Plant Disease Diagnostics

Status: NIFA REVIEW

Project Director
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Organization Project Number

Accession Number
7002099

Start & End Date
10/01/2020

Organization
University of Massachusetts

To Project / Program
"Plant Disease Diagnostics"

Primary Critical Issue
Sustainable Agriculture and Food Systems

Fiscal Year
2023

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

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, increased pesticide usage, 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.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

In FY23, 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.

Briefly describe how your target audience benefited from your project's activities.

Numerous landscape professionals, vegetable growers, greenhouse managers and turfgrass supervisors express their gratitude for the services we provide. Many of these individuals often tell us that they could not do their job without the diagnostic and management assistance we provide. Participants in educational outreach programs learn about the specific nature of plant problems and environmentally sustainable disease management. They apply this knowledge and techniques in their business to meet the needs of their clients.

Peer-Reviewed Publications:

- Brazee NJ, Munck IA, McLaughlin K, Ferreira S and Keleher N. 2023. Diplodia twig canker (*Diplodia gallae*) of northern red oak (*Quercus rubra*) in the northeastern United States. Forest Pathology e12822, doi.org/10.1111/efp.12822
- Okun A, Brazee NJ, Clark JR, Cunningham-Minnick M, Burcham DC, and Kane B. 2023. Assessing likelihood of failure due to stem decay using different assessment techniques. Forests 14(5): 1043, doi.org/10.3390/f14051043
- Brazee NJ and Burcham DC. 2023. Internal decay in landscape oaks (*Quercus* spp.): incidence, severity, explanatory variables, and estimates of strength loss. Forests 14(5): 978, doi.org/10.3390/f14050978
- Burcham DC, Brazee NJ, Marra RE and Kane B. 2023. Geometry matters for sonic tomography of trees. Trees: Structure and Function, doi.org/10.1007/s00468-023-02387-4
- **Online Articles Newsletters:**
- Brazee, NJ. HortNotes, March 2023, Septorioides Needle Blight, https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-341
- Brazee, NJ. HortNotes, April 2023, Verticillium Wilt, https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-342

- Brazee, NJ. HortNotes, November 2023, Brown Spot Needle Blight,
- https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-349
- Brazee, NJ. HortNotes, December 2023, *Root and Butt rot caused by Niveoporofomes spraguei*
- https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-3410
- Brazee, NJ. UMass Extension Landscape Message: 20 unique newsletters reviewing weather conditions, pest/pathogen activity from the Pioneer Valley region along with descriptions of notable samples from the UMass Plant Diagnostic Laboratory, https://ag.umass.edu/landscape/landscape-message-archive
- Madeiras AM, August 2023, Troublemaker of the Month: Macrophoma Leaf Spot of Boxwood, Growers/Homeowners, https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-346
- Madeiras AM, July 2023, Troublemaker of the Month: Flea Beetles, Growers/Homeowners, https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-345
- Madeiras AM, 7/10/2023, Turf Update: Heavy Rain + Hot Weather = Slime Mold, Turf Managers/Homeowners, https://ag.umass.edu/turf/management-updates-july-10-2023
- Madeiras AM, 7/10/2023, Greenhouse Update: Impatiens Downy Mildew, Growers/Homeowners, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-july-31-2023
- Madeiras AM, 6/30/2023, Greenhouse Update: Tobacco Rattle Virus on Peonies, Growers/Homeowners, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-june-30-2023
- Madeiras AM, 6/27/2023, Greenhouse Update: Downy Mildew of Sunflower, Growers/Homeowners, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-june-27-2023
- Madeiras AM, 5/22/2023, Greenhouse Update: Tomato Brown Rugose Fruit Virus (ToBRFV) This Spring, Growers/Homeowners, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-may-22-2023
- Madeiras AM, 5/11/2023, Greenhouse Update: Downy Mildew on Coleus, Growers/Homeowners, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-may-11-2023
- Madeiras AM, 5/5/2023, Landscape Message: Winter Injury of Tulips, Landscapers, https://ag.umass.edu/landscape/landscape-message-may-5-2023
- Madeiras AM, May 2023, Tomato Brown Rugose Fruit Virus (ToBRFV) - Information for home gardeners, Homeowners, https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-343
- Madeiras AM, May 2023, Troublemaker of the Month: Fusarium Bulb Rot of Tulips, Growers/Homeowners, https://ag.umass.edu/landscape/newsletters/hort-notes/hort-notes-2023-vol-343
- Madeiras AM, 4/18/2023, Greenhouse Update: Botrytis Blight, Growers, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-april-18-2023
- Madeiras AM, 4/10/2023, Greenhouse Update: Iron/Manganese Toxicity in Geraniums, Growers, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-april-10-2023
- Madeiras AM, 4/4/2023, Greenhouse Update: Be On the Lookout for Broad Mites, Growers, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-april-4-2023
- Madeiras AM, 4/3/2023, Greenhouse Update: Pythium Root Rot of Dianthus, Growers, https://ag.umass.edu/greenhouse-floriculture/greenhouse-updates-april-3-2023
- Clements JC, Cooley DR, and Madeiras AM, January 2023, Southern blight on apples – a new root disease problem for apples in the Northeast, Apple Growers, http://umassfruitnotes.com/v88n1/Cover881abcd.html

