

**CFAES**

# Integrated Pest Management

Program Highlights – 2018



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**THE OHIO STATE UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

**OHIO STATE UNIVERSITY EXTENSION**

# Greetings!

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**T**he Ohio State University Extension Integrated Pest Management (IPM) Program is pleased to share our achievements and accomplishments during FY2018. These highlights were generated from the second year of the USDA National Institute of Food and Agriculture Crop Protection and Pest Management competition under the Extension Implementation Projects category (2017-70006-27174).

Despite it being a tough agricultural year in Ohio, with heavy rains and flooding over much of the state followed by drought like conditions, our growers and specialists persevered, though it did reduce the number of field programs we normally conduct. One of the bright successes was the continued establishment of over 50 pollinator habitat plantings around the state and at a few of our experiment stations, such as the one I'm kneeling in pictured on the opposite page.

The IPM program functions as a multidisciplinary team relying on specialists and Extension educators from several Departments to address the needs of our stakeholder groups which help multiply our outreach efforts. Our collective mission is to increase the adoption of IPM principles and practices of all citizens across commercial scale, small farm, and urban food production systems, including homeowner and community-based programs.

This brochure highlights the scope and breadth of our IPM projects in Agronomic Crops, Specialty Crops, Pest Diagnostic Clinic, Pollinator Health and Community IPM but by no means captures all of the IPM research and Extension efforts at The Ohio State University.

I hope you enjoy perusing the highlights and accomplishments of our IPM team. Please feel free to contact any of the collaborators listed in this brochure or myself for more details about any of the projects.

Respectfully,

**James R. Jasinski**  
Associate Professor  
Department of Extension  
IPM Program Coordinator



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Cover: Syrphid fly on marigold flower; photo: iStock





# Mucking Around with Pollinator Habitat

Elizabeth Long, Department of Entomology

**I**n late July, about 40 extension educators, members of general public, commercial vegetable producers, university students, faculty, staff, and representatives from local and state government attended a muck crops field day at the Ohio State Research Station in Willard, OH. The field day serves to highlight research in the areas of entomology, plant disease, and weed science that have implications for IPM strategies used in commercial production of muck crops. It is also a venue to demonstrate differences in production and yield outcomes of plots managed using various IPM strategies. On this date, demonstration plots of native wildflowers were highlighted for their ecological value of providing resources to beneficial insects, reducing wind erosion of muck soils during off season, and their aesthetic value by diversifying colors and textures provided by flowers in the margins of the landscape, which would otherwise have to be sprayed with herbicides for weed management.

In a short evaluation of the topic, 75 percent of respondents (n=8) would be at least moderately likely to install some pollinator habitat on their farm if the cost of the seed were reimbursed. In a more general statement about creating pollinator habitat on their farm, 75 percent were at least moderately likely to perform this action.

# Creating and Supporting Demonstration Pollinator Gardens

Denise Ellsworth, Department of Entomology

Our ongoing work in the pollinator health arena from 2018-2019 has been to increase the number of pollinator habitat sites focused educational and demonstration gardens across the state. All of these 68 sites were supported with Ohio native perennials, signage and training support. These gardens are located at Ohio State University Extension offices, metro parks, fairgrounds, community gardens, and other public sites. Many of these gardens were developed by (and are maintained by) Ohio State Master Gardener Volunteers, Ohio Certified Volunteer Naturalists and Volunteer Pollinator Specialists. Four hundred fifty flats of native perennial plugs (approximately 16,000 plants) were grown and distributed in 2019. The perennial plants are native to Ohio, and many are grown from Ohio-collected seed.

Fifty-one sites in 31 Ohio Counties received native perennial plants in 2019 to create or support existing pollinator habitat. Native plants that support specialist bees were featured in this year's plant distribution along with signage about specialist bees (these native bees can only collect pollen from specific plants). The goal of this effort is to increase knowledge about plants and nesting habitat for pollinators, and to create a patchwork of habitat to support native bees. Next year's plant distribution will focus on plants suited for urban areas, including smaller native perennials and pollinator-friendly herbs.





