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FACT SHEET

Winter and Early-Season Fire Blight Management

Dr. Quan Zeng
Department of Plant Pathology and Ecology
The Connecticut Agricultural Experiment Station

Fire blight is a devastating disease of apples and pears caused by the bacterial pathogen *Erwinia amylovora*. Last year, serious fire blight was observed throughout many New England orchards. What winter / early-season management practices can be used to minimize new outbreaks in orchards for the upcoming season?

The fire blight bacterium overwinters in cankers (areas of bark killed by bacteria) formed during the previous growing season. In spring, when temperatures frequently reach 65ºF, the bacteria become active and exude from the canker surface as bacterial ooze. These sweet, gummy exudates serve as the major inoculum that causes fire blight infection in the second year.

An important aspect of fire blight management is to reduce the amount of inoculum at the beginning of the growing season. This is especially important for orchards that had outbreaks of fire blight the previous year. Winter pruning and early-season copper applications remove diseased tissues and kill bacteria formed the previous year. Removal of the disease tissues/bacteria will prevent them from causing problems the following year. Orchards that receive these practices should have significantly fewer incidences of fire blight.

A. Winter Pruning

1. What is the best time to prune?

November through March is considered a good time to prune, although the optimum pruning time is late winter (from February 1st until March 15th). During this time, trees are dormant, pathogens are not active, and the temperature is not usually cold enough to result in freeze damage.

2. What shall I remove?

Cankers are dead plant tissues killed by the bacterial pathogens in previous years. Cankers often appear as dark discolored areas that are slightly sunken, with narrow callus ridges on the surface (Figure 1).

Figure 1. Illustration of a fire blight canker (arrow). Photo taken in Hamden, CT.

When the bark is removed, the internal canker tissue often appears brown, in contrast to the greenish white color of the healthy woody tissues (Figure 2). Shoots and branches with visible cankers should be removed from healthy portions of the branch(s). Cuts should be made well into healthy tissue (at least 12 inches, or to the next branch) to ensure all infected tissue is removed. Pruning will also remove dead bark and cankers with overwintering inoculum of the black rot fungus, *Botryosphaeria obtusa*.

Figure 2. Discolored internal canker tissue (arrow) when bark is removed. Photo taken at CAES.

3. Shall I disinfect my tools?

Although disinfecting the pruning tools is a good practice (70% alcohol, or 10% bleach solution), the chance that the disease-causing bacteria can be spread by winter pruning is minimal. Bacteria are inactive in cold temperature. They will not multiply or survive on pruning tools or pruning cuts in the winter. Therefore, it is usually not necessary to disinfect pruning tools for winter pruning. A word of caution--all tools should be disinfected prior to use when removing rootstock suckers.

4. Shall I remove diseased branches from orchard floor?

Bacteria can survive and remain dormant in cankers in cold temperatures, even after the cankered branches are removed. Thus, removing diseased branches from the orchard floor is suggested following winter pruning. In summer pruning, however, it is helpful to leave the pruned branches on the orchard floor to allow them to dry out, since carrying diseased branches with active bacteria around the orchard may spread the disease.

5. Prune rootstock suckers.

Rootstock suckers are apple tree sprouts that emerge from the rootstock (Figure 3).

Figure 3. Rootstock sucker (arrow) on an apple tree. Photo taken in Hamden, CT.

They provide direct entry points for fire blight bacteria. Removal of rootstock suckers is especially important for apples that are grafted on M9 and M26 rootstocks. Alternatively, rootstock suckers can also be eliminated using applications of herbicides (such as Venue).

6. Revisit the orchard to look for cankers that were missed from the first time.

Since cankers can be easily missed during the first round of winter pruning, revisit the orchard at different times of the day to find cankers that weren't detected the first time.

B. Early-season application of copper

Copper is toxic to bacteria. Applying copper in early spring at silver tip or green tip can significantly reduce bacterial numbers on the surface of bark or buds and therefore helps to reduce the inoculum level. Since copper is also toxic to trees and can russet fruit, it should not be applied after half-inch green. Research has demonstrated that fixed copper materials (such as Cuprofix Disperss, Kocide, Champ and Nordox) work better than other forms of copper, as the fixed copper releases slower due to lower water solubility, which provides longer protection of plant surfaces against fire blight pathogens. Thorough spray coverage is necessary (100-200 gal of dilute spray mix per acre). Oil could be added (1 qt per 100 gal of actual spray solution) to increase the efficiency of copper. Copper sprays during green tip may also help with apple scab control. For more detailed management guide, please refer to the most up to date New England Tree Fruit Management Guide.

February 2015 (revised)

If your orchard has fire blight this year, please contact me—I will provide assistance with fire blight diagnosis and conduct streptomycin resistance testing of your fire blight samples.

Dr. Quan Zeng
The Connecticut Agricultural Experiment Station
Department of Plant Pathology and Ecology
123 Huntington Street, P.O. Box 1106
New Haven, CT, 06504

E-mail: Quan.Zeng@ct.gov
Phone numbers: (203) 974-8613 or (832) 671-3499