

Report to the Community IPM Grants Program December, 2014

Title: Late blight management in home and community gardens: benefits transcend Community/Ag boundaries

Project Leaders: Abby Seaman, Vegetable IPM Coordinator, NYS IPM Program
Lori Brewer, Senior Extension Associate, Department of Horticulture,
Cornell University
Elizabeth Lamb, Ornamentals IPM Coordinator, NYS IPM Program

Cooperators: Chris Smart and Meg McGrath, Department of Plant Pathology and Plant Microbe Biology, Cornell University

Abstract: Late blight is a serious plant disease that affects both home gardeners and farmers. Because infected plants produce huge quantities of spores that spread the disease, accurate disease identification and appropriate response are important for everyone in the community growing tomatoes or potatoes. We have engaged Cornell Cooperative Extension Master Gardener Coordinators to plan a series of five workshops for Master Gardener Volunteer across the state. We have updated information on disease resistant tomatoes and potatoes on the Vegetable Varieties for Gardeners web site (<http://vegvariety.cce.cornell.edu/main/login.php>), and are surveying greenhouse growers on their information needs around growing late blight resistant tomato varieties for sale to home gardeners.

Background and Justification: Late blight is a devastating disease of potato and tomato that is unique in its status as a “community disease,” in that the actions (or lack of actions) of individuals affect the larger community of tomato and potato growers. At present in the U.S., late blight only overwinters in living tissue such as potato tubers, or infected tomato plants that survive the winter in a greenhouse. Both commercial farmers and gardeners have the potential to unknowingly maintain the pathogen, which can then spread to anyone growing potato or tomato within a potentially 30 mile radius. In 2009, large numbers of gardeners experienced late blight for the first time when infected tomato transplants were sold widely throughout the Northeast, and rainy conditions contributed to fostering the “perfect storm” of late blight. Since 2009, late blight has occurred in the Northeast at levels substantially higher than it had in previous years (McGrath, unpublished data) with the same isolate dominating the pathogen population for the past three years. This suggests that late blight is overwintering in potato tubers in our region. While potato seed planted by commercial growers is one potential inoculum source, gardeners who are not aware of the pathogen life cycle may also be inadvertently saving and planting infected tubers or not destroying volunteer or cull potatoes. Extension educators and faculty throughout the Northeast have observed that the initial reports of late blight in their area are increasingly from gardens (McGrath, personal communication). Vegetable gardening has increased in the past several years (<http://www.mnn.com/your-home/organic-farming-gardening/stories/infographic-home-gardening-in-the-us>) partly because of the economic downturn and partly because of increased interest in healthy lifestyles. Both gardeners

and farmers will benefit if gardeners understand the biology of the pathogen, recognize symptoms, plant resistant varieties, and take measures to minimize inoculum sources. Planting resistant varieties and reducing inoculum sources will slow epidemic development and spread, help prevent crop losses, and reduce the number of fungicide applications needed to protect crops.

Many home gardeners use tomato transplants rather than starting their own seed. One complaint is that late blight resistant varieties are not available as transplants at local garden centers. In a previous project, we learned that garden centers growing transplants do not think that disease resistance is a primary characteristic for choice of variety by customers. However, late blight has become so well known by home gardeners and a source of questions for garden centers, that late blight resistant tomato transplants may be a marketable option of interest to garden centers.

Objectives:

- 1) Harmonize information and increase linkages between late blight information developed for farmers and that developed for gardeners
- 2) Create late blight resources and activities that will increase Cornell Cooperative Extension (CCE) Master Gardener Volunteers' skills, confidence, and level of outreach
- 3) Create late blight resources for garden centers/greenhouses selling tomato transplants, and their customers, to encourage the use of resistant varieties
- 4) Evaluation

Procedures:

We engaged Master Gardener Coordinators in a series of three webinars to gather their input on Master Gardener Volunteer (MGV) needs for late blight information and strategies to engage them in learning more about late blight and tomato foliar diseases in general with a goal of increasing their confidence in undertaking outreach activities about late blight and other tomato foliar diseases with the public. We have a series of workshops planned January – March 2015. The agenda for the workshops was developed during the webinars.

