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Program Name: Extension Integrated Pest Management -

Project Director

James Jasinski
937-484-1526
jasinski.4@osu.edu

Recipient Organization

EXT - OHIO STATE UNIVERSITY EXTENSION
1960 KENNY RD
COLUMBUS, OHIO 43210-1016
DUNS No. 832127323

Performing Department

Extension County Operations

Co-Project Directors

Kovach, Joseph

Departments

OSUE-Entomology

Non-Technical Summary

The Ohio Integrated Pest Management Program is a comprehensive program that is organized to encourage collaboration and innovation among Ohio Agricultural Research and Development Center (OARDC) scientists and Ohio State University Extension (OSUE) personnel to better address the pest management needs of the citizens of Ohio. The goal of the OH IPM program is to reduce the environmental, economic and social risk associated with managing pests (arthropod, disease, weed, or vertebrate). To accomplish this goal we use the existing OSUE structure and direct our efforts to OSU collaborators to help them evaluate and disseminate new IPM information. For the next three years the general goals for the 6 IPM emphasis areas are: 1) identify the disease, insect and weed issues which are negatively impacting yields of agronomic crops in southern OH; 2) to develop a Train-the-Trainer IPM program to train Master Gardener Volunteers to deliver an IPM module to consumers in Ohio; 3) to work with vegetable growers to more fully adopt IPM practices through workshops and field days and to establish an urban agricultural IPM demonstration site on an abandoned parking lot; 4) continue to partner with Natural Resource Conservation Service (NRCS) to provide incentives for fruit, vegetable, and field crop growers to adopt IPM; 5) provide a remote sensing diagnostic station to increase the capacity of the Ohio plant diagnostic network; and 6) create a TV public service announcement to educate the public on bedbug IPM.

Accomplishments

Major goals of the project

The goal of the Ohio Integrated Pest Management program is to reduce the environmental, economic and social risk associated with managing pests (arthropod, disease, weed, or vertebrate). To accomplish this goal we use the existing OSUE structure and direct our efforts to OSU collaborators to help them evaluate and disseminate new IPM information in 6 IPM area of emphases. These emphasis areas are Agronomic Crops, Consumer/Urban Environments, Specialty Crops, Conservation Partnerships, Support for Pest Diagnostic Facilities, and IPM Training and Implementation in Housing. Specific specific for each area are: 1) identify the disease, insect and weed issues which are negatively impacting yields of agronomic crops in southern OH; 2) to develop a Train-the-Trainer IPM program to train Master Gardener Volunteers to deliver the IPM module to consumers in Ohio; 3) to work with vegetable growers to more fully adopt IPM practices through workshops and field days and establish an urban agricultural IPM demonstration site on an abandoned parking lot; 4) continue to partner with Natural Resource Conservation Service (NRCS) to provide incentives for fruit and vegetable, and field crop growers to adopt IPM and update field crop IPM elements; 5) provide a remote sensing diagnostic station to increase the capacity of the Ohio plant diagnostic network; and 6) create a TV public service announcement to educate the public on bedbug IPM.

What was accomplished under these goals?

The OSU Extension IPM Program is a broad based program dedicated to reducing environmental impacts of pesticides, improving social understanding of IPM, and enhancing economic outcomes for both residential and grower communities in urban and rural settings. We do this by partnering with OSU department specialists, Extension educators, and other stakeholders who conduct workshops, conferences, write journal articles, fact sheets, and newsletter articles, maintain and update websites, develop curricula, and host other training sessions consistent with our mission.

As a result of this program, specialty and field crop growers have access to unbiased research information at meetings and field days that help guide their management and production practices. They also have a viable plant and pest diagnostic clinic to send unknown pest samples and have the ability to apply to conservation programs such as EQIP for cost sharing opportunities related to pest management. By strengthening our contact with residents through our county based Master Gardener programs, citizens are exposed to better cultural, biological, and pesticide control options for their garden and landscape. Lastly, afflicted residents are finding some relief from expanding cosmopolitan pests such as bed bugs through our educational efforts, workshops, videos, and public service announcements targeting major metropolitan areas in need.