Briefly describe how the broader public benefited from your project's activities.

Diagnostic results and recommendations on over 292 samples submitted in FY23

The public benefits from the actions of the UMass Plant Diagnostic throughout healthier vegetables, fruit, greenhouse plants and trees and shrubs. Better educated and informed green industry professionals can better serve their clients in the public sphere. We also seek an integrated pest management approach that reduces the use of pesticides applied in managed landscapes. We offer a broad array of online content that is widely available to a general audience.

Online Fact Sheets:

- Cedar-Quince Rust: https://ag.umass.edu/landscape/fact-sheets/cedar-quince-rust
- Botryosphaeria Canker: https://ag.umass.edu/landscape/fact-sheets/botryosphaeria-canker
- Septorioides Needle Blight: https://ag.umass.edu/landscape/fact-sheets/septorioides-needle-blight
- Thyronectria Canker: https://ag.umass.edu/landscape/fact-sheets/thyronectria-canker

- Fusarium Wilt of Fragrant Sumac: https://ag.umass.edu/landscape/fact-sheets/fusarium-wilt-of-fragrant-sumac
- Beech Leaf Disease: https://ag.umass.edu/landscape/fact-sheets/beech-leaf-disease
- Phyllosticta Leaf Blotch: https://ag.umass.edu/landscape/fact-sheets/phyllosticta-leaf-blotch
- Brown Spot Needle Blight: https://ag.umass.edu/landscape/fact-sheets/brown-spot-needle-blight
- Tubakia Leaf Blotch: https://ag.umass.edu/landscape/fact-sheets/tubakia-leaf-blotch
- Root and Butt Rot caused by *Niveoporofomes spraguei*: https://ag.umass.edu/landscape/fact-sheets/root-butt-rot-caused-by-niveoporofomes-spraguei
- Root and Butt Rot caused by *Kretzschmaria deusta*: https://ag.umass.edu/landscape/fact-sheets/root-butt-rot-caused-by-kretzschmaria-deusta
- Root and Butt Rot caused by *Grifola frondosa* (Hen of the Woods): https://ag.umass.edu/landscape/fact-sheets/root-butt-rot-caused-by-grifola-frondosa-hen-of-woods

Extension Presentations:

