CFAES

# Integrated Pest Management

## Program Highlights – 2020

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

OHIO STATE UNIVERSITY EXTENSION

# *Greetings!*

The cover shot for this year's IPM highlight report was chosen intentionally. To me, the sunrise represents the dawning of a new day and hopefully the emergence from the heart of the pandemic which has changed our lives in so many ways. While it may be years before we fully get back to business as usual, it's a new start and I'll take it!

The fiscal year of 2020 (September 1, 2020 – August 31, 2021) is the fourth and final year in the Extension Implementation Program cycle and has seen our programming return to a bit of normalcy despite most of our educational events still being held virtually. Unfortunately some events were still postponed or canceled. On the positive side we have sharpened our presentation skills and learned how to conduct virtual programs more effectively but are certainly looking forward to meeting in person with our stakeholders soon.

In the spring of 2020 we recompeted for funding that would carry the IPM Program into August 2024. While we were successful in garnering funds, the review panel recommended a 30% cut which will affect our programming in Specialty Crops, Agronomic Crops, Pollinator Health, Public Health (Bed Bugs and Ticks) and support of the Pest Diagnostic Clinic. The cuts were an opportunity to rethink how we conduct programming more efficiently.

As we look to the future of the program and the diversity of stakeholders we serve, we recall our duty to protect people and the environment they live in while considering the cost of implementing all forms of pest management.

Respectfully,

**James R. Jasinski**
Professor, Department of Extension
IPM Program Coordinator
The Ohio State University

# Contents

# Pollinator Education and Demonstration Gardens across Ohio

**Denise Ellsworth** – Department of Entomology


Even though in-person events, workshops and field days couldn't take place because of Covid-19, our work to support the development and use of pollinator habitat education and demonstration gardens across the state moved forward. We were unable to grow and distribute our own native plant plugs as done in previous years due to social distancing limitations, so instead we partnered with Prairie Nursery in Westfield, Wisconsin to ship key native perennials directly to garden sites in spring 2021. Thirty-seven sites in 23 Ohio counties received shipments of 72 native perennial plant plugs as part of our "Great Plants, Great Networks" focus. These important native plants (such as penstemon, aster, milkweed and goldenrod) provide essential food and nesting habitat for birds, bees, butterflies and other beneficial species.

Seven of these sites have also installed small demonstration plots comparing the use of perennial cultivars versus straight species, in the hopes of educating and inspiring home gardeners to grow these plants in their own landscapes. All sites received signage to help interpret the importance of these native plants to visitors. A partnership with The Midwest Native Plant Society allowed for the use of artist Ann Geise's beautiful biodiversity illustration on the Great Plants, Great Networks sign.

# Online Webinars and Courses

**Denise Ellsworth** – Department of Entomology

Extension education has historically met people "where they are" to network and share research-based recommendations, whether that means a farm field, community garden or kitchen. Because of Covid-19, most everyone has been at home behind a computer screen, so our pollinator education workshops pivoted to a number of virtual offerings. Only a few are described below.

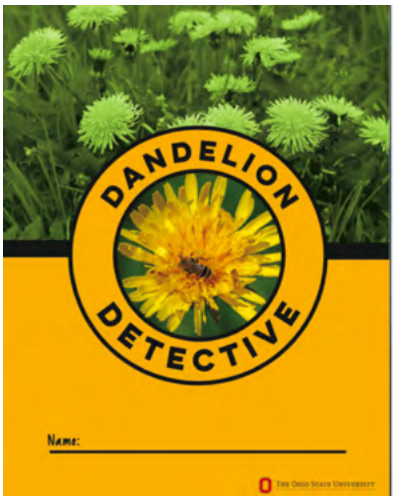
The One Day Insect University was modified from an in-person workshop to the One Week (Virtual) Insect University, featuring a nationally-recognized insect/pollinator speaker each day over five days. Each daily session averaged 380 participants.

Our "Welcome Spring! Authors Speaker Series" in March provided five daily webinars with 2,400 registrations per session and an average daily attendance of 1,200.

The Bee Short Course for Community Scientists is a monthly webinar series from May through November 2021. Over 3,000 participants have registered for this free course. The first three sessions saw live webinar attendance of 1,100 participants, with over 500 views of the recorded sessions.

