fire blight include:

- ‘Bradford’
- ‘Capital’
- ‘Cleveland Select’
- ‘Whitehouse’

‘Bradford’ is the most resistant of these varieties.

Moderately resistant edible pears include

- ‘Ayers’
- ‘Keiffer’
- ‘LeConte’
- ‘Moonglow’
- ‘Magness’
- ‘Orient’
- ‘Seckel’ (somewhat resistant)

Asian pears that have some resistance to fire blight include:

- ‘Chojuro’
- ‘Hosui’ (somewhat resistant)
- ‘Seuri’
- ‘Shinko’

Crabapples with moderate resistance to fire blight include:

- ‘Adams’
- ‘Donald Wyman’
- ‘Pink Princess’
- ‘Red Barron’ (somewhat resistant)
- ‘Robinson’
- ‘Prairiefire’
- ‘Profusion’
- ‘Sugar Tyme’ (somewhat resistant)
- ‘Velvet Pillar’

Cultural Practices & Sanitation Measures:
Reduce the spread of fire blight by removing and destroying all infected plant parts. Pruning cuts should be made a minimum of 8 to 12 inches below any sign of infected tissue. Dispose of all infected prunings. Disinfect all pruning tools between cuts using a solution of 1 part household bleach to 9 parts water. Succulent new growth is easily infected, if injured. Avoid excess nitrogen fertilization which results in excess succulent growth. Remove all suckers coming up from the base of the trees, as these are more susceptible to fire blight infection, which can then move rapidly to the trunk.

Insecticides & Bactericides: Bacteria enter the plant through blossoms, fresh wounds or natural openings. The disease is spread by rain and insects attracted to the bacterial ooze, such as bees, ants, flies, aphids and beetles. These insects inadvertently carry the bacteria to opening blossoms. Control of insects can reduce the spread of bacteria and the occurrence of infections. During bloom, honey bees can carry the fire blight bacteria during pollination. However, do not use insecticides during bloom.

Apples: If fire blight has been severe the previous year, then one spray of a copper fungicide should be applied immediately prior to bloom. Be sure to make a thorough coverage of all branches and spurs. This will reduce the amount of bacterial inoculum present and reduce disease development. See Table 1 for copper fungicide products. Follow label directions for mixing and application.

The recommended bloom spray bactericide for susceptible apple trees is streptomycin, which should be first sprayed at the beginning of bloom and repeated every 3 to 4 days as long as flowers are present. Streptomycin is used as a preventative treatment only, and stops the fire blight bacterium from entering the blooms and starting infections. The time between streptomycin application and fruit harvest must be a minimum of 50 days. See Table 1 for streptomycin products. Mix and apply all chemicals according to directions on the label.

Pears: Pear trees can also be treated with a pre-bloom, copper fungicide spray and sprays of streptomycin during bloom. Apply the first spray with streptomycin as soon as the flowers open. Repeat at 3 to 4 day intervals as long as blossoms are present. The time between streptomycin application and fruit harvest must be a minimum of 50 days. See Table 1 for copper fungicides and
streptomycin products. Mix and apply all chemicals according to directions on the label.

**Crabapple:** Crabapple trees can be treated with a copper fungicide may be applied before and after bloom to reduce bacterial inoculum on the exterior of twigs and spurs. If applied during bloom, however, it will cause russetting on the fruit and possibly fruit abortion. Streptomycin may be applied during bloom. Apply the first spray with streptomycin as soon as the flowers open. Repeat at 3 to 4 day intervals as long as blossoms are present. Do not use streptomycin once fruit is visible. Mix and apply all chemicals according to directions on the label.

**NOTE:** Control of diseases and insects on large trees is usually not feasible, since adequate coverage of the foliage with a pesticide cannot be achieved.

<table>
<thead>
<tr>
<th>Pesticide Active Ingredient</th>
<th>Examples of Brand Names &amp; Products</th>
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<tbody>
<tr>
<td>Copper Fungicides</td>
<td>Bonide Copper Fungicide (copper sulfate)</td>
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<td></td>
<td>Lilly Miller Kop-R-Spray Concentrate (a copper ammonium complex)</td>
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<td></td>
<td>Monterey Liqui-Cop Fungicide Concentrate (a copper ammonium complex)</td>
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<tr>
<td></td>
<td>Southern Ag Liquid Copper Fungicide (a copper ammonium complex)</td>
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<tr>
<td>Streptomycin</td>
<td>Ferti-lome Fire Blight Spray</td>
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Table 1. Fungicides Labeled for Fire Blight Control on Apples, Pears, & Crabapples in the Home Orchard.

Note: The copper sulfate and copper ammonium complex fungicides listed have more metallic copper per volume (7 to 8% metallic copper) than do copper soap fungicides (1.8% metallic copper), and therefore may give better control of bacterial inoculum during pre-bloom sprays of the twigs and spurs.

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