- Madeiras AM, Fungicides 101, 11/7/2023, UMass Extension Pesticide Education Program, (157 in attendance)
- Madeiras AM, Plant Disease Diagnostics, 11/3/2023, Guest Lecture STOCKSCH 550, (50 in attendance)
- Madeiras AM, Downy Mildews in the Greenhouse, 8/16/2023, Massachusetts Flower Growers Association Summer Meeting, (48 in attendance)
- Madeiras AM, Plant Disease Diagnostics, 8/15/20203, REEU (Research and Education in Extension for Undergrads), (9 in attendance)
- Madeiras AM, Introduction to Plant Pathology, 8/14/2023, REEU (Research and Education in Extension for Undergrads), (9 in attendance)
- Madeiras AM, Pesky Pythium, 7/19/2023, UMass Extension Field Turf Day, (293 in attendance)
- Madeiras AM, Disease Management in the Greenhouse, 4/27/2023, Guest Lecture STOCKSCH 315, (39 in attendance)
- Madeiras AM, Managing Bacterial Diseases in the Greenhouse, 3/2/2023, UMass Extension Greenhouse Winter Education Program, online, (78 in attendance)
- Madeiras AM, Biology and Management of Turf Diseases, 2/17/2023, UMass Extension Turf Education Program for Mainely Grass, online, (48 in attendance)
- Madeiras AM, Plant Pathology for Master Gardeners, 2/14/2023, Barnstable County Extension, online, (25 in attendance)
- Madeiras AM, 1/11/2023, Cultural and Chemical Management of Turf Diseases, UMass Extension Turf Winter School, online, (70 in attendance)
- Madeiras AM, 1/6/2023, Diseases of Strawberries, New England Vegetable and Berry Growers Association Winter Meeting, (87 in attendance)
- Madeiras AM, 1/4/2023, Introduction to Plant Pathology, UMass Extension Turf Winter School, online, (70 in attendance)
- Brazee, NJ. Review of Pests and Pathogens from the 2022 Growing Season, Sturbridge, MA, 01/01/2023, Annual Meeting of the Massachusetts Tree Wardens and Foresters' Association (*200 in attendance*)
- Brazee, NJ. Review of Pests and Pathogens from the 2022 Growing Season, remote, 01/24/2023, Annual Meeting of the Cape Cod Landscape Association (*62 in attendance*)
- Brazee, NJ. Review of Pests and Pathogens from the 2022 Growing Season, Foxborough, MA, 02/01/2023, SiteOne Recertification Seminar (*100 in attendance*)
- Brazee, NJ. Pathogens of Landscape Trees & Shrubs: Trends from the 2022 Growing Season, remote, 02/28/2023, UMass Tree Conference (*145 in attendance*)
- Brazee, NJ. Pathogens of Landscape Trees & Shrubs: Trends from the 2022 Growing Season, Concord, NH, 03/01/2023, Annual Meeting of the New Hampshire Arborist Association (*90 in attendance*)
- Brazee, NJ. Pathogens of Landscape Trees & Shrubs: Trends from the 2022 Growing Season, Southbury, CT, 03/08/2023, Annual Meeting of the Northeastern Division of the American Phytopathological Society (*36 in attendance*)
- Brazee, NJ. Diplodia Twig Canker (*Diplodia gallae*) of northern red oak (*Quercus rubra*) in the northeastern United States, Southbury, CT, 03/10/2023, Annual Meeting of the Northeastern Division of the American Phytopathological Society (*45 in attendance*)
- Brazee, NJ. Diseases of Trees & Shrubs: Predictions for the Upcoming Growing Season, remote, 03/29/2023, UMass Extension Spring Kick-Off (*75 in attendance*)
- Brazee, NJ. Forestry Volunteer, Mass Envirothon Volunteer, Blackstone River and Canal Heritage State Park, Uxbridge, MA, 05/25/2023 (*150 in attendance*)
- Brazee, NJ. Diseases of Landscape Conifers, Arnold Arboretum, Boston, MA, 09/12/2023, UMass Extension Walkabout (*35 in attendance*)
- Brazee, NJ. The Use of Sonic and Electrical Resistance Tomography in Tree Risk Assessment, Saratoga Springs, NY, 09/25/2023, Field Demonstration at The New York Invasive Species Expo (*25 in attendance*)
- Brazee, NJ. Tree & Shrub Disease Update, Walpole, MA, 09/27/2023, Massachusetts Arborist Association Annual Field Day (*140 in*

attendance)

- Brazee, NJ. Review of Diseases of Trees & Shrubs from the 2023 Growing Season, Milford, MA, 11/29/2023, UMass Extension Fall Wrap-Up (*100 in attendance*)
- Brazee, NJ. Introduction to Plant Pathology, West Stockbridge, MA, Berkshire Botanical Garden Continuing Education Series (*25 in attendance*)
- Beech Bark Disease: https://ag.umass.edu/landscape/fact-sheets/beech-bark-disease
- Trunk Rot caused by *Cerioporus squamosus* (Dryad's Saddle): https://ag.umass.edu/landscape/fact-sheets/trunk-rot-caused-by-cerioporus-squamosus-dryads-saddle
- Root and Butt Rot caused by *Ganoderma sessile*: https://ag.umass.edu/landscape/fact-sheets/root-butt-rot-caused-by-ganoderma-sessile
- Black Knot of *Prunus*: https://ag.umass.edu/landscape/fact-sheets/black-knot-of-prunus
- Root and Butt Rot caused by *Laetiporus cincinnatus* & *L. sulphureus* (Chicken of the Woods): https://ag.umass.edu/landscape/fact-sheets/root-butt-rot-caused-by-laetiporus-cincinnatus-l-sulphureus-chicken-of-woods

Comments (optional)

Not Provided