# Dandelion Detectives – A Youth Community Science Program

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




Dandelion Detectives is a STEM activity targeting 3-7 graders where participants work together to measure the distribution of weeds in turf lawns and their attractiveness to insects across Ohio residential landscapes. Dandelion Detectives launched in the summer of 2020 and families could choose to participate by ordering a toolkit of materials though the mail or constructing their own by following DIY instructions and videos posted to our website (https://u.osu.edu/dandeliondetectives). Dandelion Detectives selected one day of their choice (June-August) to complete the study, which involved: taking a pre and post questionnaire about insects; observing insects at an "Observation Dandelion" created using simple provided materials and sugar water mixture; and conducting a lawn weed survey. Participating Dandelion Detectives were then able to upload their findings to a project website.

We distributed 115 Dandelion Detectives toolkits in 2020 and 116 kits to date in 2021. By catching ants, bees, beetles and flies within their Observation Dandelion, our Detectives deduced that all of these insects consume nectar from flowers. They also found that lawns contained several species of weeds that provide food for insects, with dandelions, white clover and narrow-leaf plantain being the most common. Dandelion Detectives interviewed their parent or guardian about their lawncare practices. Participating Ohio families mowed their yard an average of 3.9 times per month 33% applied both fertilizer and broad-leaf herbicides in 2020 and in 2021 participants mowed 3.3 times per month and 10% used fertilizer and/or broad leaf herbicides. Most participating families take care of their lawn themselves, while 10% hire a professional company. After completing our study (and potentially being pressured by a Dandelion Detective) we were thrilled to see that 100% of parents and guardians are willing to leave a patch of flowering weeds in their lawn for bees and other insects in both 2020 and 2021. When we asked our Detectives what they learned from participating in this community science program and responses included “weeds are important”, “insects other than bees feed on nectar”, “random sampling is important”, and “kids can contribute to real science experiments”.

# Spotted Lanternfly Outreach

**Amy Stone** – Department of Extension


Since its discovery in the fall of 2014, the spotted lanternfly (Lycorma delicatula) (SLF) has been on the radar for many Ohioans. The attention was ramped up as it was discovered in western Pennsylvania, and in the fall of 2020, when a reproducing population was discovered in Jefferson County in eastern Ohio along the West Virginia border. Just as with other invasive species, the engagement with the public is critical. Most often they are the ones that come across the invasive species and report what they have observed. This was the case in Ohio with SLF. A resident of Jefferson County learned about the spotted lanternfly via a social media post by the Agriculture and Natural Resources Educator in Jefferson County. Someone else showed him the insect that they found, he immediately recognized it, and reported the insect as instructed.

While ODA and USDA are actively managing the SLF population in Jefferson County, Extension continues to work on increasing awareness through programming both virtually and in-person, developing ongoing messages on social media, writing a SLF FactSheet and posting regular Alerts on the Buckeye Yard and Garden Line (BYGL), VegNet Blog, engaging Extension professionals and volunteers on monitoring tree-of-heaven (Ailanthus altissima) trees for the presence of SLF, along with the addition of SLF traps on highly favorable host trees in the 2021 season. Extension also is promoting the use of the Great Lakes Early Detection Network (GLEDN) App to report a suspect find in real time by using an App on a smartphone to engage a broader audience to be looking for SLF and other invasive species.

# Together at the Pumpkin Field Day

**Jim Jasinski**, **Aaron Wilson** – Department of Extension
**Tony Dobbels** – Department of Horticulture & Crop Science

Pumpkins continue to be a key fall crop for many growers who plant around 4,000 acres annually. After not holding a face to face pumpkin field day in 2020 due to Covid-19, this year's event will have some interesting topics to draw growers out and catch up on recent research and demonstration projects.

Highlighted at this year's field day will be a follow up of a pre-emergent Reflex herbicide trial conducted by Tony Dobbels in the Horticulture and Crop Science department. Dr. Aaron Wilson, Department of Extension & Byrd Polar Center, will give a brief overview of weather shifts affecting production in Ohio due to a changing climate. To cover disease issues, visiting scientist Dr. Dan Egel from Purdue University will be presenting on cultural and fungicide management of powdery mildew and downy mildew. Jim Jasinski, Department of Extension, will follow up with some comments on the pumpkin and squash germ plasm trial, powdery mildew fungicide trial, plus an integrated mustard cover crop and pollinator health project.

