CFAES

SEPTEMBER 2022 – AUGUST 2023

Integrated Pest Management

Program Highlights – 2022

ipm.osu.edu

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

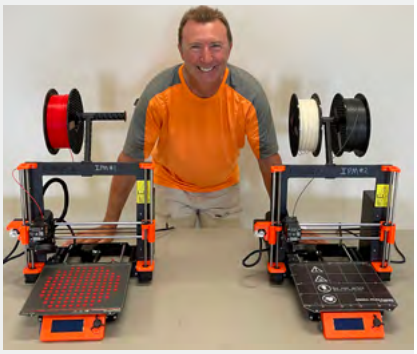
OHIO STATE UNIVERSITY EXTENSION

Greetings everyone!

We have just completed the second year of our three year cycle for the Extension Implementation Program and are knee deep across all our priority areas in extending IPM information and adoption across the state.

We are still working broadly in Pollinator Health, Specialty Crops, Public Health and Agronomic Crops to serve a diverse stakeholder audience. We also support the work of the Plant Pest Diagnostic Clinic which is now under new leadership to chart a steady course for the future. We added two new members to the IPM team including an agronomic crops plant pathologist and emerging crop specialist working to help us reach newer audiences across the state.

New initiatives and points of pride within the IPM program would be advances in our 3D printing capability to conduct more engaged teaching using insect models, Plant by Numbers garden plans to give pollinators of all stripes a healthy boost and conducting oilseed sunflower trials to understand the production cycle and pest dynamics of this potentially new crop. We have also added 12 videos to the IPM YouTube library on topics including bed bugs, tick safety and crop specific pest management.



As you peruse these highlights, I hope you get a broad sense of the diversity and scope of our programs as we strive to serve our stakeholders through hard work and innovation. If you have any questions about our current program offerings, feel free to contact the individual collaborators or myself directly.

Respectfully,

James R. Jasinski
Professor, Department of Extension
IPM Program Coordinator

Contents

Cover photograph: Ellen Danford

Pollinator Habitat 101

Denise Ellsworth – Department of Entomology

This five session webinar series featured 60-minute sessions by pollinator highly regarded biologists in autumn 2022. Topics covered included:

- Pollinators' Best Hope: A New Approach to Pollinator Habitat That Starts in Your Yard
- Creating Pollinator Gardens: The Role of Plant Choice and Design
- Creating and Managing Habitat for Native Bees
- Deciding To Create a Pollinator Garden Is the Easy Step — What To Do Next?
- Getting Started with Wildflower Patches, Flower Strips, and Meadows.

The series attracted 8,668 registered attendees, including gardeners, bee biologists, naturalists, and pollinator enthusiasts. Over 4,000 participants attended each live webinar session, with each session recording receiving an average of 6,000 views on YouTube. Participants learned applied skills to develop and enhance pollinator habitat in gardens, landscapes, parks and other spaces.

Doug Tallamy
The University of Delaware

Harland Patch
Penn State University

Heather Holm
Author and Biologist

Matthew Shepherd
The Xerces Society for Invertebrate Conservation

Shana Byrd
The Dawes Arboretum

Plant by Numbers – Greening for Beauty and Bee Habitat

Ellen Danford, Denise Ellsworth, and Mary Gardiner – Department of Entomology

The Plant by Numbers Program provides gardeners with a template to create a garden that is attractive to both people and pollinators! We have created a Plant by Numbers gardens template aimed at providing forage for specialist bees, bumble bees and butterflies and moths. Three other garden templates are currently being designed to target other groups of insects. In the fall of 2022, we established 14 demonstration sites throughout the Columbus Metropolitan Area. During the spring and summer of 2023, we surveyed each garden to determine the abundance and species richness of wild bees that forage from each Plant by Numbers garden. We have found a high diversity of bees occupying the garden sites that could benefit from additional floral resources.

