

Apple IPM for Beginners



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Fire Blight



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Time of Concern

Dormant (Silver tip) & Bloom, but all through growing season



silver tip



bloom

Damage



Figure 1. Oozing overwintering canker in spring.

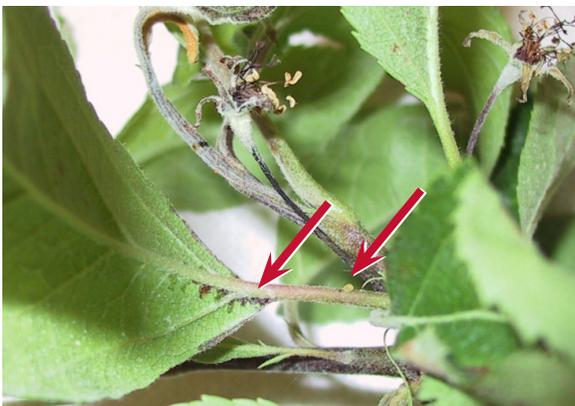


Figure 2. Blossom blight infection showing blackened veins at base of leaf and drop of ooze.

Pest Cycle

Fire Blight is a bacterial disease that attacks and infects all parts of apple and pear trees. The bacteria overwinter in the cambium of the trunk and branches. Figure 1 shows the bacteria oozing from the edge of an infected canker. In the spring, this bacterial ooze allows the disease to be carried by insects onto open blossoms, and bacteria multiply on the stigma, reaching dangerous numbers. Rain or dew moves bacteria to the base of the flower where it begins the infection process, causing the blossom and surrounding leaves to wilt and ooze more bacteria. A blighted blossom cluster is shown in Figure 2 with blackened flower stems and mid-vein of the adjacent leaf and a drop of yellow to amber ooze leaking from the stem. The infection moves from the blossom to adjacent shoot tips (shoot blight in Figure 3); and from the cankers, to adjacent shoots. The bacteria can travel through the cambium to the rootstock. Rootstocks such as M9 and M26 are very susceptible to fire blight and often become girdled, killing the tree (Figure 4). If fire blight is established in the orchard, a hailstorm facilitates the spread of bacteria, which in turn can infect wounds throughout the tree and fruit. Symptoms of wilting will appear approximately 7-10 days after the infection or hail event; this suggests a weekly schedule of scouting for fire blight.

Cultural Factor of Infection

Most apple cultivars are susceptible to fire blight infections if they are growing too vigorously and the weather is warm. Many hard cider varieties bloom very late and therefore are very susceptible to blight. Do not over-fertilize with nitrogen. Pruning hard in the winter also stimulates extreme shoot growth, which is very susceptible to fire blight during the growing season. Pick off blossoms on newly planted trees before warm, wet, weather, which is ideal for fire blight infection.

Damage, continued



Figure 3. Shoot blight infection of growing terminal.



Figure 4. Rootstock blight, which occurs in susceptible rootstocks such as M9 and M26, will girdle and kill the tree.

IPM Steps for Beginners

1. Prune out cankers in the winter; cut shoot strikes and oozing cankers as soon as you see them. Cut 12-18" behind watersoaked symptoms in the bark. If the main trunk is infected, remove the tree.
2. Using copper for the first scab spray at silver to green tip, as well as at green tip to ¼-green will also help reduce (but not remove) the potential for fire blight.
3. To reduce infection, remove blossoms on trees too young to fruit before they open. Copper (at low rates on label) can be sprayed at first bloom, full bloom, and petal fall, but can cause rough fruit finish (russet) under slow drying conditions. Do not use copper during bloom on Golden Delicious.
4. If there is a history of fire blight problems nearby, spray streptomycin during bloom if warm, wet weather, and blossom infection is likely. Remove wild apple trees from hedgerows; ornamental pears, hawthorns, and crabapples can be hosts too. You may need multiple applications (not typically more than 3 per variety).
5. Blossom infection is likely if any blossoms are open, and you have 3 days in the mid-70s°F, or 2 days in hi-70s and low 80s. If a "high" risk is predicted, it takes very little moisture (dew) to move the bacteria to the base of the flower. If it's warm enough for you to perspire, check the temperatures in the forecast. There is likely a risk of blossom blight infection.
6. Don't over-fertilize with nitrogen—quick-growing shoots are particularly susceptible to fire blight.

Phases of fire blight disease symptoms					
Fire Blight Phase	Dormant- Green Tip	Bloom	Petal Fall	Terminal Bud Set	Harvest
Cankers					
Blossom blight					
Canker blight					
Shoot blight					
Rootstock blight					

Ready for More Precision?

Pay very close attention to new orchard plantings. They bloom later than established orchards and usually during warmer weather when the risk of blossom infection is higher. Apply copper at planting time, and again when buds begin to grow. Remove blossoms before they open, but without removing the shoot growing from the blossom cluster. Do not risk spreading fire blight when training new trees by cutting competing leader shoots or removing blossoms during warm, wet weather. If blossoms cannot be removed, apply an anti-bacterial product.

Go to the NEWA website (newa.cornell.edu) for a location near you. There you will find forecasts of blossom blight predictions and when symptoms are predicted to appear. At the NEWA Apple Disease Models page (newa.cornell.edu/index.php?page=apple-diseases), enter your own first open blossom date, and enter dates when streptomycin was applied. Figure 5 shows the risk of blossom infection predicted in NEWA using past and forecasted weather data. If you use a biological product, these must be applied early in bloom (1-5% bloom) before high risk is predicted.

Fire Blight Risk Predictions for Sodus (Lake)

Blossom blight predictions using the Cougarblight model begin at first blossom open.

First blossom open date:

First blossom open date above is estimated based on degree day accumulations or user input. Enter the actual date for blocks of interest and the model will calculate the protection period during bloom more accurately.

Orchard Blight History:

The orchard blight history above is the NEWA default. Select the actual blight history for your orchard and the model will recalculate recommendations.

Blossom Blight Summary - Cougarblight

	Past	Past	Current	Blossom Blight 5-Day Forecast				
				Forecast Details				
Date	May 8	May 9	May 10	May 11	May 12	May 13	May 14	May 15
4-day DH	-	268*	398*	413*	450	324	312	614
Risk Level	-	Caution*	High*	High*	High	High	High	Extreme
Wetness Events								
Rain Amount	NA	0.50	0.27	0.00	0.01	0.28	0.54	0.07
Rain Prob (%) Night Day ?			- -	- -	- -	- -	- -	- -
Dew ?	NA	Yes	Yes	No	No	No	Yes	Yes
Leaf Wetness (hours)	NA	14	6					

NA - data not available

[Cougarblight Charts](#)

Download Time: 5/10/2014 23:00

Figure 5. NEWA apple disease forecast for fire blight infection of blossoms. Source: newa.com

