

<b>Title:</b>	<b>Ohio Extension Implementation Program 2014-16</b>		
<b>Sponsoring Agency</b>	NIFA	<b>Project Status</b>	ACTIVE
<b>Funding Source</b>	Non Formula	<b>Reporting Frequency</b>	Annual
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<b>Submitted By</b>	Wendy Michel	<b>Date Submitted to NIFA</b>	07/06/2015

**Program Code:** EIP

**Program Name:** Extension Implementation Program

**Project Director**

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**Recipient Organization**

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**Performing Department**

{NO DATA ENTERED}

**Co-Project Directors**

{NO DATA ENTERED}

**Departments**

{NO DATA ENTERED}

**Non-Technical Summary**

The Ohio State University Extension IPM Program Coordinator is James R. Jasinski and the administrative contact for the program is Keith L. Smith, Director of Ohio State University Extension. The OSU Extension IPM Program is a comprehensive program organized to encourage collaboration and innovation between OSU Extension, OSU Department faculty, and a multitude rural and urban stakeholders. The IPM Program is integrally connected with several Extension teams who strongly connect to stakeholders and help us gather input on our local direction and priorities. Members of the IPM Program have collaborations that span state, regional, national, and international boundaries. We feel we have a balanced yet flexible program that allows us to systematically respond to stated IPM Roadmap issues while being able to rapidly address emerging pest issues. We value traditional IPM programming, embrace the use of newer electronic techniques, and seek to expose new audiences to IPM principles. Over the next three years we will focus on engaging our stakeholders in a variety of workshops, demonstrations, and field days where we offer scientifically rigorous, current, and compelling programming. The need to evaluate every project to measure short term and medium term impacts is clear as we collectively progress toward the ultimate goals of increased food production, food security, and adoption of sustainable environmental, economic, and socially responsible pest management practices. Although we have the capacity to work in nearly all the Priority Areas listed in the RFA, with only limited funding available, we have strategically chosen to work in areas that offer us the greatest return on investment. To that end, we will conduct programs in the primary Priority Areas of Specialty Crops, with the goal of IPM implementation on fruit and vegetable crops, 2,4-D herbicide drift, high tunnel production, natural enemy, pollinator, and urban agriculture. Our second primary Priority Area is Agronomic Crops, with the goal of IPM implementation on traditional and emerging pests, transgenic crops, nematodes, improved varieties and seed treatment. In the secondary Priority Areas of Housing, the goal is IPM implementation related to training, identification, and proper management of beg bugs in residential and commercial structures throughout the state. The last secondary Priority Area is the Pest Diagnostic Clinic, which will implement IPM by working with a variety of stakeholders on developing tools to help diagnose specific plant pathogens found in nursery, landscape, and turf.

**Accomplishments**

**Major goals of the project**

- For the next three years, each EIP program priority area will work to achieve all or a subset of these goals:
- A)** For each project, key personnel will conduct trainings in the field or in a classroom setting, during the growing season or during the winter, in conjunction with a currently established conference, program, or create a new training opportunity, in person or online, during the day or evening, as appropriate for the majority of the audience.
  - B)** For each project as appropriate, we will update, develop and distribute specific outreach resources such as newsletters,

enhanced factsheets, instructional IPM videos, trade journal articles, and new curriculum. It is critical this program continues to produce new resource materials to address current issues facing our various clientele.

**C)** We will maintain our Agronomic and Specialty Crop pest monitoring and reporting networks, which combined track over 30 pests annually so that growers can intensify their scouting practices as trap activity increases. We are entering our second year of using MyTraps.com to report pest data to growers in both a graphical and landscape context.

**D)** Design specific workshops for growers and residents to address the management challenges of important invasive pests, including their identification, biology, and management. Ohio has seen tremendous influx of important invasive pests such as the Western Bean Cutworm, Asiatic Garden Beetle, Soybean Aphid, Brown Marmorated Stink Bug, and Spotted Wing Drosophila in the past 5-10 years, plus the massive increase in bed bugs in residential and commercial housing.

**E)** Many of the trainings, such as the Buckeye Lady Beetle Blitz, Pollinator Investigators, Raised Bed Workshops, field crop and specialty crop field days, use demonstrations to help convey the principles of the training to the participants, and make the training more engaging and real to the participants.

**F)** All trainings are open to consultants, growers, scouts, homeowners, etc. to attend, but Extension educators are especially encouraged to attend so that they receive constant renewal of their knowledge and skills that can be transferred to other growers and clients they interact with.