Location of garden does seem to matter. Sites in landscapes with a high degree of habitat fragmentation receive fewer bee visits than sites in landscapes surrounded by a higher concentration of green habitat. This illustrates that some urban landscapes are very challenging environments for wild bees, and targeted greening efforts are needed to improve habitat quality in densely built areas within cities like Columbus. Youth volunteers, Master Gardeners and community volunteers at each site have been instrumental in tending the gardens and collecting data. We will continue our study though the fall of 2023.

IPM Programming in the Plain Community

Frank Becker – Department of Extension

Working with the Plain and Amish fruit and vegetable growers provides opportunities for a range of integrated pest management work. Seasonality of fruit and vegetable production allows for certain topics to be covered in depth and reviewed before growers become busy with the growing season. This year, our programming worked with grower to evaluate and review their chemical storage practices during the off season. Unfortunately, often times agri-chemicals are not being stored properly, which presents challenges in pesticide efficacy and can also present challenges around resistance management. Chemicals may be allowed to freeze or be exposed to extreme heat. Too, the products may be sitting open for extended periods of time or may be several years old. All of these areas of concern have provided excellent opportunities for education on chemical safety, handling, and storage.

During the growing season, we had a great opportunity to work with growers on identifying and retaining beneficial insects and natural enemies. The 2023 growing season was outlined with hot and dry spells that provided conditions suitable for outbreaks of aphids, thrips, and mites. As a result, there were an abundance of beneficial insect species that were present in the fields. Crop walks and grower's meetings provided the perfect platform to work with growers on in-field identification of beneficial insects, as well as being able to identify signs of their presence, as in the case of "mummy aphids". Over 400 copies of the "Natural Enemy Field Guide", written by Mary Gardiner, Ben Phillips, Chelsea Smith, Celeste Welty and Jim Jasinski, were handed out to growers. Many Amish and Plain growers expressed that this was the first time that they were able to see photos of beneficial insects, identify their stages (such as the lady beetle larva) and be instructed on how to find the natural enemies as well as being thoroughly informed the services that they provide in regard to biological pest control.

Spotting the Spot In Ohio

Amy Stone – Department of Extension

In 2014, the Spotted Lanternfly (SLF) (*Lycorma delicatula*), a non-native invasive insect was found in the United States for the first time in eastern Pennsylvania. In 2020 the insect was confirmed in Ohio in Jefferson County in eastern Ohio. In August of 2023, the Ohio Department of Agriculture (ODA) released an updated map, illustrating the spread of confirmed SLF infestations in Ohio based on reports received from the public, producers and green industry professionals. These reports were made through the Ohio Department of Agriculture and the Great Lakes Early Detection Network (GLEDN) App.

Outreach efforts continue to engage and empower residents to look for and report signs of SLF utilizing displays at fairs, festivals and field days; educational programs; written articles, alerts and social media posts. 3-D printed images of egg masses, nymphs and adults have been incorporated into our outreach efforts as a simple visual, or an engaging activity where participants find the hidden SLF replicas produced by OSU's Department of Entomology to provide a hands-on experience both indoors and outdoors.

Pumpkin Field Day Highlights

Chris Galbraith, Jim Jasinski – Department of Extension
Ashley Leach – Department of Entomology

Pumpkins, and all the agri-tainment that surrounds them, remain high on the list that Ohio growers produce for wholesale or roadside markets as one of their last major economic boosts of the year. To keep on top of production trends and pest management strategies, both new and experienced growers attended the annual Pumpkin Field Day in South Charleston to learn about new approaches to producing this crop while managing pests and protecting pollinators along the way.

This year's field day highlighted weed control strategies that involve burn down, pre-emergent and post emergent herbicides, as well as a discussion of weed biology and identification. The dry spring this year brought out high levels of vertebrate pests like voles and mice that depredate seed and seedlings, so a wildlife specialist provided background on their biology along with tips for encouraging natural predation by hawks and coyotes. For most growers, from early to late season, insect pests like cucumber beetles and squash bugs present unique control challenges when pumpkin and squash plants are flowering and pollinators are buzzing about, so we recruited an entomologist to discuss their research on managing both during critical windows of the season. Lastly, there was a discussion on several plant diseases including powdery mildew control using both fungicides and PM tolerant or resistant hybrids via a demonstration trial for the growers to review. During the two-hour event growers were given the opportunity to mix with other growers from around the state as well as talk with specialists and invited speakers.