1. Field Crops - During 2013, four on-farm research studies were done to assess if planting reduced plant populations would reduce the impact of charcoal rot. Charcoal rot is a fairly "new" disease to Ohio producers. Our efforts are to assess if these or similar tactics should be incorporated into our crop production practices. Soybean workshops were also held in two counties this past year. In addition, more in depth schools were held for certified crop advisors to bring them the latest research findings from entomology and plant path agronomic crop researchers.

Two hands-on soybean workshops were held during winter 2013 in Ashtabula County and Shelby County. The workshops featured activities including insect and disease identification as well as soybean yield estimates. There were 45 farmers in attendance at the Ashtabula County workshop representing over 32,000 acres of farmland. At the Shelby County workshop, there were 20 farmers in attendance representing over 14,000 acres of farmland. Participants were surveyed about their knowledge of soybean yield components, scouting and management of stinkbug, and identification of soybean disease. Knowledge of soybean yield components, scouting and management of stinkbug, and identification of soybean disease increased by 30%, 73%, and 37%, respectively, at both workshop locations. Overall, many farmers commented that the workshops were highly informative and enjoyed the hands-on activities.

2. Urban IPM – The goal to implement the "train the trainer" model to teach IPM to new Master Gardener recruits was changed due to challenges with teaching volunteers to learn the turning point technology. We switched to fortifying resource libraries in active county programs in order to increase the MGVs' confidence in being able to diagnose plant problems. To augment the textbooks and manuals, there were also four diagnostic workshops attended by 145 citizens and master gardeners to increase their ability and confidence in diagnosing plant and pest samples.

3. Specialty Crops – Conducted workshops and field days on spotted wing drosophila management, pumpkin production, high tunnel pest management, and disease diagnostics. Conducted multiple sweet corn insecticide trials including transgenic hybrids, conducted multiple disease spray trials in pumpkin for growers. Maintained monitoring and reporting network for 21 key fruit and vegetable pests.

Served over 125 growers at these meetings, some select program impacts include: 80% of growers who participated in the high tunnel workshop reported that they are better prepared to select legal pesticides for use in high tunnels; 96% reported that the knowledge they gained will make them more competitive in the market place; 100% reported that they learned at least one new practice by attending the high tunnel workshop; and 100% of participants reported that they will likely apply the pest management information they learned in their high tunnel operations.

4. Conservation Partnerships - Ohio NRCS EQIP programs rely on field crop and specialty crop IPM Elements written by OSU faculty to qualify applicants for IPM related contracts. In 2012, 96 high tunnel and two IPM (595) contracts (Fruit & Vegetable scenario and Small Farm scenario) were awarded to Ohio growers. Approximate cost share from NRCS on these EQIP contracts is \$425,000.

5. Plant and Pest Diagnostic Clinic – The clinic strives to provide accurate and timely plant disease and insect diagnostic information, thus enabling clientele to utilize effective and appropriate plant disease and/or insect management decisions. Diagnostic services are utilized by commercial growers in the areas of field crops, specialty crops, landscape and ornamentals, and residential consumers.

The clinic received 900 plant or insect specimens identified or diagnosed utilizing modern or traditional diagnostic procedures and interacted with 1,020 individuals who received diagnostic information via factsheet or phone call. The specimens received and examined represented 71 of Ohio's 88 counties, plus 6 adjacent states. Sixty-eight percent of the specimens examined represented commercial interests. The C. Wayne Ellett Plant and Pest Diagnostic Clinic partnered with 7 other diagnostic labs to develop a sample submission app for iPhone and iPad which is now available on iTunes.

6. Community IPM - Produced and dissemination of a total of five important educational messages via 30-60 second videos regarding bed bugs. The bed bug public service announcements conveyed the messages that (1) Anybody can get bed bugs; (2) Helpful tips for reducing the numbers of bed bugs; (3) Bug bombs (over-the-counter foggers) won't eliminate a bed bug infestation; (4) Tips for travelers to avoid taking bed bugs home; and (5) Tips for selecting a pest management company for bed bug extermination.

This bed bug management series has been posted to the OSU IPM YouTube channel and has been disseminated in meetings around the state. These videos have been aired as a series of five Public Service Announcements on the major

television networks (ABC, NBC, CBS) in Dayton, Cincinnati, Columbus, Cleveland, Toledo, and Portsmouth, where they have the potential to reach the majority of the state's population.