### **What was accomplished under these goals?**

The following were accomplished from October 1, 2014 through June 15, 2015.

**Housing IPM** - Conducted a training session at the Annual ViaQuest Conference, Columbus, OH, in September 2014 for ~75 members of leadership who provide services both to the elderly and to individuals with developmental disabilities and/or mental health issues. A total of 51 evaluation responses were obtained, and the vast majority of the respondents indicated that they were very satisfied with the presentation quality (87%). Many respondents (87%) indicated that the provided information was relevant or very relevant to their work. As a result of the workshop, many respondents (92%) felt moderately to very confident in providing accurate information on bed bug control options (30% indicated that they had this level of confidence before participating in the workshop). Respondents also expressed their intentions to change their behaviors, with 69% indicating that before taking the workshop they never or rarely inspected a hotel room for signs of bed bugs, but after the workshop, 96% expressed that they planned to always do so (the remaining 4% expected to usually conduct an inspection). Two more bed bug workshops were conducted for a total of 13 personnel from Franklin County Children Services but due to space limitations, evaluation results are not reported here.

**Specialty Crop** - A two day high tunnel training for 30 participants was conducted. This high tunnel training included new and emerging pest management topics. The high tunnel training ensured the transfer of new high tunnel IPM and production practices from on-going research programs. Since the management of water in high tunnel production is so important to ensure a profitable and safe crop, a science behind water quality curriculum was taught. Aquaponics production opportunities in high tunnels, disease management, insect management and management of natural enemies were key topics. A post workshop survey revealed the following (n=18, reaching 11,892 ft<sup>2</sup> of tunnel production area): Knowledge of IPM in high tunnels improved from no or very little knowledge (88%) pre-workshop to 88% with moderate knowledge post workshop. 100% of respondents had no or very little knowledge about high tunnel diseases prior to the workshop and improved to 83% having a moderate understanding of diseases post workshop. 89% of respondents were very likely or definitely going to share some of the knowledge they learned at the high tunnel workshop with others. Respondents were very likely or definitely going to apply the information learned today to their own high tunnel operations (88%).

On May 6<sup>th</sup>, a 65 minute webinar on monitoring and managing Spotted Wing Drosophila in small fruit crops had 87 people pre-register (36% growers, 49% Extension or University). Fifty people participated in the webinar, and 35 completed online surveys at the end of the webinar. Nearly 53% of registrants have never seen this pest on their farm. Survey respondents indicated SWD was on their farm last year (2014, 32%) infesting blueberry, raspberry, blackberry, and grape, some of the infestations were severe. Most respondents are not spraying for SWD but some are spraying as many as 7 times per season. Nearly 79% of respondents will use the salt water test to find SWD larvae in fruit and 67% indicated they will use a baited trap to monitor for adult flies. As a result of the webinar 65% of respondents are somewhat confident and 23% confident they can manage SWD in their crops this year. Nineteen respondents indicated we could follow up with them next year about how their season management practices and success. Respondents manage about 20 A of blueberries, 30 A of raspberries, 6 A of blackberries, 10 A of strawberries, 2 A of grapes, and 4 A of peaches, describing themselves mostly as backyard/hobby growers (38%) and conventional growers (35%).

Over the past year the Buckeye Lady Beetle Blitz Program made a major effort to summarize the lady beetle data collected across the state from 2009-2014. By visiting our website ([ladybeetles.osu.edu](http://ladybeetles.osu.edu)) anyone can view all project data summarized by year. They can also click on an interactive map to view what species were collected at each sample location. We held two BLBB workshops in May, 2015 in Wooster and Dayton, OH.

The Pollination Investigators Program was launched in 2014 with the goal of measuring pollination services in home gardens. Their goal was to compare fruit set from pollinator-acceptable and inaccessible flowers using a paired cage study. We received very low levels of volunteer participation in 2015. A Masters in Plant Health Management student is working with Mary Gardiner to develop a survey instrument to determine how to adjust our program goals and instructions to improve volunteer participation. The instrument is completed and currently we are waiting for IRB approval to send it to our volunteers.

Agronomic crops - Three hands-on soybean workshops were held in Greene, Paulding, and Fulton County with 59 participants representing over 173,000 acres (farmed and consulted for). The average value of the workshop was estimated by the participants at \$10/acre which is a \$1.7 million dollar value over the acres represented. Prior to the workshop, participants were asked about their level of knowledge of several topics on a scale from 1-5 (1 = not very knowledgeable, 5 = very knowledgeable). Immediately after the workshop, farmers were asked to rate their prior knowledge and increase in knowledge from the workshop. Topics discussed at the workshop included: yield limiting factors (average increase in knowledge of 0.8), insect management (average increase in knowledge of 1.6), seed treatments (average increase in knowledge of 1.1), and soybean cyst nematode (average yield increase in knowledge of 1.2).