# Protecting Pollinator Health

Denise Ellsworth, Department of Entomology

**B**ees are all the buzz! Scientists have been concerned about honey bees, bumble bees and other essential pollinating bee species for years, and now Ohio farmers, gardeners, naturalists and others are enthusiastically working to learn about and conserve these important animals. With the listing of the rusty patched bumble bee as an endangered species in 2017 (and probable additional bumble bee listings in the near future), attention has turned to observing and mapping all bees across Ohio.

Through public bee biology workshops, identification workshops and intensive volunteer training, hundreds of observers have been trained to use the free iNaturalist app to document sightings of bees in Ohio via the Ohio Bee Atlas project. Preliminary results from the Ohio Bee Atlas and the Ohio Bumble Bee Survey were shared at The Ohio State Pollinator Summit in 2019 at the 4-H Center in Columbus. This one-day workshop, attended by 126 participants, focused on bee biology, identification and conservation. Attendees included conservationists, researchers, graduate students, agency employees, naturalists, gardeners, Extension employees, volunteer pollinator specialists and others.



# Observe Bees: Become a Dandelion Detective

Mary Gardiner, Sarah Scott, Kayla Perry and Denisha Parker,  
Department of Entomology

**T**he Gardiner Lab has launched Dandelion Detectives, a youth-focused citizen science program aimed at measuring the value of weeds for bees and other insects. Dandelion Detectives is designed for youth in grades 3-7, and offers individuals, school groups, and organizations such as 4-H clubs the opportunity to participate in this collaborative scientific study. Each detective will establish an “Observation Dandelion” consisting of yellow funnel live trap with a sugar-water soaked sponge and record and release all insect captured after a six hour period. Participants will also measure the richness of blooming weeds (or lack thereof) found in their yard and interview their parents about lawncare practices.

During 2019, the Gardiner Lab developed and tested the Dandelion Detectives protocol. We produced a step-by-step workbook, insect identification guide, weed identification guide and toolkit of materials to measure insect and weed abundance. We also designed a pre- and post-test survey and online data entry interface to compile all project findings. Dandelion Detectives will be open to youth nationwide during the summer of 2020. More information and instructions on how to register can be found on the Dandelion Detectives Website ([u.osu.edu/dandeliondetectives](http://u.osu.edu/dandeliondetectives)).





# Invasive Pests Workshops

**Celeste Welty**, Department of Entomology

**Jim Jasinski**, Department of Extension

**T**he IPM program offered several events to prepare specialty crop growers for managing new invasive pests. The focus was on two invasive pests that have already been causing damage on fruit and vegetables in Ohio: the spotted-wing *Drosophila* and the brown marmorated stink bug. Information was also provided on one potential invasive pest that has not yet been detected in Ohio: the spotted lanternfly. A one-hour webinar was presented in March that covered all three pests, with emphasis on how to monitor them, and an overview of management tactics. A survey of attendees included the question ‘How helpful was the IPM information presented during today’s webinar for your farming operation?’ to which 67 percent replied it was very helpful, and 33 percent replied that it was extremely helpful. A second webinar was presented on 24<sup>th</sup> April for several Master Gardener Volunteers who had been recruited to assist with monitoring spotted-wing *Drosophila* in counties where we had no previous data on its occurrence. Both webinars were recorded and posted online at the Ohio State IPM YouTube site; the Master Gardener video has been viewed 39 times in the three months after it was posted.

About 15 growers attended a workshop in February conducted at the Ohio Ecological Food and Farm Organization’s annual meeting where the pros and cons of using non-treated exclusion netting to keep SWD away from small fruit plantings were presented. At the end of the presentation, audience participants were recruited to construct a small-scale version of the exclusion netting system over a table top. A video featuring the grower who designed and built the netting tunnel structure was produced and posted on the Ohio State IPM YouTube site ([youtu.be/\\_eAODdcYnXk](https://youtu.be/_eAODdcYnXk)), where it has been viewed 251 times in the 10 months since it was posted.