Managing Bed Bugs at School

Benjamin Philip – Department of Entomology

Every school day that students, teachers and educational staff travel from their homes to a school building, they may be unknowingly bringing bed bugs with them, as bed bugs are particularly good at hitchhiking inconspicuously from one place to another. This is why schools should be considered important "transportation hubs" for the movement of bed bugs and extra attention should be placed on disrupting their spread. Several easy steps can be done to reduce the chance that bed bugs infest a school or are passed among the children and adults in the building. To properly educate the adults in schools, a video titled "Five ways to reduce bed bug populations in schools" was developed and posted to the OSU IPM YouTube channel. These tips include correctly identifying the pest, conducting a thorough inspection, reducing clutter, separating student items, and treating items with heat. The benefit of employing these strategies is twofold; these are independent activities that anyone (including children!) can do, and these are generally low-cost or free.

In addition to creating the "Five ways to reduce bed bug populations in schools" video, presentations and engagement with the public such as Girls Scouts of the USA, elementary and middle schools (e.g. Columbus City, Liberty Union and Upper Arlington Schools) and the Pesticide Applicators attending Pesticide Safety Education Recertification Conferences. Furthermore, bed bug educational materials were distributed at several Entomology Department outreach events, including at the COSI Big Science Celebration.

Ticks and Tick-Vectored Disease Outreach

Tim McDermott – Department of Extension

Ticks and tick-vectored disease are a major public health threat for humans, companion animals, and livestock in Ohio. We have gone from one medically important tick twenty years ago to five today, including two new ticks in 2020. Ticks can vector viral, bacterial, and protozoal pathogens as well as have been implicated in an allergic syndrome where the affected can become allergic to non-primate mammalian muscle including beef, pork, lamb, and venison. Public health outreach on tick-vectored disease is needed to raise awareness on how we can keep ourselves and our families tick-safe. As of July 1st, 2023, we have had positive detections of Asian Longhorned Ticks in seven counties in Ohio, on both human and animal hosts. Outreach materials for different audiences were created in multiple formats including webinars, recorded class events, continuing education, fact sheet publication, and videos for social media.

Outreach on ticks and tick-vectored disease included an Extension Today television segment created in partnership with WCMH NBC4 Columbus, 4 videos hosted on the Integrated Pest Management YouTube site, publication in the eBarns Extension bulletin, a recorded webinar created in partnership with The Nature Conservancy that has been viewed over 1,960 times, and 28 events including: webinars, field days, conference presentations, and continuing education opportunities attended by 1,903 individuals in 15 Ohio Counties.

Diagnostic Clinic Updates

Francesca Rotondo – Department of Plant Pathology

The C. Wayne Ellett Plant and Pest Diagnostic Clinic, at The Ohio State University CFAES Wooster Campus, is part of the National Plant Diagnostic Network. The Clinic provides diagnostic services and support for plant and pest related problems for commercial growers (vegetable, fruit, hops, field crops and floriculture), commercial landscaping companies (tree care, landscaping management, and arborists), and residential gardeners (homeowner, backyard gardeners and landscape ornamentals). The diagnostic service is fee-based but a grant from Ohio Produce Growers and Marketers Association supports the sample costs for commercial fruit, vegetable and cut flower growers. For commercial and non-commercial clients, each diagnosis includes guidelines and pesticide recommendations for the management of the disease/pest, focusing particularly on cultural practices.

From September 2022 to date, the Clinic processed a total of 668 physical samples of which 280 were landscape/ornamental, 150 were turfgrass, 130 were vegetable, 45 were fruit, 32 Insect identification, 16 field crops, and 15 cut flower. For the ornamental and tree diagnostics, there are three diseases that are closely monitored: vascular streak discoloration of red bud trees, oak wilt (on oak and chestnut) and boxwood dieback. For vegetable disease the first appearance of downy mildew in cucumbers, melons, pumpkins and squash is closely tracked as a disease of particular interest, along with powdery mildew. For fruit crops, *Neopestalotiopsis* disease on strawberry is also closely monitored. In addition to sample processing, the Clinic has taken part in extension activities including growers' meetings, crop walks, a diagnostic workshop for K-12 teachers, and diagnostic class lectures for the Plant Pathology Department.