Diagnostic Clinic - An Introductory Workshop on Ornamental Diseases and Insects was organized for OSU Extension educators in May 2015 and was attended by educators from 23 different Ohio Counties. This workshop targeted newly hired and seasoned educators who do not necessarily have a background in ornamentals but deal with the commodity as part of their local responsibilities. The workshop covered basic principles of plant pathology (i.e. pathogen types, symptoms and signs of disease), how to diagnose common diseases of landscape ornamentals, and how to identify common insect pests. A pre-test evaluation was carried out throughout the day to assess the background knowledge on the topics covered during the workshop. None of the attendants identified themselves as having plant pathology or entomology educational background and 57% considered themselves to be just a little knowledgeable when it comes to addressing ornamental problems. Respondents (33%) were not confident in organizing material or presenting a program on ornamental diseases/insects in their county. While the majority of the attendants responded correctly to most of the knowledge questions that were asked, 15 to 20% of them failed to provide the correct answer at each question. A post-test evaluation using Survey Monkey will be conducted at the end of the growing season (August 2015) to assess changes in confidence and knowledge following this workshop.

Diagnostic clinic lab activities - During the time period of this report the C. Wayne Ellett Plant and Pest Diagnostic Clinic processed 615 samples for its clientele. Samples were received from 57 Ohio counties. Clientele served during the time period were diverse and included both commercial and noncommercial interests. The types of samples processed were also diverse. Ornamentals and turf comprised 56% of the samples processed, 30% were from field crops, fruit, vegetables and insect identification requests made up the remaining 14% of samples processed.

#### **What opportunities for training and professional development has the project provided?**

- Allowed two undergraduates to learn and be exposed to basic lab procedures, research protocols, insect rearing techniques, data collection techniques, and scientific writing in the area of entomology. Also allowed these 2 entomology undergraduates to attend professional meetings and conferences to present their data and to meet and network with colleagues thereby enhancing their professional development.
- Beginning May 2015, an OSU graduate student is being funded in the soybean production lab. She is receiving disease/insect identification training (Dorrance and Michel lab). She is also working a meta-analysis of late season fungicide/insecticide trials conducted in Ohio
- We have hired 8 undergraduates to work on the EIP project. While they are under the agronomic PI's supervision, they are based in multiple OSU Extension County offices, mentored by Extension Educators and Co-PI's. This unique internship allows them to partner with Extension staff, interact with agronomic crop producers, given hands-on training in wheat growth stage identification and nematode sampling, and learn scouting and IPM techniques. These undergraduates were also invited to OARDC for a 2 day training event in scouting and IPM.
- Allowed 1 OSU graduate student to design and develop content for the Ornamental Disease Facts website, as well as to deliver training on Rose Rosette Disease to Extension educators during the Introductory Workshop on Ornamental Diseases and Insects (May 2015) in partial fulfillment of the independent study requirement for the Professional Masters in Plant Health degree.
- 27 Extension educators were trained on identification of common ornamental diseases in Ohio.
- The project provided partial support (25%) for a Research Assistant 2 B/H in the C. Wayne Ellett Plant and Pest Diagnostic Clinic. During the project period the research assistant visited the soybean pathology laboratory in Wooster, OH to learn techniques for Oomycete identification using that laboratory's conventional PCR protocol with the goal of incorporating the protocol into the CWEPPDC's repertoire of diagnostic protocols. She also participated in a real-time PCR workshop at Michigan State University.
- Three OSU graduate students and three undergraduate students learned data collection techniques used in field and lab experiments in the area of vegetable and fruit entomology.
- Eleven Extension educators were trained in use of pheromone traps for monitoring the brown marmorated stink bug in vegetable and fruit crops.
- Thirteen Extension educators were trained in use of baited spotted wing drosophila traps for monitoring the adult SWD in small fruit crops (blueberries, raspberries, blackberries, and grapes).
- Eight cooperators were trained in use of pheromone traps for monitoring 8 species of common vegetable pests and 12 species of common fruit pests.
- Helped train one Master Plant Health Management graduate student in specialty crops pest management.
- Helped the PI and one Co-PI attend the national Entomological Society of America national meeting to present a poster.

