

IPM Fact Sheet Series**UMass Extension Fruit Team**

Fact Sheet #AD-004

Apple - Fire Blight (*Erwinia amylovora*)**Overview**

- Fire blight (FB) is caused by the bacterium *Erwinia amylovora*. Outbreaks in New England are sporadic, but have become more common in recent years.
- Infection of blossoms occurs during warm weather in conjunction with wetting events. Bacteria then migrate through the vascular tissue to the growing shoots and rootstocks killing tissue and whole trees.
- Fire blight management is a combination of tactics applied every year.
- Sanitation is accomplished by removing blighted shoots and whole trees.
- Chemical control begins with a copper spray at silver tip to green tip. Monitor weather data and use a forecast model to determine the need for antibiotics and biopesticides at bloom. Applications of Apogee or Kudos for shoot blight may be made during active shoot growth.

Symptoms

Fire blight is a destructive disease of apples and pears that affects blossoms, fruits, shoots, and limbs. Infection in some cases can lead to tree death. Varieties differ in their susceptibility to Fire Blight. As the pathogen progresses in its host, the tissue blackens, appearing as if burned. Affected vegetative shoots wilt, causing the distinctive shepherd's crook appearance.

The disease may kill entire trees. This is especially true for high density plantings as these trees tend to be smaller allowing the bacteria to move rapidly through the whole plant. Fruits infected early remain small and appear shriveled, dark, and 'water soaked'. They will remain attached to the cluster. Fruits affected later are less shriveled and discolored and often ooze inoculum.



Figure 1) Left, - Fire blight killing flower cluster; Center - Infected shoot in early June; Right - Fire blight strike. (Photos: H. Faubert, Univ. of Rhode Island Extension)

Disease Cycle

The bacteria overwinter in bark tissues along the edges of cankers caused by infection in previous years. In the spring when temperatures begin to warm, the cankers exude a characteristic ooze, and the bacteria are disseminated by rain and insects to vulnerable tissues - especially open blossoms, tender vegetative shoot tips, and young leaves. The

bacteria penetrate the tree at natural openings or wounds. Secondary infection arises from ooze from fresh infections.

Management Strategies

Monitoring: As with most pathogens, monitoring for physical signs of bacteria is impractical. Instead, monitor infection risk potential using disease forecast models such as Maryblight, developed at the University of Maryland. This model measures temperature, rainfall and leaf wetness to determine the risk of blossom, canker, shoot and trauma blights. The need for chemical control depends on a combination of orchard risk factors and weather conditions during bloom. Infection is most likely to occur after 200 degree days (base 65°F) have accumulated since the first blossom has opened in the orchard.

Control Strategies

Cultural/ Biological:

- Removal of cankers during dormant pruning.
- Avoid more susceptible cultivars when planting new orchards.
- Plant on well-drained soil.
- Maintain proper orchard nutrition in order to discourage excessive tree vigor.
- Inspect orchards weekly in the summer for fresh infections and remove.
- When removing infected plant material, cut infected branches at least 12 - 18" below the lowest evidence of disease.
- When removing infected plant material during the growing season, prune only on sunny, hot days when rain is not predicted.

Chemical:

- Refer to the [New England Tree Fruit Management Guide](#) for specific materials and rates recommended for managing Fire Blight.
- Dormant to early season copper applications reduce epiphytic bacterial populations.
- Apply recommended fungicides at the green tip stage to reduce the amount of inoculum on the outer surfaces of infected trees.
- Control insect vectors in the orchard.
- Use biological control materials in conjunction with antibiotic materials to reduce resistance development.
- Apply antibiotic sprays at bloom to help prevent the disease from becoming established in an orchard.
- Avoid overuse of materials that can lead to the development of resistance in this pathogen.
- Plant growth regulators may be used to slow vegetative growth rates.

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