# Growing Ohio's Hop Industry Through IPM Education

**Brad Bergefurd** – Department of Extension


Market demand for Ohio-grown hops continues to exceed supply and brewers in the Buckeye State want more Ohio supply and continued high quality hops. Growers are learning pest management techniques through hop integrated pest management (IPM) education that can increase their hop crop yields and quality. In-person field days and winter conferences have been held previously to teach hop IPM techniques and to make farmers aware of new and emerging diseases and insect pests that can impact hop profitability.

In 2020 and early 2021, in-person education was replaced with online virtual field days and conferences. What traditionally was a three-day, in-person conference became a six-month virtual webinar conference, which highlighted different hop IPM and production topics each month with invited IPM specialists and farmers to share their hop IPM knowledge and experiences. Overall, growers reported the new online training format allowed for more participation from hop farmers, and with the sessions being recorded, added the flexibility to view the seminars at a later date or revisit a specific IPM session later in the growing season. In-person hop IPM field days and tours have resumed in 2021. Ten in-person hop farm tours and field days throughout Ohio were held on July 24 with more than 200 experienced, new, or beginning hop farmers participating. At these field days, growers shared their IPM techniques and participants were able to view first-hand symptoms of pest and disease issues that impact Ohio hops. "Without the hop IPM educational programming support of the OSU Extension IPM program, many more farmers would not have remained in the hop business the past 10 years, nor would they be increasing yields, acreage, and quality like they are today," said Dave Volkman, Chair of the Ohio Hop Growers Guild and owner of Ohio Valley Hops near Cincinnati, Ohio.

# Apple IPM Videos Part of Extension Certificate Course

**Celeste Welty** – Department of Entomology

An apple IPM curriculum is being developed for crop scouts and growers who want to learn how to implement IPM in apple orchards. The course is based in OSU's learning management system called Scarlet Canvas, which is designed for extension programs. The course includes modules on IPM topics that target people with a range of IPM experience. Topics for beginners include pest identification, how to monitor the most important pests by trapping and/or scouting, how to use monitoring information for decision making, and how to select IPM compatible pesticides. Topics for intermediate and advanced scouts are monitoring of natural enemies, monitoring of additional pests, behavioral control, how to enhance biocontrol, and how to use cultural and mechanical control tactics. Modules contain lessons as narrated slide shows supplemented with videos and summary documents, plus links to additional sources of information. In addition to being used within Scarlet Canvas, the initial set of 14 videos has been posted on the OSU-IPM YouTube channel (https://www.youtube.com/playlist?list=PL0HRPaZDLHyEHuEKnMYRkAFLaRKG3WV_s).

# Outreach in the Plain Community

**Frank Becker** – Department of Extension


Wayne County and surrounding counties are home to a large number of Amish families, many of whom grow fruits and vegetables, either for selling at farm markets, or at the area produce auctions. With approximately 1,500 active growers registered at either the Farmers Produce Auction in Mt. Hope, Ohio or the County Line Produce Auction in West Salem, Ohio, there is a large number of area specialty crop farmers who need to have access to information to help them make informed crop management decisions. Access to information such as insect and diseases updates is often absent in the Plain community due to the fact that they are a non-technology oriented community. This provides significant challenges when attempting to inform and educate growers about new diseases or insects that may be threatening their crops.

The auctions serve not only as an outlet for produce, but also as a hub for growers to communicate with each other. Taking advantage of a network that was already established, The Wayne County Integrated Pest Management Program and the Holmes County Extension Office installed bulletin boards at both of the area produce auctions. The bulletin boards are kept posted with relevant information and up to date recommendations. Pest and disease alerts are posted as well, such as alerts regarding Cucurbit Downy Mildew from the Ohio State VegNet newsletter, or Spotted Wing Drosophila information from the Regional IPM Centers National Pest Alert. Distributing hard copies of fact sheets, articles and recommendations provide the opportunity for information to be rapidly shared throughout the Plain community. Having resources available at the auctions that are accessible at all times have provided the opportunity for Extension to have an outreach even when no one is present. Establishing and strengthening relationships with the growers is essential to maintain the flow of information into these communities.

# Urban Agriculture Grow Light Station

**Trevor Corboy**, **Kim Hupman, Jim Jasinski** – Department of Extension

Extension educator Trevor Corboy and program assistant Kim Hupman have been slowly ramping up their capacity to work with urban agriculture and community garden growers in Greene County. While a bit hamstrung to conduct face to face programming during the Covid-19 pandemic, they have managed to organize workshops on raised bed vegetable construction and production plus an introduction to high tunnel production for local growers and school teachers interested in starting a demonstration vegetable garden at their school.