- Helped the PI attend the 8th International IPM Symposium to present a poster and give an oral presentation.
- Helped Co-PI technician attend the Entomological Society of America annual meeting to present poster.

#### How have the results been disseminated to communities of interest?

-Responded to the bed bug resurgence by providing up-to-date, research-based information on bed bug prevention and management tactics. The public has been educated regarding bed bugs at the local, national, and international level, and numerous interviews have been conducted annually for national and local news affiliates. Dr. Susan C. Jones, OSU Extension State Specialist on Household and Structural Insects, has actively participated in the Central Ohio Bed Bug Task Force (COBBTF), while teaching two workshops for Children Services personnel and presenting at diverse forums throughout Ohio and in some other states and also at OSU Pesticide Recertification conferences, therein reaching an overall audience of >2,300.

-New information has been added to a new bed bug website that is available to all with internet access (<http://u.osu.edu/bedbugs/>). Numerous bed bug photos and PowerPoint presentations are posted on the COBBTF website (<http://centralohiobedbugs.org>).

-There was physical distribution of 57,100 copies of a Household Insect Identification Card (S.C. Jones, D.J. DeGirolamo, J.L. Bryant) and 238 Insect Display Cases to 168 different entities throughout Ohio, with the major recipients being OSU Extension offices (54), city and county health departments (46), aging and disability agencies and medical practices (22), and state government departments and programs (21). Other recipients included pest control companies, schools, universities, etc.

-Two educational training events had an evaluation element to determine if the target audiences gained knowledge of bed bug identification, bed bug prevention, integrated pest management (IPM) tactics to combat bed bugs, etc. Self-reported measures indicate that knowledge was gained and that behaviors will be changed as a result of the training to increase public knowledge of bed bugs and their prevention and management.

-USDA Farm Service Agency employees including Chris Piper, head Program Specialist for the Ohio USDA Farm Service Agency High Tunnel Environmental Quality Incentives Program, participated in the high tunnel training and took the information back to teach her county based FSA Directors. Agriculture & Natural Resources Educators, Specialists and Program Assistant also participated in the training.

-Current information posted at the new website <https://u.osu.edu/pestmanagement/> and <http://ipm.osu.edu>.

-The results of our Buckeye Lady Beetle Blitz program are available on the website ([ladybeetles.osu.edu](http://ladybeetles.osu.edu)).

-Results were distributed at three hands-on soybean workshops during January/February 2015. Materials distributed to 59 participants included: Ohio Agronomy Guide, How a Corn Plant Develops, Soybean Growth and Development, and Corn, Soybean, Wheat, and Alfalfa Field Guide.

Other information (in addition to the material explained above which included fact sheets and other bulletins) from work related to the proposal was presented and distributed throughout various extension events hosted by county extension offices.

-The C. Wayne Ellett Plant and Pest Diagnostic Clinic shared information on the diseases and insects detected in its routine diagnostic program primarily through various electronic newsletters and electronic communications, including but not limited to:

- Buckeye Yard and Garden Line: <http://bygl.osu.edu>
- Floriculture Industry Roundtable of the Midwest monthly teleconference among research and Extension personnel in multiple states
- Floriculture Industry Roundtable of the Midwest blog: <http://firm.cfaes.ohio-state.edu>
- VegNet Newsletter: <http://vegnet.osu.edu/newsletter> in collaboration with vegetable disease specialist
- C.O.R.N. Newsletter: <http://corn.osu.edu> in collaboration with crop disease specialists

-Results were also shared individually with clientele via direct communication (email, phone or surface mail).

-New factsheets were posted to the new website on ornamental plant diseases available to all with Internet access (<https://u.osu.edu/ornamentaldiseasefacts/>).

-There was physical distribution of 27 copies of the resource books "Diseases of Trees and Shrubs" and "Woody Ornamental Insect, Mite, and Disease Management" to county extension educators that attended the Introductory Workshop on Ornamental Diseases and Insects.

-Weekly articles in the VegNet newsletter.

-The OSU IPM website (IPM.OSU.EDU).

#### What do you plan to do during the next reporting period to accomplish the goals?

In general, execute the objectives and activities outlined in the second year of the proposal. Some specifics are listed below.

- Several bed bug workshops and trainings will be conducted throughout Ohio and other states. An evaluation element will be used to determine if the target audiences gained knowledge of bed bug identification, bed bug prevention, integrated pest management (IPM) tactics to combat bed bugs, etc.

-A bed bug information website will be further updated with additional content and monitoring will be provide on usage (hits) on the website and on specific web items pertaining to bed bugs.

