For 50 years, New York's apple growers have kept fire blight at bay using the antibiotic streptomycin. But streptomycin-resistant strains of fire blight have recently been discovered in four locations in Wayne and Ontario counties, prompting warnings to those who maintain New York's 50,000 acres of apple orchards. This is a serious situation which we need to manage effectively. The rapid identification of this outbreak positions us to implement a coordinated plan for this year's (2012) growing season.

Fire blight is caused by the bacterium Erwinia amylovora, earning its name for the scorched appearance of infected leaves and branches. Its symptoms include blackening of flowers and young leaves, resulting in crop loss and even death of trees.

Strep-resistant fire blight was first identified in California in 1971, and since then it has been found in Washington, Oregon, Missouri, and southwest Michigan. Diseased nursery trees from Michigan were the source of a limited outbreak in New York in 2002. At that time, we worked closely with the growers concerned and insured that all the infected trees were destroyed and surrounding farms were checked. That eradication appears to have been effective.

For the past 10 years, extension staff have sent in samples for routine surveillance, and we hadn't found it again. This current infection was first spotted this fall from samples sent in by a private crop consultant which were collected in Wollcott, N.Y., where a persistent fire blight infection that evaded a streptomycin spray regime. Staff in Aldwinckle's lab, Shirley Kuehne and Ewa Borejsza-Wysocka, isolated the bacteria and tested them. They were indeed resistant to streptomycin and confirmed as Erwinia amylovora, (SR Ea). Further testing of samples from other areas in the fall of 2011 showed that there are several outbreaks of strep-resistant fire blight in Wayne and Ontario counties (Figure 1). Because sampling was necessarily limited in late fall, until additional samples are studied in 2012, the full extent of the outbreak is unclear.

One of the sites where strep-resistant fire blight was identified is a nursery which complicates the management plan of this outbreak. Fortunately, that nursery has a strict rouging program to eliminate infected trees which should minimize the chance of spread. However, some infections might not be immediately visible, so there's a possibility that a small number of trees with the SR Ea strain were inadvertently shipped to growers. We advise all growers to examine their trees carefully and watch for any symptoms of fire blight that may develop after planting. These recommendations apply to all trees purchased, with particular attention for those from New York and Michigan nurseries where strep-resistant fire blight is known to occur.

Management Guidelines for 2012

The areas of strep-resistant fire blight outbreaks shown in Figure 2 are regarded as High Risk for streptomycin-resistant fire blight in 2012. In this area it is likely that streptomycin will provide less than adequate control of blossom infection.

An emergency use Section 18 for an equally effective antibiotic, kasugamycin (trade name Kasumin), was applied for but was not granted for use in New York in 2012. Kasugamycin would give excellent blossom blight control of SR Ea as well as regular fire blight. Prohexadione-Calcium (Apogee) should be effective toward SR Ea shoot infections.

General Recommendations For All Areas
1. All fire blight cankers should be removed during winter pruning.
2. Copper sprays should be applied at green tip.
3. CCE warnings of fire blight infection periods should be heeded, and recommended materials sprayed promptly.
4. Prohexadione-Calcium (Apogee) sprays should be seriously considered.
5. Fire blight strikes should be pruned out promptly and destroyed.
6. If severe blossom blight occurs after streptomycin was applied in accordance with CCE predicted fire blight infection periods, contact CCE for SR Ea testing.
High Risk Areas
1. Follow general recommendations (above).
2. When blossom infection is forecast, apply tankmix of oxytetracycline and streptomycin, both at full rates.
3. Prohexadione-Calcium (Apogee) sprays should be used at high rate, applied at King bloom petal fall (mid bloom when shoots are 2-3 inches long).

Non-High Risk Areas
1. Follow general recommendations.
2. When blossom infection is forecast, apply streptomycin or tankmix of oxytetracycline and streptomycin.
3. Prohexadione-Calcium (Apogee) sprays should be seriously considered, especially on highly-susceptible varieties.

Recommendations For Planting New Trees
1. If possible, plant varieties grafted on fire blight-resistant rootstocks.
2. Trees should be carefully examined for fire blight infections before planting. Infected trees should be discarded. Samples should be submitted for strep-resistance testing – see instructions below.
3. Immediately after planting a copper spray should be applied. 
4. Planting should be scouted at 7-day intervals for fire blight strikes until June 30. Infected tree should be removed. Plantings also need to be scouted 7-10 days after hail or severe summer storms and at the end of the season (mid-September). The NEWA/NRCC disease forecasting models for fire blight (http://newa.nrcc.cornell.edu/newaModel/apple_disease) can assist by providing an estimate of symptom emergence following a storm or other trauma event.
5. If possible, remove flowers before they open. Since most new plantings have many blossoms the first year, and many orchards are high density (i.e. 1000-2000 trees per acre), blossom removal may not be possible. If practiced, the blossoms should be removed before there is a high risk of FB infection.
6. Apply copper, tank mix of streptomycin and oxytetracycline at the full label rate for each during any remaining bloom based on blossom blight predictions. The NEWA/NRCC disease forecasting models for fire blight (http://newa.nrcc.cornell.edu/newaModel/apple_disease) will run nearly until August, and have an adjustable bloom date to account asynchronous or late bloom in new plantings.
7. Trees should receive a second copper spray at a stage equivalent to bloom. 48 hours REI before blossom removal.
8. Samples of any infections seen after planting should be submitted for strep-resistance testing – see instructions below.

Save fire blight infected trees and strikes, and call one of the persons below to come and collect samples and take data on the situation.
Debbie Breth, Tel: 585-747-6039
Juliet Carroll, Tel: 315-787-2430

Herb Aldwinckle is a professor of plant pathology who leads Cornell’s program on the control of fire blight and apple genetic engineering. Debbie Breth is a senior extension educator and team leader of the Lake Ontario Fruit Program of Cornell Cooperative Extension who specializes in integrated pest management. Kerik Cox is a research and extension professor of plant pathology who leads Cornell’s extension program in tree fruit and berry diseases.
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