With the recent acquisition of two florescent and LED light fixtures attached to a wire rack growing stand, basic seedling production classes can be held during any time period when there is a need for plants but not enough natural light available for proper seedling development. The different types of lights will demonstrate current advances in lighting technology to produce healthy vigorous plants using a range of soilless media and seedling tray configurations.

# 360° Tours of Model Urban Farms

**Jim Jasinski** – Department of Extension
**Matt Kleinhenz** – Department of Horticulture and Crop Science
**Kip Curtis** – Department of History

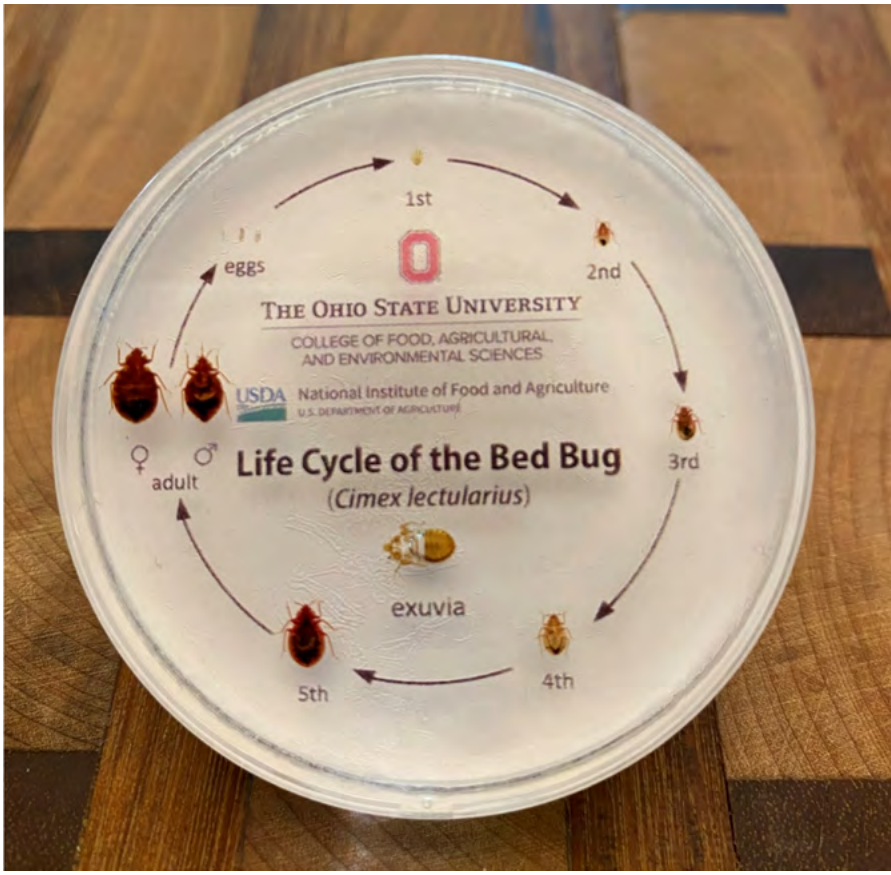
Trying to describe urban agriculture to people who might be interested in production inside and nearby city limits can be tricky given the variability between farms. So, instead of using words to describe these diverse operations, four model urban farms were selected to be imaged using 360 cameras to produce virtual tours. The purpose of these models is to illustrate how many combinations of in-field growing, raised bed production and high tunnel production are out there in working farms.

These model farms were located primarily in the north central part of the state and imaged in both the spring and during mid-season production to see the variety and rotations of vegetable planted. In addition to the actual tours, the manager or operator of the farm gave a brief introduction and history of the farm, including a purpose or mission statement. All eight models and interviews are posted online on the Urban Agriculture website (https://urban-extension.cfaes.ohio-state.edu/programs/urban-agriculture-and-natural-resources).

# Bed Bugs – Still an Issue in Ohio

**Benjamin Philip** – Department of Entomology

A proper IPM strategy requires an accurate identification of the pest. Many studies have shown that the general public is normally unable to properly identify a bedbug. A misidentification can lead to unnecessary treatments, needless expenses and exposure to insecticides. To reduce the disconnect between the public and bed bug identification, The Ohio State University has been a leader in providing valuable information to Ohioans through the OSU Bed Bug Website (https://u.osu.edu/bedbugs/), the Bed Bug Field Guide App (available for iOS and Android devices), and the Household Insect Identification Card (https://ipm.osu.edu/sites/ipm/files/imce/Household%20Insect%20ID-both%20sides.pdf). While the images and information in these resources are valuable, there is an added benefit to seeing real bed bugs when working to educate the public. Unfortunately, the obvious concerns about moving live bed bugs around for demonstration purposes would create added anxiety for most people and would not be conducive to a learning environment.