- A follow-up survey of the pest management industry will be conducted via OSU's Statistical Consulting Service (SCS), a for-fee support service that will provide survey design, administration, and analysis.
- Continue to train a graduate student in the soybean production lab on disease/insect identification and methods to rate disease leaf area affected and insect defoliation. Graduate student will publish a meta-analysis of late-season fungicide/insecticide trials conducted in Ohio by May 2017. Newsletter articles/Extension presentations will be developed based on the results of the meta-analysis.
- Sampling and scouting for kudzu bug and Asiatic garden beetle will continue until the end of June. In July, we will begin root digs in continuous corn acreage to determine efficacy of Bt transgenic crops and monitor for the presence of Bt resistance. We will also begin sweep net collecting and inspection of soybean fields for the presence of stink bugs--this work will continue until September.
- Weather data collection and quantification of associations among weather, late-season wheat diseases and grain quality will continue until mid-July, while monitoring and quantification of foliar and ear diseases of corn and their association with in-season weather will continue until the end of October. These data will be used to generate extension materials to educate interns funded on the project as well as stakeholders during the fall-winter extension meeting season on matters related to factors affecting grain yield and quality losses.
- Conduct a post-test evaluation using Survey Monkey at the end of the 2015 growing season (August) to assess changes in confidence and knowledge in workshop attendants
- Organize a new workshop in Spring 2016 for new OSU extension educators (hired in 2015) to deliver training on ornamental diseases and pests. A pre- and post-test evaluation will also be carried out.
- Provide additional training to the 2015 workshop attendants through focused webinars during the winter/spring 2015-2016
- Continue to develop and upload new content on the ornamental disease facts website to cover common diseases of nursery ornamentals by June 2016 (currently only greenhouse diseases are covered).
- A key activity will be planning a virtual field day for vegetable crops.

### Participants

#### Actual FTE's for this Reporting Period

Role	Non-Students or faculty	Students with Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	2.1	1.2	0.8	0	4.1
Professional	0	0	0	0	0
Technical	1	0	0	0	1
Administrative	0.5	0	0	0	0.5
Other	0	0	0	0	0
Computed Total	3.6	1.2	0.8	0	5.6

#### Student Count by Classification of Instructional Programs (CIP) Code

Undergraduate	Graduate	Post-Doctorate	CIP Code
12	1	0	01.00 Agriculture, General.

### Target Audience

The following groups of people have been reached by the outreach efforts of the OSU EIP Program personnel during October 1, 2014 - June 15, 2015; commercial fruit growers, commercial small fruit growers, commercial vegetable growers, home gardeners, Master Gardeners, students, diagnosticians, teachers, extension educators & other professionals, Ohio NRCS state and local staff, crop consultants, certified crop advisors, seed company representatives, agri-chemical company representatives, commodity board representatives, and field crop producers. Other targeted audiences include small scale Appalachian farmers, rural and urban farmers, African American and Hispanic farmers, Amish & Mennonite farmers who are educationally disadvantaged (8th grade education at best).

### Products

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Jones, S. C. 2014. Bed Bugs: The Reality; The Cause and Cure. Annual ViaQuest Conference, Columbus, OH, 25 September 2014.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Jones, S. C. 2014. Bed bugs and beyond--challenges of bed bug infestations in Ohio residential settings. Ohio Housing Conference, Columbus, OH, 4 November 2014.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Tyrpak, A. M., S. C. Jones, and J. L. Bryant. 2014. How to kill bed bugs in portable items: unconventional non-chemical approaches. Annual Meeting of the Entomological Society of America, Portland, OR, 16-19 November 2014.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Ferguson, O. J., S. C. Jones, and J. L. Bryant. 2014. Effectiveness of alcohol as a do-it-yourself treatment to combat the bed bug, Cimex lectularius. Annual Meeting of the Entomological Society of America, Portland, OR, 16-19 November 2014.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	YES

**Citation**

Ferguson, O. J. [presenter], S. C. Jones, and J. L. Bryant. Effectiveness of alcohol as a do-it-yourself treatment to combat the bed bug, Cimex lectularius. Minorities in Agriculture, Natural Resources, and Related Sciences Conference. Houston, TX, 26-29 March 2015.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	YES

**Citation**

Doohan, D. 2015. Consequences of 2,4-D and dicamba tolerant field crops. Virginia Vineyard Association. Charlottesville, VA. February 6, 2015. 175 in attendance.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2015	YES

**Citation**

Doohan, D. 2015. Managing risk of 2,4-D and dicamba tolerant soybean. Mid-Atlantic Fruit and Vegetable Convention. Hershey, PA. January 27, 2015.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Hand, F.P. "Elm Yellows: The Re-emergence of An Old Disease." Presented at 19th Workshop on Ornamental Diseases and Insects. Hendersonville, NC Sept 29-Oct 3, 2014.