We developed a survey of MGV on their knowledge of late blight to establish a baseline. Workshop participants will take the survey again after the workshops and the entire group of MGV will be surveyed again at the end of the 2015 growing season.

We updated late blight resistance information on the Vegetable Varieties for Gardeners (VvFG) web site, harmonizing it with information developed for commercial vegetable farmers, and added four additional resistant varieties. We have baseline data for the number of reviews for varieties already listed, and will track reviews of these and the additional four varieties.

We developed a survey for greenhouse growers to determine how aware they are of late blight resistant tomato varieties, how many are growing late blight resistant tomato varieties for sale to home gardeners, and their needs for point of purchase information on

late blight and late blight resistant tomatoes. The survey will go out to growers in early January.

We are in the process of developing a one page handout/poster to help MGV and home gardeners distinguish between late blight, early blight, and Septoria leaf blight. This idea came from Master Gardener coordinators who participated in the webinars.

Resources (probably including a video) on what gardeners should do if they have late blight will be developed after the workshop series is completed. One of the exercises included in the workshops will be developing language for the messages we will convey. These resources will be adapted for use by retail operations for their customers.

Results and Discussion:

Results are pending, but through the MGV survey we have established a mechanism for tracking impacts from the project. The webinars proved extremely valuable for determining the needs of the MGV, developing the workshop agenda (below), and identifying needed resources for MGV and home gardeners.

Cornell Garden-Based Learning Regional Training for CCE Educators and Master Gardener Volunteers

In this training we spend much time understanding tomato diseases, specifically late blight. We believe deep understanding and skill in this one area will be empowering for participants and most valuable in addressing an important issue for gardeners and the vegetable growing industry. Moreover, we hope it is a foundation for better understanding plants and plant diseases in general.

The Blight: What To Know and Do

Welcome (15 minutes)

What is blight? What else could it be? (30 minutes)

Water molds, fungi, bacterial, viral, insect and abiotic factors including management

Why late blight is a big deal for growers and gardeners (15 minutes)

Key steps in plant diagnosis (15 minutes)

Walk-through for potato & tomato plant diagnosis (groups – 25 minutes)

Scenario packets with photos and/or situation descriptions

Teams provide diagnosis summary (15 minutes)

Walk-through diagnosis checklist/decision tree and comparison factsheets among septoria, early blight and late blight (5 minutes)

Examine late blight tissue in tomatoes and tubers using plant material, microscope, pictures and videos (15 minutes)

Brown Bag Lunch (30 minutes)

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What is most important at different stages in the season? (15 minutes)

Draft “take action” messages for gardeners in cross county teams (45 minutes)

- Prevention
- Scout/monitoring
- Tracking
- Diagnosis
- Slow the disease
- Surrender to the disease
- Overwinter

Revisit potato & tomato plant diagnosis to add messages (groups - 5 minutes)

Late blight resistant varieties including seed starting details (10 minutes)

Share ideas on community outreach (25 minutes)

Wrap up (5 minutes)

Training will be held at the 5 locations listed below. There will be 36 participating county teams including an educator and 3 to 5 volunteers (up to 180 participants). Teams will return to training additional volunteers and lead local programs on topic.

January 28th 10 am to 2:30 pm Wyoming County CCE – Warsaw
Allegany, Chautauqua, Erie, Genesee, Livingston, Wyoming

January 29th 9:00 am to 1:30 pm NYSAES (Geneva, NY) - Jordan Hall
Broome, Cortland, Ontario, Seneca, Tioga, Tompkins, Yates, Wayne

February 4th 10 am to 2:30 pm Saratoga County CCE - Ballston Spa
Albany, Columbia, Essex, Greene, Herkimer, Rensselaer, Saratoga, Schenectady,
Schoharie, Otsego, Warren

February 18th 10 am to 2:30 pm Orange County CCE - Middletown
Dutchess, Orange, Rockland, Putnam, Sullivan, Ulster, Westchester

March 18th 10 am to 2:30 pm Jefferson CCE - Watertown
Jefferson, St. Lawrence, Oneida, Onondaga

Samples of Resources Developed

Resources are still under development.