SCN Sampling and Processing Video

Horacio Lopez-Nicora – Department of Plant Pathology

The soybean cyst nematode (SCN) remains the most devastating and yield-limiting soybean pathogen in Ohio and North America. SCN can cause over 30% yield reduction with no visible symptoms, therefore, early detection of this pathogen relies on testing your fields to know your SCN numbers! Spring is a good time to sample for SCN. A soil test in spring will reveal if SCN is present and if so, at what levels. Additionally, if you planted corn, a soil sample from that field will reveal if you have SCN but most importantly, how much SCN. Knowing your SCN numbers will help you determine the best management strategy.

With funding from NIFA via the IPM Program and the Ohio Soybean Council plus promoting the mission of The SCN Coalition, we will process up to TWO soil samples, per grower, to be tested for SCN, free of charge. If you are curious about how we process samples for SCN, we invite you to watch this video and learn how we process soil samples to collect and quantify SCN. Active management of SCN begins with a soil sample to detect its presence, then by knowing your SCN numbers, you can adopt an integrated management approach.

Video: How it's Done | Testing for Soybean Cyst Nematode

Monitoring Leps – Benefits Beyond Population Monitoring

Amy Raudenbush, Suranga Basnagala, Andy Michel and Kelley Tilmon – Department of Entomology

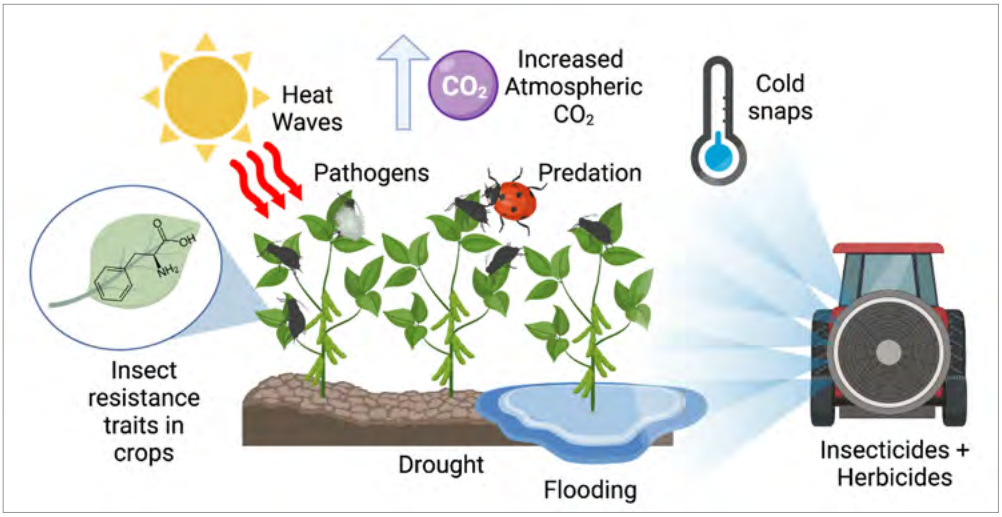
Last year (2022) was our first year expanding the agronomic crop monitoring network to include five caterpillar pests, in addition to the Western bean cutwork (Striacosta albicosta). The five additional pests included the black cutworm (*Agrotis ipsilon*), true armyworm (*Pseudaletia unipuncta*), corn earworm (*Helicoverpa zea*), European corn borer (*Ostrinia nubilalis*) and the fall armyworm (*Spodoptera frugiperda*). Monitoring for the adult moths of these caterpillar pests allows us prepare for potential pest outbreaks that may otherwise go unnoticed. These outbreaks may occur due to shifting weather patterns and the development of resistance to transgenic corn varieties. To monitor we deploy species-specific pheromone lures near corn fields, using either a wing trap or bucket trap, and monitored weekly from April through the end of September, depending on the life cycle of each pest. Moths are counted each week by a group of collaborators across the state of Ohio and uploaded to an online data sheet, which allows us to calculate averages for each pest in each county. The results are then published each week in the OSU Agronomy Team newsletter. In 2023, 14 counties monitored a total of 171 traps across the state for all the species in our monitoring network. An additional 13 counties and 49 traps were used to monitor Western bean cutworm.

