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# Research Update



HRI

Horticultural Research Institute

the research affiliate of



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# Pollinator Research Update

*Note: The following two articles appeared in AmericanHort's Washington Impact electronic newsletter during June, 2015.*

## Horticulture Industry-Funded Pollinator Research Underway

*By Jennifer Gray*

The Horticultural Research Institute, in collaboration with AmericanHort, established the Horticultural Industry Bee & Pollinator Stewardship Initiative in 2014. One of the primary goals of the Initiative is to identify and fund research that will help answer key science questions and fill gaps needed to inform, design, and refine an industry stewardship program. The Initiative's focus on research is a key component in establishing a clearer understanding of horticulture's impact on pollinators.

One researcher who received project funding this year is Dr. Richard Cowles, Connecticut Agricultural Experiment Station (Windsor, CT). Dr. Cowles is analyzing pesticide residue in pollen and nectar on neonicotinoid-treated plants. Using plants commonly used in the landscape, Cowles expects to further develop an understanding of systemic insecticide uptake and potential interactions with nectar and pollen. Why is this important? Currently, there are significant gaps in data related to the concentration of systemic insecticides in pollen and nectar. Establishing whether treated plants (when treated properly) are safe to bees and other pollinators will aid in setting stewardship standards for growers and assist in educating retail sellers and consumers about grower practices.

To date, Cowles has embarked upon dose-response tests on minute pirate bugs, using neonicotinoid insecticides and their suggested replacements. An early goal for the project is to establish whether the pirate bugs can be utilized in the bioassays (i.e.: can the team quantify the insecticide residues in the pirate bugs). His team is further investigating the active ingredients, application methods, and application timing relative to flowering as factors that may influence the residues found in nectar and pollen of ornamental plants.

A second project underway is led by Dr. Daniel Potter of the University of Kentucky (Lexington, KY). Dr. Potter and his team are working to identify best management practices by which producers and landscape managers can protect plants from pests while simultaneously mitigating risks to bees. His research also has the potential to support planting recommendations for landscapes that sustain bees throughout the growing season, identify plants that warrant particular caution when using systemic insecticides, and highlight plants whose floral characteristics reduce the potential for bees to be impacted by systemic insecticides.

Potter's team has already implemented work to assess the extent and longevity of translocation of soil-applied imidacloprid and dinotefuran into nectar and pollen. Flowers from early-blooming species in the project were collected, bagged, and transported to a lab where anthers with pollen were removed from each flower by forceps. Flowers were spun in centrifuges to remove nectar. Samples are stored until all three plant species in the project have been sampled. From the lab, they will travel to be analyzed in a blind review for insecticide residues.

Potter's team has also begun work to document bee assemblages (types of bees, bee species richness and diversity) associated with numerous species of flowering woody ornamentals, and to rate/rank those plants in terms of attractiveness to bees. To achieve this, bees are being sampled from approximately 40 species of common flowering trees and shrubs across multiple sites. Bees are netted, preserved, coiffed in a fan-driven bee drier, pinned, labeled, and identified. Comparisons are being made between native and non-native plants, trees versus shrubs, and plants having particular sets of floral characteristics. This is one of the most extensive pollinator surveys ever done on woody plants and, when completed, will form the basis for science-based recommendations for bee-friendly landscape plants.

Three additional pollinator research projects are also underway this year; two receiving funding through HRI's pollinator initiation, and one receiving funding through HRI's traditional research grants program. Updates on these projects will be featured in upcoming issues of *Washington Impact*. For additional information about these projects, or any of the several dozen HRI-funded projects currently in progress, please contact Jennifer Gray at 614.884.1155 or [Jenniferg@americanhort.org](mailto:Jenniferg@americanhort.org).