To reduce the concerns relative to live bed bugs, Dr. Benjamin Philip designed a custom display containing real bed bugs eggs, first through fifth instar larvae, male and female adults and exuviae (shed exoskeleton) imbedded in clear epoxy. The two-inch-wide round "pucks" are ideal for handling and close examination because they are durable and clear, minimizing the risk of damage to fragile preserved specimens on pins or in vials. County extension educators are frequently asked to identify potential bed bugs from fellow Ohioans. These bed bug life cycle reference pucks were distributed, along with Household Insect Identification Cards, to all Ohio County Extension Educator offices. Additionally, they contain both the Ohio State University College of Food, Agriculture and Environmental Sciences and The National Institute of Food and Agriculture logos to show funding support of this initiative.

# Pest Diagnostic Clinic Annual Report

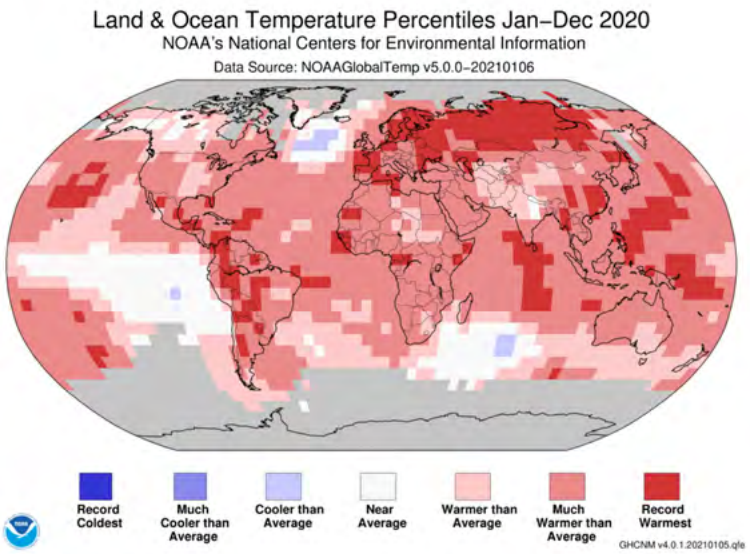
**Joy Pierzynski** – Department of Plant Pathology

The C. Wayne Ellett Plant & Pest Diagnostic Clinic processed almost 600 plant and insect samples for our clientele during 2020. The Clinic's clientele included commercial as well as homeowner from 68 of the 88 Ohio counties; we also diagnosed plant samples from PA, KY, NC, FL, and WI this past year. The processing of plant material this past year included Turf & Ornamental (70%), soybean cyst nematode and field crops (14%), insect identification (11%), and fruit & vegetable (5%). In addition, the Clinic continued to receive a higher-than-normal number of digital diagnostic requests. This is most likely due to Covid restrictions.

The past year saw the Clinic fully implement the portal for digital plant and insect submission, accessed through our webpage, for diagnostics with a quick turn-around time. The portal has been utilized by homeowners, many types of commercial businesses, city governments in Ohio area and the US Forest Service to name a few groups. It offers an easy way to send a sample for a person on the go or for someone that does most activities at home. It has been a successful addition to our operations. This past year the Clinic started diagnostics on a new Ohio commodity, industrialized hemp. While the Clinic cannot accept out-of-state hemp samples, we have been able to utilize the digital submission portal to communicate and diagnose hemp samples from beyond Ohio borders. The Clinic has continued to be involved in presenting diagnostic updates and participating in plant disease workshops in Ohio to Master Gardeners, green industry representatives, arborists, and horticulturalists. Timely and relevant Integrated Pest Management (IPM) cultural strategies are always presented at workshops and have become an integral part of messaging and recommendations to clientele whenever appropriate.

