



Managing Diseases of Tree Fruit Crops

Program Leader: David Rosenberger, Professor and
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Cornell's Hudson Valley Lab
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Program Objectives:

- Develop cost-effective and environmentally sound pest management strategies for apples and other tree fruits by integrating the latest information on pesticides, genetic resistance, sanitation, cultural practices, and pathogen biology.
- Provide fruit growers, extension educators, crop consultants, and agrichemical companies with the latest information on disease control strategies for tree fruits.
- Identify causes of any new diseases or unusual problems that appear in orchards and advise fruit growers on the best control options.
- Foster effective communication among the various parties (extension, crop consultants, agchem businesses) that serve NY fruit growers by chairing Cornell's Tree Fruit and Berry Program Work Team.



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Program Summary:

Field trials are designed to address information gaps that limit our abilities to control diseases in tree fruit crops. Results from field trials and from monitoring of disease development each season are communicated to growers, extension educators, and crop consultants via presentations at winter meetings and via articles that appear in regional fruit newsletters and in the online *Scaffolds Fruit Journal* (<http://www.scaffolds.entomology.cornell.edu/index.html>).

Specific projects include the following:

- Fungicide evaluations: Field trials are conducted at the Hudson Valley Lab each summer to evaluate new fungicides or new strategies for older fungicides. Fungicides are evaluated for their abilities to control apple scab, apple powdery mildew, apple rust diseases, flyspeck and sooty blotch, *Botryosphaeria* species that cause apple cankers and summer fruit decays, *Colletotrichum* species that cause bitter rot, *Penicillium* species that cause postharvest decays of apples, Fabraea leaf spot on pears, and fire blight of apples and pears.
- Effects of glyphosate herbicide on apple tree health: Field trials have been established to determine if apple trees subjected to sublethal doses of glyphosate via spray drift or sprayed root suckers are more susceptible to canker diseases and/or produce apples that have a reduced storage life.
- Disease susceptibility studies: New apple and stone fruit rootstocks are being evaluated for their susceptibility to tomato ringspot virus (ToRSV) and, for stone fruits, to X-disease.
- Reduced spray program are being developed for scab-resistant apple cultivars, with the objective of devising effective programs for organic apple farmers.



Leo Rosario, summer intern, measures fire blight cankers.

Program Justification:

Fruit growers contend with many fungal, bacterial, and viral pathogens that can reduce yields, destroy the crop, and in some cases, kill mature trees. Establishing a new high-density apple orchard costs more than \$15,000/A, and many apple growers are now spending more than \$1,000/A/yr for the pesticides and plant growth regulators needed to produce a crop. In these high-stakes enterprises, disease control practices must be integrated into whole-farm management strategies that allow for cost-effective management of diseases, insects, mites, weeds, crop load, and tree nutrition. Strategies must be evaluated and adjusted annually to compensate for changing pest complexes, input costs, pesticide resistance problems, and marketing objectives, and because all of the variables are subtly interconnected.

Impacts to Industry:

- Fungicide evaluations provide independent data on the efficacy of new fungicides before they are marketed to fruit growers, thereby increasing the likelihood that products will be applied appropriately (i.e., for diseases and situations where they provide a cost-effective solution for protecting the crop).
- Fruit disease alerts published in extension newsletters provide "just-in-time" information on disease management that is specifically tailored for the unique conditions that develop each season, thereby allowing fruit growers to adjust disease control strategies and avoid losses that would occur if they failed to independently recognize and react to unusual weather events or pathogen development.
- Information and expertise developed during field evaluations is frequently used in advising agrichemical companies on appropriate wording for new pesticide labels, thereby maximizing the usefulness of new products for New York fruit farmers.
- Studies on disease susceptibilities of new cultivars and rootstocks will help fruit growers to avoid planting trees that are unusually susceptible to problem diseases like X-disease and ToRSV.
- Understanding subtle interactions between herbicides and tree health will help growers modify herbicide programs so as to minimize adverse non-target effects.

Program Team Members:

Anne Rugh, research technician
Lindsay Sudol, seasonal technician
Frederick Meyer, part-time technician
Jeffrey Dimetro, summer assistant
Albert Woelfersheim, facility manager for
Cornell's Hudson Valley Lab
Donna Clark, administrative assistant for
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Key Collaborators:

Art Agnello, Alan Biggs, Janna Beckerman, Dan Cooley, Kerik Cox, Steve Hoying, Peter Jentsch, Henry Ngugi, Terence Robinson, George Sundin, Chris Watkins, Keith Yoder



Apple scab, a common fungal disease, as it appears on fruit and foliage.