# Pumpkin Field Day

SPECIALTY CROPS

Jim Jasinski, Department of Extension

Celeste Welty, Department of Entomology

This year 28 growers celebrated the 20th annual pumpkin field day held at the Western Agricultural Research Station in South Charleston with our outreach team! Despite beginning the season wet which delayed planting, growers generally agreed their crops looked about average compared to other years, some even predicted better than average yields. This year's jack-o-lantern field day had some traditional topics like the powdery mildew fungicide demonstration trial and a 27-entry variety trial showcasing newer powdery mildew tolerant pumpkin and squash hybrids. A grower with decades experience with cover crops talked about how to use different cover crop combinations for weed and disease management. We also had a demonstration trial using biostimulants to enhance plant growth and yield. The highlight research project investigated using mustard cover crops as a biofumigant to reduce a significant soil borne disease, *Plectosporium* leaf blight, on pumpkin foliage and fruit. The steps included planting the mustard cover crop, followed by mowing, rototilling, packing and then sealing the soil with water to allow the biofumigation process to work.

Field day participants were asked to evaluate what they learned at the field day, and over 95 percent learned something useful about managing insects and diseases (n=21). Overall 75 percent of respondents use powdery mildew hybrids on their farm per our recommendation and 42 percent strongly agree that what they learned today will help them manage pests on their farm. About 65 percent stated they were very likely adopt at least one tactic they learned at the field day.





# Hop Growers Participate in Workshops

Brad Bergefurd, Charissa Gardner and Thom Harker, Department of Extension

**H**ops is still a relatively new crop to Ohio with many new growers and experienced growers continuing to pursue relevant means to identify and manage these pests. Thirteen hop workshops and field days were organized throughout Ohio from September 2018 - August 2019 to provide unbiased research information to growers who are increasing their acreage to meet the growing demand from Ohio's 300 plus craft breweries. These workshops are organized, planned and scheduled with the Education Committee of the Ohio Hop Growers Guild and the local Extension Educator to teach growers, brewers or anyone with an interest in hop production, the importance of pest management and identification for a successful hops farm. At these workshops horticulture, disease management, weed control and insect control specialists teach integrated pest management techniques including site preparation, trellis construction, plant and field maintenance, pests and natural enemies, harvesting methods, and marketing. Grower participation is high during the question and answer periods at all workshops and field days.

In post-workshop evaluations, participants reported an increased confidence after the workshop to correctly identify and manage spider mites and downy mildew (n=16). Participants also had increased confidence to use IPM strategies to reduce other insect and disease injury in hops. Sixty percent of participants reported being moderately likely, very likely or extremely likely to use at least one of the IPM tactics discussed at the meeting, while 50 percent of participants reported it was very likely or extremely likely what they learned would save their operation money.

# Urban Agriculture Workshops in Greene County

Jim Jasinski, Department of Extension

**U**rban agriculture continues to expand throughout Ohio in larger cities such as Cleveland, Columbus, Cincinnati and Dayton, but even smaller cities are providing education and resources for local food production and programs. Two workshops in Greene County helped educate local growers and teachers on how to get started in this area. The first workshop was held in late March and had 29 participants, mostly growers and Master Gardeners. The topics were about basic season extension and pest management in high tunnels, low tunnels, and raised bed row cover systems. The second workshop called Project Greene Teachers was held in early June for 14 K-12 teachers who wanted to learn how to construct raised beds and discover programs related to gardening and pest management for youth. During the workshop, participants made a series of raised beds, installed plants and drip irrigation, and then attended a few presentations about pest management, pesticides, and insect identification. Several garden project oriented curriculum were provided to the teachers for use at their schools.

Participants were evaluated after the workshops concluded. For the teacher's workshop, 83 percent learned a great deal about cultural aspects of IPM, 67 percent learned a great deal about biological control, and 58 percent learned a great deal about pesticide use in IPM (n=12). Overall, 91 percent of respondents found the IPM information delivered to them very or extremely helpful for use in their classroom. For the season extension workshop, 45 percent of respondents found their knowledge of managing pests in those structures increased a moderate amount (n=24). When asked how helpful the IPM information was to their farm operation, 34 percent responded very or extremely helpful.