# Integrating Climate Information into Pest Management

**Aaron B. Wilson** – Department of Extension | Byrd Polar and Climate Research Center




Weather and climate are important factors to consider in pest management, with numerous ways to integrate information into programming. A recent review by the Food and Agricultural Organization of the United Nations, Scientific review of the impact of climate change on plant pests, highlights the unique pressure climate change poses on global plant health and food security as pest ranges continue expanding into new regions. Throughout Ohio and the Midwest, warming temperatures coupled with changing weather patterns are a growing challenge for those trying to stay ahead of pest pressure in agronomic crops. Research has already shown changing climate impacts on stink bug and Japanese beetle populations across the Midwest, with growing concern that conditions may soon permit overwintering of significant populations of corn earworm across Ohio. Virtual presentations, invited talks, and guest lectures in OSU Entomology and Horticulture classes were conducted during the year, discussing these climate change impacts on pests to educators, specialists, gardeners, students, and clientele throughout the state.

We assisted with in-season decision making on pests and management as well. As the occurrence of "false springs" (abnormally warm late winter/early spring conditions) increase, dormancy break and proliferation of early season pests emerge sooner than expected. Appropriately tracking growing degree days (GDDs) to stay ahead of the management of species like Alfalfa Weevil, and later in the season Western Bean Cutworm, are important. Working with Extension specialists in the state to provide this information through the OSU Agronomic C.O.R.N. Newsletter is vital to improving pest management in Ohio. We also continue to provide education through the Pesticide Safety Education Program for recertification, focusing on the impacts of temperature inversions on pesticide spray drift.

# Better Corn Insect Management with Better Monitoring

**Andy Michel**, **Kelley Tilmon** – Department of Entomology

For 15 years the Extension IPM Program in Ohio has conducted a corn pest monitoring network in 28 counties to monitor corn pests such as Western bean cutworm, European corn borer, true armyworm, fall armyworm, and corn earworm. Farmers receive weekly updates on pest activity via newsletters and our trapping website. This information helps promote integrated pest management by identifying high-risk areas and preventing unnecessary insecticide applications. This program has continued to evolve, with exciting new features recently developed by the IPM Program. We have integrated Ohio monitoring data with region-wide monitoring programs in the Great Lakes region including our Canadian neighbors. This allows for a more comprehensive regional picture and pest modeling efforts. Also, we are now collaborating with OSU climatologist Aaron Wilson to incorporate temperature data from weather stations around the state to model Western bean cutworm flight, with weekly updates on the predicted percentage of moth flight expected. Combined with on-the-ground trapping information these efforts provide powerful tools to help farmers maximize their scouting efficiency.

# Asiatic Garden Beetle Summit

**Andy Michel**, **Kelley Tilmon** – Department of Entomology

The annual Asiatic garden beetle (AGB) Summit was held via Zoom on February 4, 2021 to provide attendees with an update regarding ongoing AGB research in field cropping systems.

A total of 25 people, including university researchers, extension educators, industry representatives, and local stakeholders, attended from Indiana, Michigan, Ohio, and Ontario, Canada. In this summit the IPM program shared our most recent research and management information including the fact that grub and beetle densities are concentrated in the sandiest (>80% sand content) parts of the fields, regardless of previous crop. We also shared information on efforts to incorporate sampling data into Geographic Information Systems to develop prediction heat maps based on USDA soil survey maps, and the latest insecticide efficacy data. Stakeholders also learned about entomopathogenic nematodes (EPNs) which are being screened as a potential biological control for AGB grubs.

# Building a Better Slug Trap

**Andy Michel**, **Kelley Tilmon** – Department of Entomology

Slugs are an increasingly important pest of field crops, especially in no-till and cover cropped systems, but very little extension advice exists on monitoring and management. With support from the Extension IPM Program we have developed new and improved sampling methods for slug monitoring. We have demonstrated that a white shingle placed over a water-filled pitfall trap catches significantly more slugs than the traditional shingle alone. This provides a more sensitive monitoring tool for farmers wishing to track their slug populations.

# Virtual Corn College and Soybean School

**Laura Lindsey** – Department of Horticulture and Crops Science
**Andy Michel**, **Kelley Tilmon** – Department of Entomology
**Pierce Paul** – Department of Plant Pathology


Corn College and Soybean School was held virtually on February 11, 2020 in partnership with Ohio State University Extension Agronomic Crops Team. The all-day webinar included several IPM topics, 'Management of Gibberella Ear Rot and Vomitoxin in Corn with Fungicides' (Dr. Pierce Paul), 'Corn Insect Management' (Dr. Andy Michel), 'Soybean Management for 2021' (Dr. Laura Lindsey), 'Soybean Weed Control' (Dr. Mark Loux), and 'Insecticidal Seed Treatments' (Dr. Kelley Tilmon). During the webinar, there were 269 'live views' and 509 views on the AgCrops Team YouTube channel. 94% of the participants learned new information as a result of the program, and 94% also indicated that they plan to use the information that they learned during the program. Comments included, 'It was a timely refresher on many of the issues we face in agriculture,' 'All of the content was excellent and very relevant', and 'The fact that OSU has presented a first class virtual program is perfect for the present time. This program is getting the job done!'