There are a number of benefits from this pest monitoring network. Pest monitoring gives growers information that allows them to make the best management decisions for their crops. Sometimes that decision is to continue monitoring, employ more intensive scouting, or make a pesticide application. Another benefit of the monitoring network is increased communication among the county extension educators and the growers. Checking traps weekly allows the educators to communicate with growers in their county and teach them what pests are active at different times throughout the growing season. Lastly, the monitoring network has many educational benefits such as teaching five undergraduate researchers working in our lab about gathering data from a group of collaborators in Google Sheets, calculating results, and inputting data into ARCGIS software to make maps for the Agronomic Newsletter. Ultimately, the students learn to take the lead and write the newsletter articles, which includes a summary of the data collected from the previous week, background information on the pests being reported, and a map for each pest that shows the average pest number per county. Involving undergraduate students to take ownership of the newsletter has given them hands on skills that the students can take with them after their time in the Entomology Department and confidently use throughout their careers!

Climate Change and Pest Management

Aaron B. Wilson – Department of Extension

Interest continues to build in understanding how changes in climate, often manifesting in weather extremes such as record warm temperatures, higher humidity, and excessive rainfall, are affecting pest and diseases in agronomic and specialty crops across the region. To that end, the Agronomy Team hosted a webinar series in winter 2023 highlighting *Climate and Disease Management* featurimg Dr. Pierce Paul discussing the prediction of risk of vomitoxin in corn and its relationship to weather. The second webinar *Climate and Pest Management* featured Drs. Andy Michel and Maggie Lewis highlighting the Fall armyworm case study of 2021 as well as climate change implications for insect resistance management. Dr. Aaron Wilson added to each webinar a review of 2022 climate and an exploration of some of the climate tools available from the Midwestern Regional Climate Center (MRCC) and demonstrated the new MRCC Freeze Climatology Tool that allows users to investigate trends in spring and autumn freezes as well as growing season length. All 55 participants evaluated stated they learned new information, plan to use the information learned, and report an increase in their general knowledge of crop diseases and pest management.



Other highlights include a successful submission and acquisition of a USDA-NIFA Alfalfa Seed and Alfalfa Forage System Program grant to research the impact of Fall armyworm on alfalfa and forage and improve monitoring and extension information available for stakeholders. Additionally, woven into most engagement opportunities throughout the year such as field days, webinars and conferences, touched at least in part on the effects climate is having on insect migration, population, and overwintering of pests and diseases.

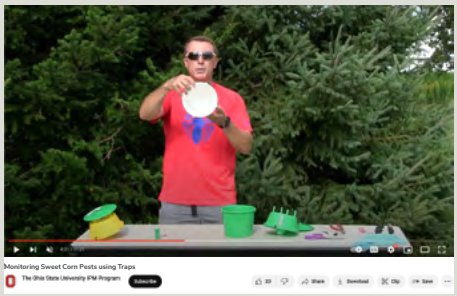
Is Sunflower Production in Ohio an Option?

