

What You May Not Know about Fire Blight

Dr. Nicole Ward
University of Kentucky
Asst. Professor of Extension

Fire blight can be a devastating bacterial disease of apple, crabapple, pear, and flowering pear, but disease epidemics are often sporadic. In fact, optimal conditions must be met for severe disease to occur. Our current conditions are an indication that fire blight may be severe this spring.

Erwinia amylovora infects trees through flowers. However, large numbers of bacterial cells must be present during flowering in order for the disease to develop into an epidemic. The fire blight pathogen favors rain and temperatures above 60°F. Under these conditions, bacterial cells multiply quickly. Thus, if conditions are favorable during flowering, infection can be severe.

Predictive systems are available for growers. University of Kentucky's Cougarblight model evaluates the potential for infection by analyzing temperature and leaf wetness data from the previous four days in order to estimate potential risk for infection. Trees must be in bloom for this predictor to be effective. Cougarblight is an excellent decision-making tool for growers and can be accessed at http://www.wagwx.ca.uky.edu/plant_disease.html.

Most growers are familiar with shoot blight, the most obvious fire blight symptom in which infected shoots die quickly, causing branch tips to form a distinct crook ([photo 1](#)). Shoot blight, however, does not result from infection of blossoms. Direct penetration of bacteria into green shoots or the upper leaves of young shoots after bloom typically causes shoot blight symptoms.

Initial fire blight infections occur through flowers. We call this symptom blossom blight. Petal browning is the first sign of petal blight, but many growers do not notice it. Browning of pedicels (stems that attach flowers to stems) follows. Often, droplets of bacterial ooze can be seen coming from pedicels ([photo 2](#)). Bacteria quickly travel down the spur and into the twig. Cankers that form around the spur-attachment site girdle branches, and then branch parts above the canker also die ([photo 3](#)).

Fire blight control measures include anti-bacterial pesticides applied during bloom. Applications made after bloom are ineffective. When fire blight risk is high (warm temperatures combined with rain) during bloom or if fire blight was a problem last year, the following spray schedule should be followed:

1. Apply fixed copper at silver tip. Homeowners should not skip this step, as it is their only tool available to combat fire blight. Do not use copper fungicides after bud break.
2. Apply streptomycin beginning at pink stage, repeating every 4-5 days, through petal fall. At least 2 applications are required, but up to 4 sprays may be applied, depending on rain and temperature conditions. Ideally, bactericides should be applied just before rains. Pay extra attention to susceptible varieties (i.e. Gala, Jonathan, and Rome). Utilize Cougarblight or MARYBLIGHT predictive systems for assistance. Mycoshield (oxytetracycline) is also available

for management of fire blight but is not as effective as streptomycin. Neither product is recommended for homeowner use.

Various cultural practices may be implemented to aid in disease management. Combine these practices with bactericide sprays above for best control.

1. Select disease resistant or disease tolerant varieties. Liberty, Pricilla, SirPrize, Enterprise, Gold Rush, and Sundance are recommendations from ID-21.
2. Prune last year's cankers and dead wood before bud break. Burn, bury, or completely remove prunings from the orchard to eliminate the possibility of bacterial cells being carried back to healthy tissue. Monitor predictive systems. Know your risk. Cool temperatures or no rainfall will result in low disease incidence.
3. Remove flower/fruit spurs immediately after symptoms develop so bacteria cannot continue infection into branches. Dip tools in 10% bleach, 10% Lysol concentrate, or pure rubbing alcohol after each cut to keep from spreading bacteria.
4. Do not prune limbs or branches during the growing season. Trees natural defenses wall off infection sites and stop disease spread. Remove these branches during the dormant season, instead, when threat of disease spread is lowest. Removal of all infected wood is critical to prevent spread of inoculum.

More information on fire blight can be found in [PPA-34](#) and [PPFS-FR-T-7](#).

Spray recommendations for commercial growers [ID-92](#) and homeowners [ID-21](#) are also available online.

Note, re-ordered version was submitted to KPN March 2012



Fig 1 – Blighting of shoots, also called shepherd's crook, is the most recognized symptom of fire blight on apple.

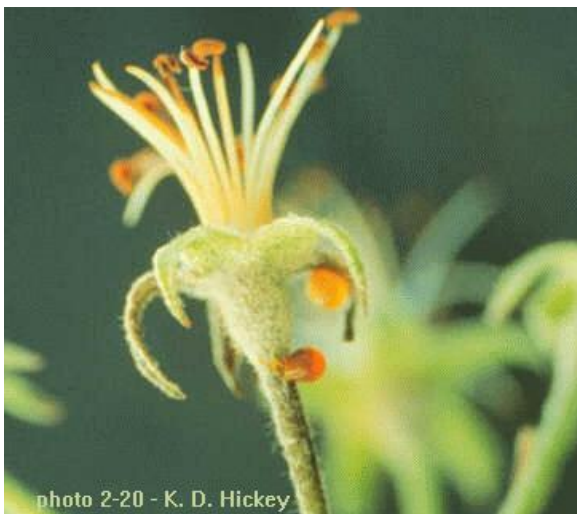


Fig 2 – Initial infection by the fire blight pathogen occurs through blossoms. Notice bacterial ooze coming from the pedicel.



Fig 3 – Bacteria can spread through flowers and spurs into twigs. Resulting cankers can girdle entire limbs and branches.