Additionally, participants were mailed a give-away package, including a scouting calendar, eFields Report, soil thermometer, and field guide.

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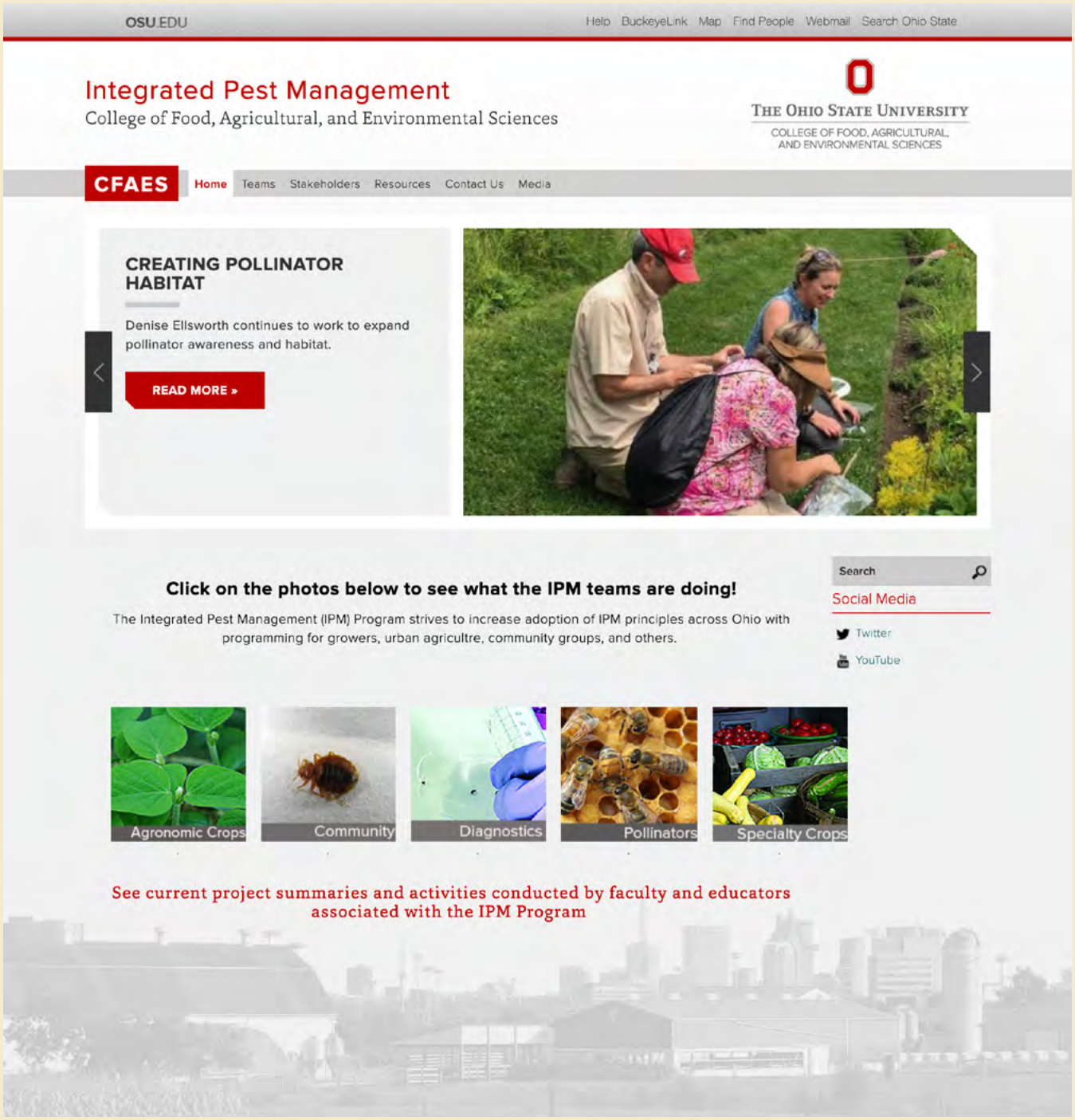