# Increasing Public Awareness for Bed Bugs

Susan Jones, Department of Entomology

**B**ed bugs remain a scourge that afflicts humans worldwide and locally in Ohio. In 2019, we further diversified the media that we are using to disseminate useful information on these pests, producing two educational videos on bed bugs using funding from USDA NIFA to the Ohio State University Extension IPM Program. The first video, titled “Bed Bug Basic Tools and Tips for Home Inspection” is posted at the Ohio State IPM YouTube site ([youtu.be/tW2wE3CjGaw](https://youtu.be/tW2wE3CjGaw)). In this video, Alden Siperstein, research assistant in entomology, shows live bed bug life stages (eggs, nymphs, and adults) and their tell-tale signs, which include shed skins, fecal spotting, and live bugs. He discusses bed bug behaviors such as their tendency to group together in cracks and crevices in undisturbed sites, especially on the underside of items, so that viewers have a better understanding of where to inspect for bed bugs. He demonstrates the main tools and procedures to inspect furniture for bed bugs.

In the second video, titled “How to Modify a Vacuum to Remove Bed Bugs,” Dr. Susan Jones shows how to modify a portable vacuum cleaner to safely suck up and remove bed bugs from furniture or other areas of a room. She demonstrates how to use a nylon stocking inserted into a vacuum extension wand to create a disposable see-through bag for collecting and confining bed bugs. She demonstrates vacuuming to effectively remove bugs from furniture and then how to examine the stocking for captured bugs. Proper disposal of any live bed bugs caught in the stocking also is shown. This video is posted at ([youtube.com/watch?v=c3Gd7qYmp\\_c](https://youtube.com/watch?v=c3Gd7qYmp_c)). Both videos have been viewed a total of 481 times since being posted online. Members of the Central Ohio Bed Bug Task Force found both videos to be extremely useful, and at their request, the videos now are prominently displayed on their website.





# Helping Homeowners Grow Healthy Hosta's

Joy Pierzynski, Department of Plant Pathology

**A** hosta workshop on important diseases of this commonly used landscape plant in Ohio was organized in February 2019, as part of a larger hosta program for Ohio State Master Gardeners located in Greene and Montgomery Counties. The well-attended workshop was targeted toward new and experienced Master Gardeners in the identification of hosta diseases and their IPM management strategies. The workshop covered information on the history of the hosta plant, various uses in different countries, the disease triangle, three of the most important diseases of hosta, various symptoms and signs of the diseases at various stages, disease epidemiology, and a number of IPM management strategies aimed at reducing or preventing the spread of the diseases in the landscape. Many of the attendees were familiar with or had some knowledge of hosta plants before the program. This workshop helped develop basic disease knowledge and hosta-disease identification skills.

Participants were given an evaluation after the workshop had ended. Results of the evaluation indicate that 35 percent of participants (n=49) were very confident or extremely confident in their identification and management of disease X. Likewise, participants indicated they were very confident or extremely confident in identifying (37 percent) and managing petiole stem rot (35 percent). When asked how likely they were to use at least one of the IPM tactics presented from the meeting today, 92 percent said very likely or extremely likely.



# Plant and Pest Diagnostic Clinic

Joy Pierzynski, Department of Plant Pathology

**T**he C. Wayne Ellett Plant & Pest Diagnostic Clinic processed 827 samples for clientele during the second year of the IPM grant. The Clinic received both homeowner and commercial samples from 67 Ohio counties, plus samples from the surrounding states and California. The types of samples processed through the clinic included ornamentals and turf (72 percent), soybean cyst nematode and field crops (17 percent), insect identification (7 percent), fruit and vegetables (4 percent). In the summer of 2019, a video showing how to identify and manage *Rhizosphaera* needle cast of conifers was posted to the Ohio State IPM YouTube site and has been viewed over 40 times.

This year the Clinic began moving toward a more molecular-based approach in plant disease diagnostics by incorporating additional real-time PCR protocols for a faster turn-around time and definitive results for its clientele base. In addition, a plan is in the works for the Clinic to add DNA and RNA sequencing when essential and conclusive plant pathogen identification is needed. Currently, the Clinic sends isolated DNA from symptomatic plant tissue to the James Cancer Center in Columbus for sequencing.



