



TEXAS A&M FOREST SERVICE

Tree Health Issues

Fire Blight

Fire blight, caused by the bacterium *Erwinia amylovora*, is a common and frequently destructive disease of fruit trees and related plants. Pear (*Pyrus* species) and quince (*Cydonia*) are extremely susceptible. Apple, crabapple (*Malus* sp.), and firethorns (*Pyracantha* sp.) also are frequently damaged. Fire blight is less common on hawthorn (*Crataegus* sp.), *Spiraea*, *Cotoneaster*, toyon (*Photinia* sp.), juneberry or serviceberry (*Amelanchier* sp.), loquat (*Eriobotria*), mountain ash (*Sorbus* sp.), and other related plants. The disease can destroy limbs and even entire shrubs or trees.

IDENTIFICATION AND DAMAGE

In spring, branch and trunk canker symptoms appear as soon as trees begin active growth. The first sign is a watery, light tan bacterial ooze that exudes from cankers (small to large areas of dead bark) on branches, twigs, or trunks. The ooze turns dark after exposure to air, leaving streaks on branches or trunks. Most cankers are small and inconspicuous; thus infections might not be noticed until later in spring when flowers, shoots, and/or young fruit shrivel and blacken. The amount of fruit loss depends upon the extent and severity of the disease. Infected flowers and flower stems wilt and turn black or brown. Fire blight infections might be localized, affecting only the flowers or flower clusters, or they might extend into the twigs and branches, causing small shoots to wilt and form a crook at the end of each infected shoot.

Dead, blackened leaves and fruit cling to branches throughout the season, giving the tree a scorched appearance, hence the name "fire blight." Infections can extend into scaffold limbs, trunks, or root systems and can kill highly susceptible hosts. Less susceptible varieties might be severely disfigured. Once infected, the plant will harbor the pathogen indefinitely.

Newly infected wood underneath the bark has pink to orange-red streaks. If the bark is cut away from the edge of an active canker, reddish flecking can be seen in the wood adjacent to the canker margin. As the canker expands, the infected wood dies, turns brown, and dries out; areas of dead tissue become sunken, and cracks often develop in the bark at the edges of the canker. The pathogen tends to move in trees from the infection site toward the roots. In fall, leaves on infected pear shoots often turn red then black.



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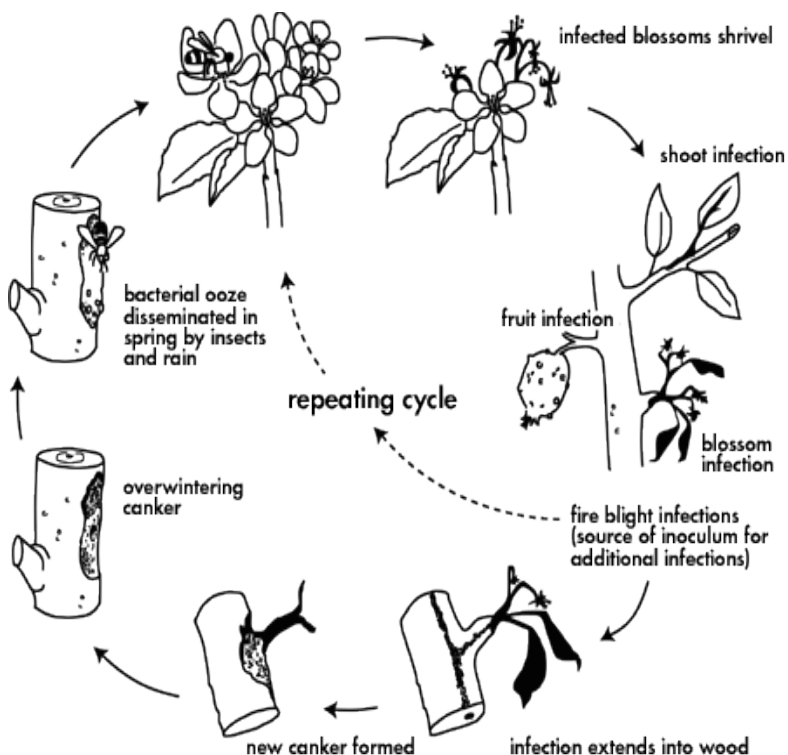
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LIFE CYCLE

Fire blight bacteria overwinter in cankers on twigs, branches, or trunks of host trees. In spring, a small percentage of the cankers become active as bacteria multiply and ooze from branch or twig surfaces. Splashing rain or insects transmit the bacteria to nearby blossoms or succulent growing shoots. Once blossoms are contaminated with the bacteria, honey bees become efficient carriers of the pathogen.

Injuries on tender young leaves and shoots, caused by wind, hail, or insect punctures, are easily invaded by the fire blight bacteria. Such infections lead to shoot blight. Ideal conditions are rainy or humid weather with daytime temps from 75° to 85°F, especially when night temps stay above 55°F.

Tree vigor has a major influence on the extent of fire blight damage. Once established, the distance the pathogen moves relates directly to the susceptibility of the tree and rate of tree growth. Vigorously growing shoots are the most severely affected; therefore, conditions such as high soil fertility and abundant soil moisture increase the severity of damage to trees. In general, trees are more susceptible when young and suffer less damage as they age.



MANAGEMENT

Fire blight development is influenced primarily by seasonal weather. When temps of 75° to 85°F are accompanied by intermittent rain or hail, conditions are ideal for disease development. The succulent tissue of rapidly growing trees is especially vulnerable; thus excess nitrogen fertilization and heavy pruning, which promote such growth, should be avoided. Trees shouldn't be irrigated during bloom.

Removing Diseased Wood Successful removal of fire blight infections is done in summer or winter when the bacteria is no longer spreading through the tree. At these times cleaning pruning shears is unnecessary. Rapidly advancing infections on very susceptible trees should be removed as soon as they appear in spring. In these cases, dip shears in 10% bleach between cuts. However, the location of the cut is far more important than the cleansing of tools. To locate the correct cutting site, find the lower edge of the visible infection in the branch, trace that infected branch back to its point of attachment, and cut at the next branch juncture down without harming the branch collar.

If a fire blight infection occurs on a trunk or major limb, the wood often can be saved by scraping off the bark down to the cambium layer in infected areas. When scraping, look for long, narrow infections that extend beyond the canker margins. Remove all discolored tissue plus 6-8" more beyond the infection. This procedure is best done when trees are dormant. Don't apply any dressing to the wound. If the limb has been girdled, the whole limb must be removed.

Chemical Control Copper products are the only materials available to homeowners for fire blight control, and they often aren't adequate even with multiple applications. The spray might reduce new infections but won't affect those already existing. It must be applied to open blossoms; thus the number of applications needed depends on the length of the bloom period. Once blossoms begin to open, make the first application when the average temperature exceeds 60°F. Apply at four-day intervals during periods of high humidity, until bloom is over. Copper products may cause scarring of the fruit surface.