Type	Status	Year Published	NIFA Support Acknowledged
Websites	Under Review	2015	YES

**Citation**

A new website <http://u.osu.edu/ornamentaldiseasefacts/> hosted by The Ohio State University provides green industry stakeholders with science-based information to identify and manage diseases of ornamental plants. Content developed this first year includes information on common diseases of greenhouse crops. The information provided includes guidelines on symptoms recognition, images of both symptoms (disease) and signs (pathogen), environmental conditions conducive to disease development, and management recommendations.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Dorrance, A.E., Martin, C., Clevenger, B., and Davis, M. 2014. Management of Soybean Seedling Pathogens. American Seed Trade Association. Dec. 11, Chicago, IL. 100 attendees

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Jasinski, James and Celeste Welty. 2014. The spotted wing Drosophila (*Drosophila suzukii*) monitoring network in Ohio. Poster D3375. Entomological Society of America, Annual Meeting, Portland, OR, 18 November 2014.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2014	YES

**Citation**

Welty, Celeste. 2014. Status of brown marmorated stink bug in the Midwest. Brown marmorated stink bug working group meeting, Winchester VA, 12/3/2014.

**Other Products****Product Type**

Educational Aids or Curricula

**Description**

Distributed 57,100 copies of a Household Insect Identification Card (S.C. Jones, D.J. DeGirolamo, J.L. Bryant)- the front side of the ID card depicts photos of bed bug nymphs and adults, and other common household arthropod pests; the back of the card lists tips for bed bug prevention and control.

**Product Type**

Educational Aids or Curricula

**Description**

Distributed 238 Insect Display Cases, including 141 small and 97 large ones. Small display cases contain a variety of bed bug nymphal stages and male and female adults to aid in proper identification. Large cases display a variety of bed bug nymphal stages and male and female adults as well as 9 common household arthropod pests that are commonly confused with bed bugs.

**Product Type**

Other

**Description**

Added information to website: <http://u.osu.edu/bedbugs/> hosted by The Ohio State University. Website provides internal links to photo galleries, research articles, internet resources pertaining to bed bugs, and detailed answers to frequently asked questions (FAQ).

**Product Type**

Other

**Description**

Jones, S. C. 2014-2015. What everyone needs to know about bed bugs." Franklin County Children Services Workshop, Columbus, OH. Conducted two 3-hr workshops for a total of 13 participants , 15 October 2014 (5 attendees) and 27 March 2015 (8 attendees).

**Product Type**

Other

**Description**

Jones, S. C. 2014. Bed bug biology/behavior and research updates. Seventh Annual Central Ohio Bed Bug Task Force Summit, Columbus, OH, 17 October 2014. Presented a 45-min talk followed by a Q&A session for an audience of ~150 comprised of social workers, school nurses, firefighters, landlords, tenants, etc.

**Product Type**

Other

**Description**

Christman, A., S. Alcala, and S. C. Jones. "Tips for do-it-yourself bed bug treatment." Each presenter focused on a particular group of products in a 45 min presentation followed by a Q&A session for an audience of ~150 comprised of social workers, school nurses, firefighters, landlords, tenants, etc..

**Product Type**

Other

**Description**

Tyrpak, A. M. [presenter], S. C. Jones, and J. L. Bryant. "How to kill bed bugs in portable items: unconventional non-chemical approaches" (poster). CFAES Undergraduate Research Forum, The Ohio State University. 19 February 2015.

**Product Type**

Other

**Description**

Jones, S. C. 2014. Management strategies to win the battle against bed bugs. Ohio Pest Management Association Winter Meeting, Columbus, OH, 9 December 2014.

**Product Type**

Other

**Description**

Jones, S. C. 2015. Management strategies to win the battle against bed bugs Parts 1 and 2." Ohio Commercial Pesticide Applicator 2015 Recertification Conferences in Sandusky, OH--22 January 2015; Dayton, OH-- 29 January 2015; Akron, OH--18 February 2015; Columbus, OH—11 March 2015. One hour presentation (including Q&A period) at each of the four locations to an overall audience of ~1,400.