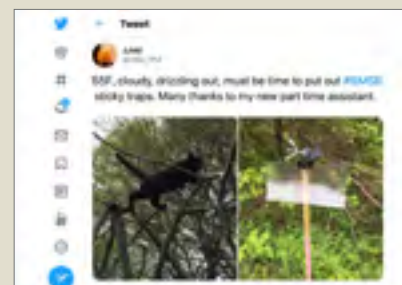
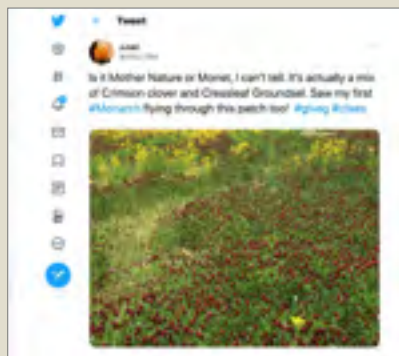
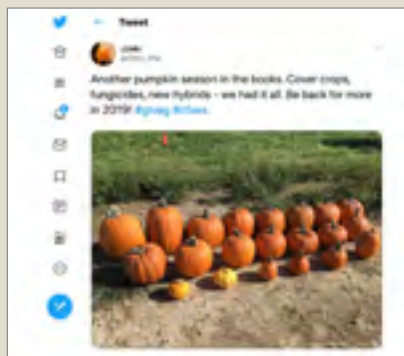
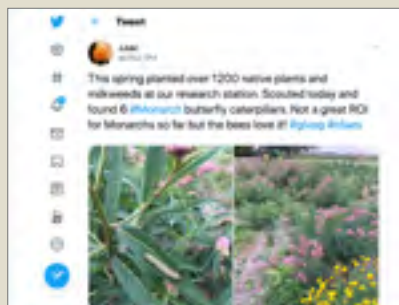
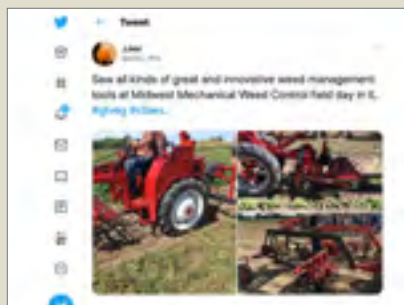
# Agronomic Crop IPM Activity Summary

**Kelley Tilmon, Andy Michel**, Department of Entomology  
**Laura Lindsey**, Department of Horticulture and Crop Science  
**Anne Dorrance, Pierce Paul**, Department of Plant Pathology

