Project number and title: NCERA-224: IPM Strategies for Arthropod Pests and Diseases in Nurseries and Landscapes
Period covered: 1/1/2018-12/31/2018
Date of report: 02/20/2019
Annual meeting dates: 12/3/2018-12/4/2018

Participants:
Adams, Gerard C. – University of Nebraska
Addesso, Karla – Tennessee State University
Bonello, Pierluigi – Ohio State University
Chastagner, Gary – Washington State University
Cranshaw, Whitney – Colorado State University
Herms, Daniel A. – The Davey Tree Expert Company
Jesse, Laura – Iowa State University
Krischik, Vera – University of Minnesota
Rodriguez Salamanca, Lina – Iowa State University
Sakalidis, Monique – Michigan State University
Smitley, David – Michigan State University
Williamson, R. Chris – University of Wisconsin

Brief summary of minutes of annual meeting:
The 2018 annual meeting of the NCERA-224 working group was held 3-4 December 2018 at the Morton Arboretum, Lisle, IL. The meeting opened with a state report session, followed by a discussion of current and future collaborative projects, and closed with a tour of the research facilities at the Morton Arboretum.

Meeting attendees:
Aiken, Joe - ArborJet
Beckerman, Janna – Purdue University
Chastagner, Gary – Washington State University
Chong, Juang Horng – Clemson University
Kunkel, Brian – University of Delaware
Miller, Fredric – Joliet Junior College and Morton Arboretum
Sadof, Cliff – Purdue University
Sakalidis, Monique – Michigan State University
Smitley, David – Michigan State University

The following are highlights of the state reports.

<u>Cliff Sadof (entomologist) and Janna Beckerman (pathologist) – Purdue University</u>
The team at Purdue University developed the Landscape Report, a newsletter and information portal for ornamental plant pest issues. The visitation statistics were shared, and noted that much of the traffic to the Landscape Report came through Facebook and that more than half were read on mobile devices. Extreme winter weather in the past two years had provided the team a unique opportunity to study the relationship between the viability of overwintering bagworms with winter temperature and the percentage of

impervious surfaces. Studies on the emerald ash borer continue, and demonstrated that spring treatment resulted in less severe canopy thinning than fall treatment but the effect of distance to the treatment trees on the result of the "halo effect" still need to be studied. Fungicide trials demonstrated that combination products containing fungicides of FRAC groups 7 and 11 were effective against powdery mildew.

Dave Smitley (entomologist) and Monique Sakalidis (pathologist) – Michigan State University

Dave Smitley reported on continuing work on evaluating the distribution and effectiveness of microsporidian *Ovavesicula popiliae* against Japanese beetle. The microsporidian was detected in 75% of the Japanese beetle population over a 15-year period, and can cause 95% mortality in overwintering grubs. This biological control agent may be introduced to the leading front states of Japanese beetle invasion. Hemlock wooly adelgids are detected in western Michigan, and at this time eradication is not recommended. Management options for reducing the population of adelgids are available. More gypsy moths are also detected in 2018. Ememectin benzoate (TreeAge) and acephate (Lepitect) were reported to be effective. Monique Sakalidis reported on recent works with blue spruce decline, and introduced the group to the symptoms and epidemiology of the disease. A survey on the prevalence and importance of blue spruce decline has been conducted, and more samples will be needed.

Brian Kunkel (entomologist) – University of Delaware

Brian Kunkel reported on a project to demonstrate to stakeholders the relationship between stresses (planting and environmental) and infestation by the emerald ash borer. The project was started in 2018 and will become available in 2019. Studies on managing cottony camellia scale, Japanese maple scale, whitefly and citrus mealybug with systemic insecticides, insect growth regulators and other insecticides were discussed. Management trials against redheaded flea beetle continued, but products tested under the IR-4 project did not provide sufficient efficacy. Root mealybugs have become an increasingly common pest issue, and study results suggested good efficacy of systemic insecticides and IRAC group 9 insecticides. Updates on the spotted landternfly were provided to the group.

Gary Chastagner – Washington State University

Gary Chastagner reported on a project to study botrytis infection of poenies in Alaska. Although as many as 10 new *Botrytis* species were found on poenies, not all are pathogenic. Management of foliar diseases on bulb and cut flower crops were discussed. Additional studies have been conducted to determine the optimal storage temperature to reduce botrytis on poenies. Studies on the management of diseases on cut flowers, Christmas trees and other commodities continue.