Osler Ortez – Department Horticulture and Crop Science
Jim Jasinski – Department of Extension

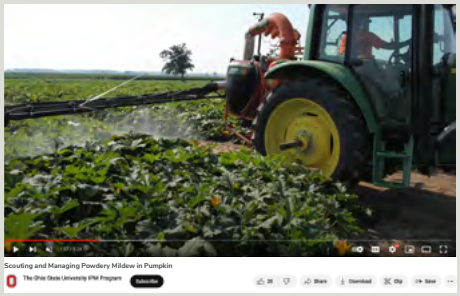
Sunflower production in Ohio environments can take place in two forms: full season crop (planted in May, just as one was planting corn or soybeans) or as double crop. The traditional double crop option in Ohio involves planting soybeans after wheat. However, other alternatives may become feasible within the crop system. In 2022, three field experiments were established to study sunflowers' viability as a double crop after wheat or barley harvest in Ohio. The study had three Perdue commercial high oleic sunflower varieties ranging from ultra-early maturity to mid-early maturity. As for any other agronomic crop, the selection of sunflower hybrids (or varieties) is one of the most important decisions in the process of growing sunflowers as a crop.

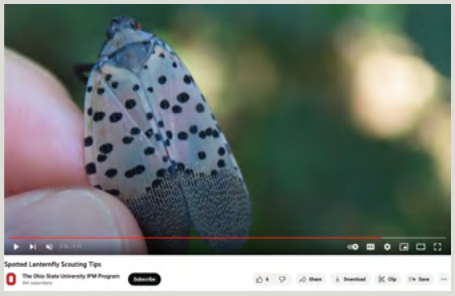
Yields for the double crop sunflower in 2022 ranged from 1,003 lbs/Ac to 2,740 lbs/Ac, results that are comparable to the U.S. sunflower yield average in recent years. Preliminary results showed that stand establishment varied across the three varieties and sites; low germination percentages led to lower stand counts and possibly limited crop yields. Other challenges included equipment availability (especially for harvest), harvest losses (due to shattering), bird damage (estimated 10 to 50% in one of the sites), and plant lodging in some plots. Additionally, there was evidence of a "head rot" disease at the Western location. Preliminary work to identify the pathogen suggests it is a fungus in the Alternaria genus known to infect sunflowers in other states. Major insect pests were not detected except for late season head feeding by Brown Marmorated Stink Bug. Black birds, finches and crows all fed upon seed heads prior to harvest for a 30-50% seed loss.

Videos recently added to the Ohio State IPM Library



Follow us on YouTube: **go.osu.edu/osuipm**





Follow us on X: **@osu_ipm**

IPM Program Personnel

IPM Program Coordinator

James Jasinski
Department of Extension
Specialty Crops
jasinski.4@osu.edu
937-484-1526

Department of Entomology

Denise Ellsworth
Pollinator Health
ellsworth.2@osu.edu
330-263-3723

Mary Gardiner
Pollinator Health
gardiner.29@osu.edu
330-263-3643

Andy Michel
Agronomic Crops
michel.70@osu.edu
330-263-3730

Benjamin Philip
Public Health
philip.12@osu.edu
614-292-8209

Kelley Tilmon
Agronomic Crops
tilmon.1@osu.edu
330-202-3529

Department of Plant Pathology

Francesca Rotondo
State Diagnostic Clinician
rotondo.11@osu.edu
330-263-3721

Horacio Lopez-Nicora
Agronomic Crops
lopez-nicora.1@osu.edu
614-688-0528

Pierce Paul
Agronomic Crops
paul.661@osu.edu
330-263-3842

Department of Extension

Frank Becker
Specialty Crops
becker.587@osu.edu
330-462-6303 Office

Brian Butler
Evaluation Specialist
butler.143@osu.edu
614-247-6524.

Tim McDermott
Public Health
mcdermott.15@osu.edu
614-292-7916

Mimi Rose
Director, Pesticide Safety
Education Program
rose.155@osu.edu
614-247-7489

Amy Stone
Specialty Crops
stone.91@osu.edu
419-574-0986

Aaron Wilson
Agronomic Crops
wilson.1010@osu.edu
614-292-7930

Department of Horticulture and Crop Science

Osler Ortez
Agronomic Crops
ortez.5@osu.edu
330-263-9725

Graphic Design: Brian Deep Art & Design

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: 2021-70006-35562).

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information, visit cfaesdiversity.osu.edu. For an accessible format of this publication, visit cfaes.osu.edu/accessibility.

The Ohio State University
College of Food, Agricultural, and Environmental Sciences