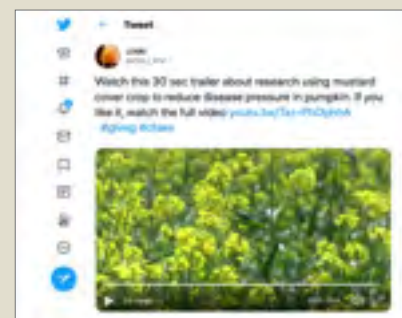
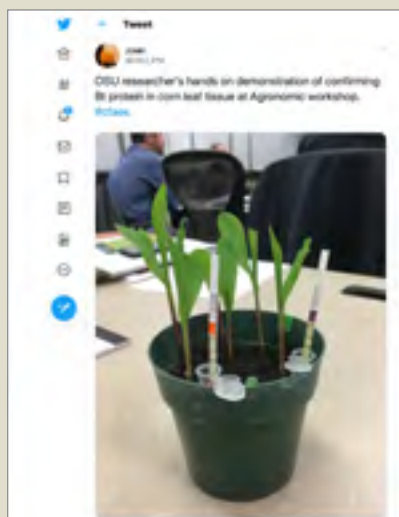
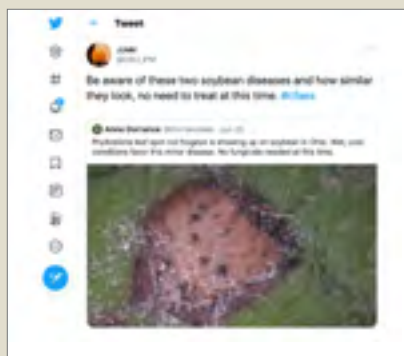
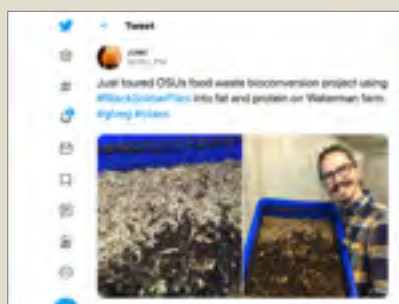
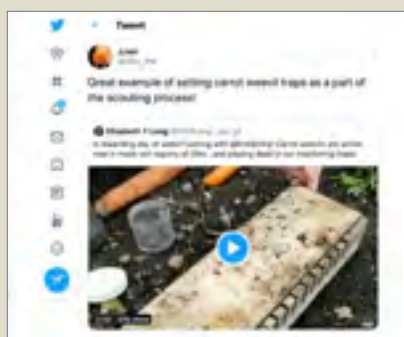
**T**he Ohio State Extension State Specialists in agronomic crops conducted a number of programs to promote integrated pest management in soybean, corn, small grains, and forages. Some recent highlights include on-farm collaborations with growers to assess Asiatic garden beetle, an emerging pest of corn; a monitoring program to detect the invasive Kudzu bug in Ohio, an introduced pest of soybean; an annual monitoring program to track the statewide prevalence of western bean cutworm, a pest of corn; monitoring for soybean cyst nematode in soybean; and in-depth crop workshops and field days for extension educators and growers.

Crop workshops were a highlight of 2019. The team conducted two winter Soybean Schools for growers. These all-day events provided in-depth information on soybean insects and diseases – their biology, and how to scout and manage them. They also provided two IPM Training workshops geared for crop advisors and extension educators, to train the trainers. These schools and workshops are designed for a smaller number of participants in order to provide personalized training and hands-on exercises as part of the program. For example, participants in both the Soybean Schools and IPM Training workshops worked through and exercise using pressed soybean leaves to learn how to accurately assess soybean defoliation and apply the information to management decisions. The agronomic crops team also provided training through the Small Grains Field Day where participants learned about pest management in wheat and barley.

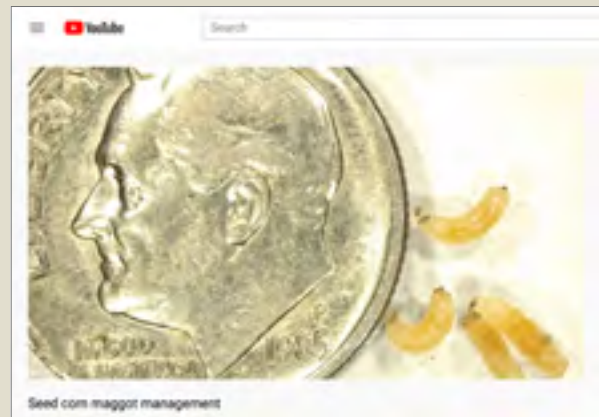




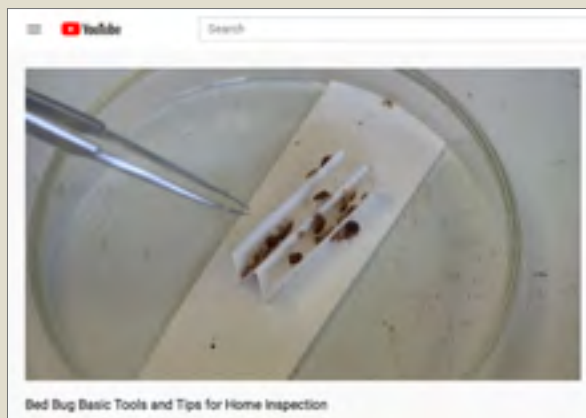
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This publication was printed on 100% recycled paper.



United States Department of Agriculture  
National Institute of Food and Agriculture

This project was funded by the USDA NIFA Crop Protection and Pest Management Competitive Grants Program (Grant number: 2017-70006-27174).

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