

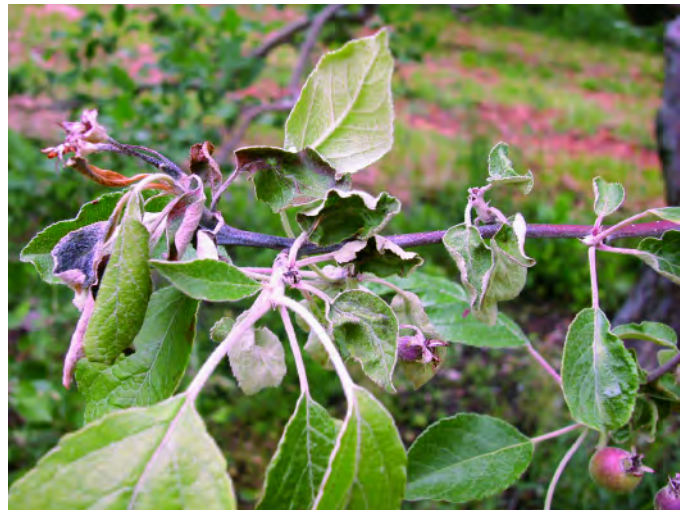
Research Progress and Impact

# Protecting Orchards from Fire Blight Bacteria

## Summary of Research Accomplishments

- Identified new biological control agents that can help fight the disease.
- Identified genetic differences in closely related bacteria that cause fire blight on apples or brambles.
- Screened a fire-blight-tolerant apple variety as a possible source of resistance genes.
- Identified a new gene in the fire blight pathogen.
- Identified alternatives to streptomycin that can control fire blight.

George Sundin/MSU



Fire blight can kill an apple tree in as little as 30 days. After several years of field trials, MAES scientists have identified promising biological controls for the disease.

Kurt Stepnitz/MSU



MAES scientists have identified genetic differences in closely related bacteria that cause fire blight on apples or brambles, as well as found a possible source of resistance genes.

## Research for your future.

For questions about this or other MAES publications, contact Val Osowski (osowskiv@msu.edu; 517-355-0123).

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*All USDA project reports are peer-reviewed.*

## Protecting Orchards from Fire Blight Bacteria

Researchers at the Michigan Agricultural Experiment Station (MAES) and the New York Agricultural Experiment Station are cooperating to battle fire blight, a bacterial disease that poses a major threat to Michigan's apple trees.

### SUMMARY OF RESEARCH ACCOMPLISHMENTS

**Identified new biological control agents that can help fight the disease.** After several years of field trials, MAES scientists have identified promising biological control agents for fire blight. These materials could be registered for use by growers as early as 2008 and would be effective in integrated programs designed to control streptomycin-resistant fire blight.

**Identified genetic differences in closely related bacteria that cause fire blight on apples or brambles.**

Determining why similar bacteria strains cause disease on only one plant host and not the other will help MAES scientists understand the role of specific genes in causing fire blight on apples.

**Screened a fire-blight-tolerant apple variety as a possible source of resistance genes.** MAES scientists studied the genetic makeup of the disease-tolerant apple cultivar Red Delicious and identified approximately 30 genes that could be involved in fire blight resistance.

George Sundin/MSU



Fire blight affects the blossoms of fruit trees, causing blossom blight and infecting the emerging fruit. MAES scientists have identified alternatives to streptomycin that can control the disease.

These genes can be used as markers in breeding programs to rapidly identify fire-blight-resistant lines.

**Identified a new gene in the fire blight pathogen.** MAES scientists discovered a new virulence gene in the fire blight bacterium similar to one found in other bacterial plant pathogens. Because a resistance gene to this particular virulence gene has already been identified in a different plant host, MAES

scientists are now screening apple varieties and rootstocks to see if any contain the resistance gene.

**Identified alternatives to streptomycin that can control fire blight.** Streptomycin-resistant strains of fire blight bacteria in apple orchards make it difficult to control the disease. MAES scientists have identified alternative chemical, biological and cultural control methods that can be used instead of streptomycin in certain conditions to help control blossom blight. These streptomycin alternatives can prevent catastrophic losses for apple growers when fire blight strikes.

*Research for your future.*

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