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

The grant has allowed several members of the agronomic, specialty crop, and community IPM emphasis areas the opportunity to present their applied research at regional or national meetings, such as the Entomological Society of America or American Phytopathological Society.

How have the results been disseminated to communities of interest?

The results of the effort put forth by all members of the IPM program have been disseminated in a variety of ways including phone calls to consumers or growers, conference calls, fact sheets, OSU Extension newsletter articles, popular press articles, journal articles, workshops, field days, conferences, radio interviews, television public service announcements, the OSU IPM website, Department websites, and webinars.

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

Our goals for FY2012 have been attained. All emphasis areas of the IPM program will continue to work to deliver the goals and accomplishments outlined in our original proposal.

Participants

Actual FTEs for this Reporting Period

Role	Faculty and Non-Students	Students within Staffing Roles			Computed Total by Role
		Undergraduate	Graduate	Post-Doctorate	
Scientist	1.2	3	0	0	4.2
Professional	0	0	0	0	0
Technical	0.5	0	0	0	0.5
Administrative	0	0	0	0	0
Other	0	0	0	0	0
Computed Total	1.7	3	0	0	4.7

Target Audience

The following groups of people have been reached by the multifaceted efforts of the OSU EIPM Program during September 1, 2012 – August 31, 2013; 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, socially and economically disadvantaged refugee immigrant farmers from Sudan, Somalia, Azerbaijan, Uzbekistan, and Turkey, and Amish & Mennonite farmers that are educationally disadvantaged (8th grade education at best) were also served by this project.

Products

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Awaiting Publication	2013	NO

Citation

Testen, A., Mamiro, D. P., Meulia, T., Subedi, N., Islam, M., Baysal-Gurel, F. and Miller, S. A. 2013. First report of Leek yellow stripe virus in garlic in Ohio. Plant Disease 97: (in press).

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Published	2013	NO

Citation

Xu, X., Baysal-Gurel, F. and Miller, S. A. 2013. First report of tomato pith necrosis caused by *Pseudomonas mediterranea* in the US and *P. corrugata* in Ohio. *Plant Dis.* 97:988.

Type	Status	Year Published	NIFA Support Acknowledged
Journal Articles	Published	2013	NO

Citation

Xu, X. and Miller, S. A. 2013. First report of bacterial leaf spot of parsley caused by *Pseudomonas syringae* pv. *coriandricola* in Ohio. *Plant Dis.* 97:988.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2012	NO

Citation

Jasinski, J., M. Gardiner, C. Welty, D. Fischer, C. Smith, C. Burkman, B. Phillips, S. Prajzner, S. Rose, D. Saunders, B. Robison, R. Gora, C. Rudramuni, and A. Varadarajan. 2012. Developing A Multifaceted Natural Enemies Smartphone Application. Entomological Society of America. Knoxville, TN.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	NO

Citation

Bergefurd, B. 2013. Ohio Strawberry Plasticulture Row Cover Management. Colloquia and Workshops of the American Society for Horticultural Science Conference. 2013 ed. Vol. 1, Palm Desert: American Society for Horticultural Science.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	NO

Citation

Bergefurd, B., B. Poling, and S. Wright. 2013. The Evolution of Ohio Strawberry Plasticulture Production (2001-2013). Proceeding of the American Society for Horticultural Science Conference 2013. 2013 ed. Vol. 1, Palm Desert: American Society for Horticultural Science.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	NO

Citation

Bauman, J., B. Bergefurd, G. Cochran. 2013. Specialty Crop Growers Apprenticeship Program. Presented at 2013 National Conference for American Association for Agricultural Education. Columbus, Ohio.

Type	Status	Year Published	NIFA Support Acknowledged
Conference Papers and	Published	2013	NO

Citation

Bergefurd, B., T. Harker, S. Wright. 2013. Plasticulture Strawberry Production for Season Extension in the Midwest. Presented at Galaxy IV - Bridging the Centuries: A New Era for Extension. Pittsburgh, Pennsylvania.

Other Products

Product Type

Educational Aids or Curricula

Description

Title: Specialty Crop Growers Apprenticeship Program

Overall Objective: This curriculum was developed to educate and train new specialty crop growers on the essential production skills required to produce local foods and to meet the needs for skilled growers and workers in the local foods industry.