Fredric Miller – Joliet Junior College and Morton Arboretum

This team participated in the Illinois Forest Health program, which conducted monitoring of infestation by thousand canker disease (and the associated walnut twig beetle), bur oak blight, and emerald ash borer. An extensive work on controlling emerald ash borer infestations in the neighbor with parasitoids and *Beauveria bassiana* is ongoing. Efforts were also made to study the issue of herbicide drift damage by dicamba and 2,4-D.

JC Chong – Clemson University

This research team is involved in several projects to evaluate management tools for turf and ornamental pests. A study to identify the most commonly diagnosed scale insect species (nationwide) suggested that the top 20 armored scales, top 20 soft scales and top 5 "other' scales accounted for more than 80% of all sample submissions nationwide. By developing extension resources for these common scale insect species, we can satisfy the need for identification and management information for most of the scale insect infestations. A mealybug species new to South Carolina, and attack muhly grasses, was introduced to the working group. This team also reported on the efficacy of afidopyropen, a new insecticide (IRAC group 9D), against aphids, whiteflies and mealybugs. This research team participates in the elm bark beetle survey, and reported significantly higher capture in western SC (higher elevation) of two elm bark beetle species.

The following are highlights of current and future collaborative projects.

Current collaborative project: Elm bark beetle diversity

Whitney Cranshaw leads a collaborative project on surveying for elm bark beetle diversity nationwide. Participants of this project are several NCERA-224 members: Karla Addesso (TN), JC Chong (SC), Vera Krischik (MN), Fredric Miller (IL), and Dave Smitley (MI). Sampling for 2018 has been completed, and samples are been identified and analyzed. Additional sampling will be conducted in 2019 and expanded to additional sites (such as OK, KS, NB, ID, UT, WY, OR and WA). Preliminary data suggested that at some geographic point the *Scolytus* species infesting elm has shifted from the old invasive (*S. multistriatus*) to the new invasive (*S. schevyrewii*) and by the time it gets into the Rocky Mountain region the newer species appears to have extirpated the original.

Future collaboration with the North-Central Nursery IPM Working Group. The NC Nursery IPM Working Group is funded by the NC Region IPM Center, and include several horticulturists, pathologists and entomologists in the region, with the goal of fostering and promoting IPM practices in nurseries. There are significant overlaps between NCERA-224 an NC Nursery IPM Working Group; therefore, project collaboration, cross-pollination of members, and joint meetings are possible between the two groups. NCERA-224 members at Purdue University and Michigan State University had been tasked to establish connection and discuss potential collaboration on behalf of NCERA-224.

Potential collaborative project: Pesticide Summary Sheet

Janna Beckerman introduced the NCERA-224 working group to Pesticide Summary Sheets developed by Jason Deveau of OMAFRA. The summary sheets contain information from the labels presented in an organized and easily understood manner, which will allow growers to use the products more effectively and safely. This working group may be able to produce similar summaries, but focus on the most commonly used pesticides in the nursery and landscape industries. The working group thought the idea has merit as a collaborative project for the working group, and tasked Janna Beckerman and JC Chong to develop ideas on pursuing the project.

Potential collaborative project: Blue spruce decline

Monique Sakalidis provided a report on the survey of blue spruce decline during the state report session. Assistance in collecting suspected samples of blue spruce decline from the BCERA-224 members is requested. The sampling protocol will be developed and disseminated by Monique Sakalidis. The project may have potential for research grants.

Potential collaborative project: Trunk injection for the protection of conifers

Joe Aiken of ArboJect gave a presentation on the efficacy of injecting trees for the protection from insects and diseases, which is an application method that is increasing in popularity. However, conifers have often been difficult to inject because resin can plug the injection tubes. An alternative injection timing is in the spring, when temperature is between 40-45°C, which can reduce resin flow. David Smitley proposed to the group to conduct a collaborative study on evaluating the efficacy of trunk injection of conifers for management of various major insect pests and diseases. This project has potential for generating grant funding. David Smitley will continue to develop project ideas for the working group.

Brian Kunkel was nominated by Dave Smitley for the position of Chair (2019), and the nomination was seconded by Janna Beckerman. Brian Kunkel was elected the Chair of NCERA-224 unanimously.

The location for the 2019 annual meeting was discussed and two locations were nominated: Puerto Rico and San Diego, CA. JC Chong and Brian Kunkel will provide the membership with more information. Members will be polled for their preference between the locations. Meeting is tentatively scheduled for the second week (9-10) in December 2019.

Continuing efforts will be made to recruit new members and to re-enlist previous members. Attendees who are not yet official members of the working group were urged to work with their Experiment Station Directors to enlist.