**Product Type**

Educational Aids or Curricula

**Description**

Fact Sheet - "Reducing Herbicide Drift Risk to Specialty Crops

**Product Type**

Other

**Description**

The EIPM High Tunnel Training was conducted at the Ohio State University Piketon Research & Extension Center on April 27 and 28 2015 with a total attendance of 30 which consisted of growers, USDA Program



Specialists and OSU Extension Educators, Program Assistants and Specialists.

**Product Type**

Other

**Description**

Vegetable grafting demonstration at High Tunnel training workshop.

**Product Type**

Evaluation Instruments

**Description**

High Tunnel grower workshop evaluation

**Product Type**

Other

**Description**

Michel AP. Update on Kudzu Bugs in Ohio. CORN Newsletter, OSUE Agronomic Crops Team. 2014-20.

**Product Type**

Other

**Description**

Michel AP. Expectations for Western Bean Cutworm in Ohio. CORN Newsletter, OSUE Agronomic Crops Team. 2014-20.

**Product Type**

Other

**Description**

Michel AP. Insects in Soybean. CORN Newsletter, OSUE Agronomic Crops Team. 2014-22.

**Product Type**

Other

**Description**

Michel AP. Western Bean Cutworm Flight is Increasing. CORN Newsletter, OSUE Agronomic Crops Team. 2014-22.

**Product Type**

Other

**Description**

Distribution maps western bean cutworm and kudzu bug - maps posted to the Agronomic Crops Insect website, <http://oardc.osu.edu/ag/> and posted in CORN newsletter.

**Product Type**

Other

**Description**

Field crop pest monitoring network:  
Western bean cutworm: 55 sites in 15 counties  
Kudzu Bug: 15 sites in 4 counties  
Asiatic Garden Beetle: Monitoring in 3-4 counties  
Western corn rootworm resistance monitoring: 3 sites in 3 counties

**Product Type**

Other

**Description**

Hand, F.P, Taylor, N.J., Shetlar, D. (May 2015) Introductory Workshop on Ornamental Diseases and Insects organized for OSU Extension Educators

**Product Type**

Evaluation Instruments

**Description**

Hand, F.P and Taylor, N.J. (May 2015) Introductory Workshop on Ornamental Diseases and Insects evaluation using TurningPoint technology.

**Product Type**

Other

**Description**

Hand, F.P. and Taylor, N.J. (March 2015). "Biology, Epidemiology and Control of Fungal Pathogens Associated with fruit Rot of Winterberry Hollies in Ohio Nurseries."

**Product Type**

Other

**Description**

Lin, S., Taylor, N.J., Zondag, R.H., Hand, F.P. "Spore Trapping Studies in Ohio's Winterberry Orchards." Presented at 19th Workshop on Ornamental Diseases and Insects. Hendersonville, NC, Sept 29-Oct 3, 2014.

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Black root rot"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Powdery mildew"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Verticillium wilt"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Rhizoctonia crown rot"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Sclerotinia stem rot"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Pythium root rot"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Phytophthora root rot"

**Product Type**

Educational Aids or Curricula

**Description**

The following interactive fact-sheets have been published at <http://u.osu.edu/ornamentaldiseasefacts/>

- Roche, E.H, and Hand, F.P. "Downy mildews"

**Product Type**

Audio or Video

**Description**

Pierce Paul video on staging wheat using Feekes scale.

<http://agcrops.osu.edu/photo-library/multimedia/staging-wheat-feekes-gs-6>

**Product Type**

Other

**Description**

Dorrance, A.E. and Huzar Novakowski, J. 2014. Management of White Mold in Soybeans in Ohio: Current studies and strategies. Presented at Soybean Disease and Insect Field Night. August 11, 2014 30 attendees

**Product Type**

Other

**Description**

Dorrance, A.E. 2014. Soybean Disease Update. Southwest Ohio Corn Growers and Fayette County Agronomy Day. August 12, 2014. 75 attendees

**Product Type**

Other

**Description**

Dorrance, A.E. 2014. Soybean Diseases in Ohio. Farm Science Review CCA College. Sept 9, 2014. 30 participants.

**Product Type**

Other

**Description**

Dorrance, A.E. 2014. Challenges, Changes, and issues for soybean production in Ohio. Northeast Ohio Crop Consultants. Smithville, Ohio. Sept 22. 25 attendees

**Product Type**

Other

**Description**

Dorrance, A.E. 2014. Pesticide Applicator Update for County Educators. Columbus, Ohio Dec 16. 40 attendees.

