

Project Title: Plant Disease Diagnostics

Project Leader: Nick Brazee

Project Overview

The first step in effective disease management is an accurate diagnosis. The University of Massachusetts, Amherst recognizes the importance of reliable and prompt identification of plant problems for the turf, floriculture, vegetable, nursery, urban forestry and landscape industries. We serve farmers, horticulturists, landscape contractors, turf managers, arborists, nurseries, and others in agriculture and the green industries. In addition to plant disease and insect diagnostics, we also provide sound management strategies that utilize an integrated pest management approach. This includes cultural and chemical controls, when necessary. An emphasis is made to utilize management strategies that limit the input of insecticides, fungicides, bactericides and fertilizers into the landscape.

Activity Summary 2020

- Contribute to and update UMass Center for Agriculture websites (Agriculture & Landscape, Greenhouse, Turf, Vegetable, Urban Forestry) (35)
- Contribute to extension publications including (but not limited to) Landscape Message, HortNotes, VegNotes, Mayflower, and TurfTalk (40)
- Invited talks to commercial vegetable growers and commercial greenhouse operators (8)
- Invited Talks to landscape professionals, retail garden center employees, nursery managers, landscape designers. (Single day workshop, presentation or event) (13)
- Participate in National Plant Diagnostic Network, Northeast Region by attending annual meeting, participating in exercises, responding to new pest alert notifications, and entering information into national database. (5)
- Provide pathogen identification, disease diagnosis, and management recommendations (695)
- Respond to telephone and e-mail inquiries from commercial growers and the general public. Output possibly includes interviews with the media. (500)
- Participate in UMass Extension's Green School Program. Green School is a comprehensive certificate short course for Green Industry professionals held biennially and taught by UMass Extension specialists and University of Massachusetts faculty (6)

Total educational contacts

	Adult Contacts
Direct Contacts	2703
Indirect Contacts (Print, Web, etc...)	15000

Narrative Summary and Impact

In 2020, the UMass Plant Diagnostic Lab continued to fulfill its primary mission of providing reliable and accurate diagnoses of plant problems caused by diseases, insects and environmental stresses. As always, the lab provides detailed diagnostic reports outlining the biology and ecology of the pathogen/insect pest, when present, and environmentally sustainable management techniques. Sample submitters receive education on the specific plant pathogen or insect pest involved and management tactics tailored to the organisms found, age of the plant and specific site conditions. Despite the constraints of the pandemic, lab personnel participated in many educational outreach programs, which included: invited seminars for various stakeholder groups, editing and production of printed and electronic publications, editing technical manuals and updating fact sheets on many different CAFE websites. Things that could not be done this year that are typical components of any diagnostic season included twilight disease and insect walks and performing site visits for disease and insect identification. Applied research projects conducted through the Plant Diagnostic Lab focused on major pathogens of concern to tree care professionals and vegetable growers. Participants in educational outreach programs learn about the specific nature of plant problems and environmentally sustainable disease management. Numerous landscape professionals, vegetable growers, greenhouse managers and turfgrass supervisors express their gratitude for the service we provide. Many of these individuals often tell us that they could not do their job without the diagnostic and management assistance we provide. Membership in the National Plant Diagnostic Network provides staff with updates on exotic and quarantine pests, presents educational opportunities for professional development, and allows lab staff to educate growers about exotic and/or newly emerging diseases. Diagnostic support to the Vegetable, Greenhouse and Fruit programs educates extension staff and growers about the nature of specific plants problems and their management as well as environmentally sustainable techniques for disease management.

The decline and death of plants from disease, insects and environmental stresses has many detrimental effects. These adverse effects range from economical to environmental and span from agricultural to forest settings. For example, pathogen outbreaks at commercial farms result in reduced earnings, lower vegetable yields and greater reliance on crops grown outside the region. Additionally, the introduction of invasive insects of trees can result in widespread mortality, dramatically transforming residential landscapes and having major ecological impacts on forests. Correctly identifying the causal agents responsible for decline and death of plants is critical to successful management. While some diagnoses impact only a single plant, others have broad implications for an entire species of plant. Regardless, we seek to provide unbiased and accurate information to the concerned stakeholder. Because of the financial implications of insect and disease outbreaks, the UMass Plant Diagnostic Lab serves as a critical resource for the Commonwealth and New England.

The pandemic created a serious disruption in our ability to provide service to the stakeholders that rely on the UMass Plant Diagnostic Lab. However, once the lab was allowed to resume operation, after nearly three months of closure, it operated without further disruption through the rest of the year. This represents one of the greatest accomplishments of the year and highlights the importance of the lab to the state. Several submitters noted that they waited for the UMass Plant Diagnostic Lab to reopen, as opposed to sending samples to other state extension labs. The lab has assisted with or been the primary

lab diagnosing a variety of important insect pests and disease-causing pathogens this past year. The rapid expansion of beech leaf disease in southern New England is one example. By coordinating with private arborists, state agencies and neighboring states, we have assisted with tracking this emerging disease that threatens a primary tree species in New England. Several other invasive and/or emerging pests and pathogens continue to be identified from plant samples submitted to the lab. Through timely diagnostics and sound management advice, we are helping to slow and stop the spread of these invasive organisms in our region.

Collaborating Organizations

- National Plant Diagnostic Network, Northeast Region
- Massachusetts Nursery and Landscape Association
- New England Grows