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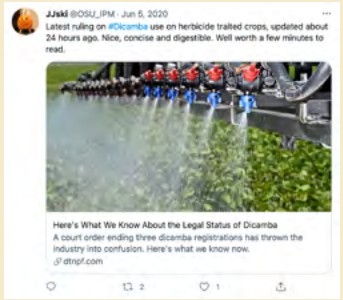










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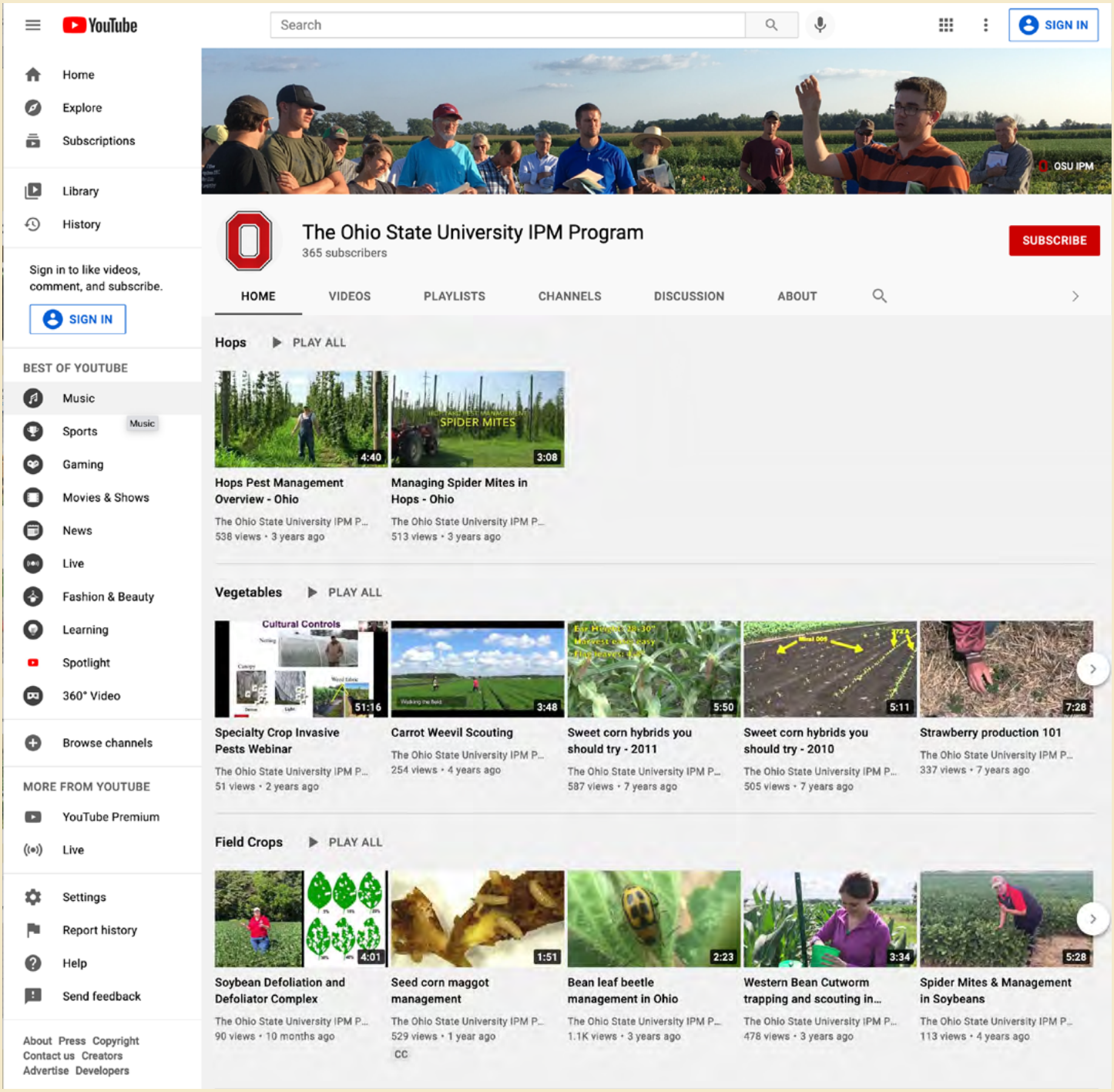

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