**Product Type**

Other

**Description**

Dorrance, A. White mold or Sclerotinia stem rot is here. C.O.R.N. 2014-27

**Product Type**

Other

**Description**

Dorrance, A. Fields are starting to turn a golden yellow – last chance to grab some data. C.O.R.N. 2014-30.

**Product Type**

Other

**Description**

Dorrance, A. The best data of the year is coming in now. C.O.R.N. 2014-32.

**Product Type**

Other

**Description**

Dorrance, A.E. Accelaron ® Challenge – I lost. C.O.R.N. 2014-38.

**Product Type**

Other

**Description**

Dorrance, A., Martin, C., Balk, C., and Wickramasinghe, D. Cold Spring rains brought perfect conditions for Pythium in Ohio and a few more surprises. C.O.R.N. 2014-39.

**Product Type**

Other

**Description**

A revised website, <http://u.osu.edu/pestmanagement/>, 'Vegetable & Fruit Insect Pest Management', was created, hosted by The Ohio State University, which includes links to trap reports, pest management

information, research reports, slideshows, and links to key resources.

**Product Type**

Evaluation Instruments

**Description**

Online evaluation survey for spotted wing drosophila monitoring and management webinar participants on May 6th, 2015

**Product Type**

Educational Aids or Curricula

**Description**

Jasinski, J. 2015. Salt Water Test for Spotted Wing Drosophila (SWD) Larvae. Factsheet. Online at <https://u.osu.edu/pestmanagement/info/swd/>

**Product Type**

Other

**Description**

Update and maintain OSU IPM webpage. <http://ipm.osu.edu>

**Product Type**

Other

**Description**

Welty, C. 2015. Using microscopes to diagnose pest problems (workshop). Mid-Ohio Growers' Meeting. Dalton, OH. 1/8/15. 6 hours.

**Product Type**

Other

**Description**

Welty, C. 2015. Spotted wing drosophila on berry crops. Ohio Ecological Food and Farm Association, Annual Conference. Granville, OH. 2/17/15. 55 minutes.

**Product Type**

Other

**Description**

Welty, C. 2015. Grape insect management update. Ohio Grape and Wine Conference. Dublin, OH. 2/17/15. 30 minutes.

**Product Type**

Other

**Description**

Welty, C. 2015. Stink bugs. The 39th Annual Tomato Day. Dover Centre, Ontario. 3/3/15. 30 minutes.

**Product Type**

Other

**Description**

Welty, C., J. Jasinski. 2015. Monitoring and management tactics for spotted wing drosophila in berry crops. Ohio IPM Webinar. Columbus, OH. 5/6/15. 65 minutes. 60 participants.

**Product Type**

Other

**Description**

Jasinski, J. and Welty, C. 2015. How to identify the spotted wing drosophila. Ohio IPM Workshop. Wooster, OH. 5/20/2015. 90 minutes. 6 participants

**Product Type**

Other

**Description**

Welty, C.; D. Miller; D. Doohan, D. 2015. Midwest Tree Fruit Spray Guide. Ohio State Univ. Extension Bull. 506A2. 72 pp. Published at Purdue Univ. (revised annually; Welty an author since 1990)

**Product Type**

Other

**Description**

Dami, I.; G. Gao; B. Bergesford, D. Doohan; C. Welty. 2015. Midwest Commercial Small Fruit and Grape Spray Guide. Ohio State Univ. Extension Bull. 506B2. 89 pp. Published at Purdue Univ. (revised annually; Welty an author since 1990)

**Product Type**

Other

**Description**

Egel, D.; R. Foster; E. Maynard; R. Weinzierl; M. Babadoost; P. O'Malley; A. Nair; R. Cloyd; C. Rivard; M. Kennelly; B. Hutchison; J. Piñero; C. Welty; D. Doohan; S. Miller. 2015. Midwest Vegetable Production Guide for Commercial Growers 2015. OSU Extension Bull. 948. 210 pp. Published at Purdue Univ. (revised annually; Welty an author since 2013).

**Product Type**

Other

**Description**

Buckeye Lady Beetle Blitz Volunteer Round-Up, Wooster, OH (5/14/15) Full day workshop focused on training for the citizen science research project Buckeye Lady Beetle Blitz. (10 participants)

**Product Type**

Other

**Description**

Buckeye Lady Beetle Blitz Volunteer Round-Up, Dayton, OH (5/27/15) Full day workshop focused on training for the citizen science research project Buckeye Lady Beetle Blitz. (15 participants)

**Changes/Problems**

{Nothing to report}