## Work Continues on Pollinator Health Research

*By Jennifer Gray*

The Horticultural Research Institute, in collaboration with AmericanHort, continues to directly fund and leverage research to refine science-based guidance on horticultural practices and protecting bee and pollinator health. As part of the broad-based Horticulture Industry Bee & Pollinator Stewardship Initiative that includes industry and consumer outreach and the establishment of industry best practices, the Horticultural Research Institute has directly funded four important research projects. These projects are a continuation of HRI's longstanding commitment to fostering new information relevant to horticultural practices, techniques, and principles.

The involvement of HRI and the horticultural industry in pollinator research is essential toward fulfilling

the industry's role in supporting healthy pollinator populations. Horticulture provides the very thing pollinators need to thrive: abundant sources of forage. HRI is hopeful that these and other ongoing projects result in helpful best practices guidance for growers, retailers, and landscape professionals.

"Critical research on diverse aspects of pollinator health is at the core of our initiative's success," states Craig Regelbrugge, Senior Vice President—Industry Advocacy and Research. "Investing in new knowledge now will assist our industry to meet current and future challenges with accurate, science-based facts rather than emotion and opinion." Here are progress reports on two of the HRI-funded studies.

Dr. Victoria Wojcik, from the Pollinator Partnership (San Francisco, CA) and Dr. Christina Grozinger (Penn State University, University Park) are working to understand the opportunities present for bees from common commercially-available plant material. This work seeks to help us better understand the interactions of bees with landscape plants in order to know which specific cultivars and varieties bees most frequent. This project will guide treatment protocols for specific plants and help the industry in marketing particular varieties that are most advantageous for pollinators.

“Bees are a diverse group that have unique floral preferences. There are a diversity of ornamental plants produced, sold, and planted each year,” notes Wojcik. “Our study will identify plants that are commonly planted and preferred by bees in order to provide the horticultural community with an understanding of how they can focus on production and distribution of the best plants to help support pollinator forage.”

In the first stages of work, the researchers will collect data on plant sales and distribution in key geographic areas. The information gathered will guide the researchers in framing their work to understand regional foraging preferences. The HRI grant supports work that is part of a larger USDA-APHIS grant (\$272,000) that focuses on identifying opportunities and threats to pollinators in commercial horticulture by understanding the chain of custody and plant protection practices as they related to pollinator usage of these plants.

A second project led by Dr. David Smitley (Michigan State University, East Lansing) aims to identify scientifically-based best management strategies for growing bee-friendly plants in the greenhouse. Smitley’s team is running concurrent experiments on hanging baskets and potted plants. Smitley’s research will determine if standard practices could be harmful to pollinators and, if so, will assist in developing pollinator-friendly alternatives.

Smitley is researching residues of insecticides on hanging baskets and potted plants after they are shipped and sold. His work will shed light on whether plants that are treated, shipping, and sold have pesticide residue levels of concern by the time they reach a consumer’s patio.

The early stages of this research are well underway, with soil drenches of imidacloprid or another neonicotinoid insecticide applied to hanging baskets and foliar sprays of a neonicotinoid or pyrethroid insecticide applied to potted plants in a carefully timed experiment that mimics the timing of these applications in commercial settings. Flowers from plants will be collected to measure residues. Bees will also be collected and analyzed for exposure measurements.

“Growth of the plants has been timed, and final pinches will be made so that all plants are flowering on the shipping date and will be of a size and condition that is standard for greenhouse growers,” shares Smitley. “Flowers from all plants will be collected at one week after ‘shipping’ for a dislodgeable residue analysis. A standard analytical chemical procedure for detection of dislodgeable imidacloprid residue from the sprays will be employed. In addition, bees will be collected at one and three weeks after the exposure period to determine the amount of imidacloprid in their bodies.”

Three additional pollinator research projects are also underway this year; two receiving funding through HRI’s pollinator initiative, and one receiving funding through HRI’s traditional research grants program. Updates on all of these projects will continue throughout their duration. For additional information about the pollinator projects, or any of the several dozen HRI-funded projects currently in progress, please contact Jennifer Gray at 614. 884. 1155 or [Jenniferg@americanhort.org](mailto:Jenniferg@americanhort.org).



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