



Disease Management for Floral and Nursery Crops

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Program Objectives:

Improve understanding and management of diseases of greenhouse and nursery crops:

- Help growers better utilize new tools, including new reduced-risk fungicides, biological controls, and SAR (systemic acquired resistance) materials
- Identify new diseases confronting the industry and develop control recommendations
- Develop new information that will lead to better management of diseases that commonly cause crop losses.



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Program Summary:

This program combines applied research with immediate extension of results to growers in NY and nationwide. Extension activities address pressing issues affecting ornamental crop health (e.g. challenges from *Pythium* root rot, *Fusarium* wilt, rust, downy mildew and powdery mildew on flower crops and *Phytophthora* diseases, and rusts on nursery crops). Research is conducted in several arenas:

Powdery mildews and downy mildews:

Cultivar comparisons, biological control trials, biorational and reduced-risk chemical tests. Impatiens, rudbeckia, poinsettia, gerbera, mini-rose, verbena, coleus, argyranthemum and rosemary are used in these studies. AFE-sponsored research has fueled progress in managing both powdery and downy mildew diseases. The new downy mildew problems on rudbeckia, impatiens and coleus are the focus of current research.

Root rots and vascular wilts:

Pythium: identification of what species are affecting greenhouse crops, finding the reservoirs of these organisms in the greenhouse, learning how cultural controls may reduce problems, evaluating the impact of fungicide resistance, and development of biological and chemical management strategies

Phytophthora: exploring biological/SAR/reduced risk control options for important new diseases on calibrachoa, pansy, poinsettia and petunia. Collaborative studies on improved tracking and management of root diseases are funded through the USDA (Floriculture and Nursery Research Initiative).

Thielaviopsis: chemical and cultural controls and cultivar comparisons.



A downy mildew disease threatens impatiens.

Program Justification:

In these challenging economic times, growers can ill afford plant diseases, as these invariably lead to dollar losses. Disease preventive treatments add to production cost, so these must be made efficient for business profitability. Disease control must also be designed to safeguard health of workers and the environment. Studies on biology of pathogens and trials evaluating new control techniques provide valuable information to the ornamentals industry. Leading growers today actively seek well-informed advice on how to improve their pest management programs, and closely follow applied research so that they can adopt better methods immediately.

Impact to Industry:

Our studies on coleus downy mildew have identified a new *Peronospora* species as the cause, and established that the pathogen can also affect agastache, perilla and basil. Studies have recently been conducted on the new impatiens downy mildew. Growers have been guided in identification and management strategies for these highly contagious new diseases.

In collaboration with Mary Hausbeck (MSU), research has been extended to growers on the environmental cues and management options for the powdery mildew disease of poinsettias. As a result, crop losses have sharply declined since a peak in 1992. Most recently we have shared with growers trial results on new biological controls and reduced risk chemicals that are effective. Knowledge of new management options for other powdery mildew and downy mildew diseases affecting snapdragon, miniature rose, gerbera, verbena, rudbeckia, impatiens and pansy has been extended as well.

Root disease management guidelines for growers have been improved through studies on control of *Pythium*, *Phytophthora*, *Fusarium* and *Thielaviopsis*. Ongoing work at Cornell in collaboration with Carla Garzon (Oklahoma State), Gary Moorman (Penn State) and Steve Jeffers (Clemson) has improved knowledge of what pathogen species are present in greenhouses today, how they may be identified using new DNA technologies, how they interact with fungus gnat vectors, and how they may be better managed. Many reduced-risk and biocontrol options have been identified. Floral and nursery product performance for the consumer is improved through skillful health management during crop production.

Program Team Members:

Project Team Members:

Lynn Hyatt, Research Support Specialist
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Some Key Collaborators:

Ann Chase, Gary Chastagner, Wade Elmer, Carla Garzon, Mary Hausbeck, Steve Jeffers, Levente Kiss, Neil Mattson, Bill Miller, Gary Moorman, John Sanderson, and Steve Wraight.



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