Target Audience: New and beginning farmers (primary) and University & Extension professionals (secondary).

Curriculum: Curriculum consists of pre and post-tests, nine lesson plans, nine presentations complete with speaker notes, workbooks, worksheets and fact sheets. This educational curriculum was the basis of the 20 week training program which covered; Planning Seasonal Crop Production, Maintenance of Equipment & Facilities, etc.

Impact: The program was delivered in 2012 with eight specialty crop grower student apprentices being accepted into the program and completing the 144 hours of classroom instruction and 2,000 On-the-Job Training (OJT) hours. At the conclusion of the program participants received certificates of completion as Journeypersons from the Ohio Apprenticeship Council and the Bureau of Apprenticeship and Training, U.S. Department of Labor. Evaluation results indicated that participants improved their knowledge of farm management, improved their ability to implement seasonal specialty crop production and maintenance techniques and increased their confidence in designing product marketing strategies.

Product Type

Educational Aids or Curricula

Description

Title: Plasticulture Strawberry Production

Overall Objective: To educate farmers of the components of the plasticulture strawberry production system and how this system can be modified to be an economically feasible crop option on their farm.

Target Audience: Farmers& Landowners (primary), and Extension professionals (secondary).

Curriculum: Consists of overheads, worksheets, production budgets, published articles and web based materials designed to provide an overview of the production components of the plasticulture strawberry system. Curriculum can be modified according to the experience level of the audience.

Impact: Prior to development of this curriculum Ohio had no acres of plasticulture strawberries being grown with 100 acres currently in production. Program evaluations indicated that participants would increase their acreage of plasticulture strawberries, that they had improved their knowledge of plasticulture production techniques and were better prepared to make production decisions.

Product Type

Educational Aids or Curricula

Description

Innovative Tomato Disease Fact Sheets on bacterial spot, bacterial speck, bacterial canker and pith necrosis provide information on host range, disease symptoms, environmental conditions that favor disease, and scouting and management recommendations. Each factsheet includes three levels of knowledge targeting home gardeners (basic), commercial growers (advanced) and diagnosticians. The factsheets contain high-resolution images, definitions of uncommon terms in both English and Spanish, and links to additional resources. The factsheets are published at www.vegetablediseasefacts.com and a downloadable summary of each disease factsheet is available in English and Spanish.

Product Type

Other

Description

Activities from Specialty Crops and Agronomic Crops:

A trapping network was established for collection and dissemination of monitoring data on spotted wing drosophila using the MyTraps commercial website.

Kits of supplies needed to monitor adult spotted wing drosophila by baited traps and detection of larvae in fruit by salt water floatation were assembled and distributed to project cooperators at SWD workshop.

Surveyed and sampled for the presence of soybean rust from southern Ohio. NO soybean rust has been found to date.

Product Type

Other

Description

Events from Specialty Crops and Urban IPM:

A training workshop on spotted wing drosophila identification and management was held on 4/25/2013. This 3-hour program was attended by 18 growers, crop consultants, and extension educators, and included hands-on insect identification exercises with microscopes.

A webinar on spotted wing drosophila management in home gardens was held on 8/29/2013 for members of the Ohio Master Gardener Volunteer Program.

Short presentations (10-30 minutes) on spotted wing drosophila management were given at six winter schools for commercial growers and at two summer field tours for commercial growers.

Four Master Gardener plant and pest diagnostic workshops were attended by 145 people who indicated increased confidence in their ability as a result of the workshop.

Product Type

Software or NetWare

Description

C. Wayne Ellett Plant and Pest Diagnostic Clinic partnered with 7 other diagnostic labs to develop and pilot a sample submission app for iPhone and iPad.

Product Type

Educational Aids or Curricula

Description

Specialty crops:

A 2-page color handout on spotted wing drosophila identification, monitoring, and management was written in spring 2012 and updated in winter 2013. It was posted on OSU's fruit and vegetable pest management website and distributed as hard copies at 6 winter schools and 6 summer field day programs.

A handout on procedures for trapping spotted wing drosophila was written, and given to cooperators and posted on OSU's fruit and vegetable pest management website.

A handout on procedures for floatation sampling for spotted wing drosophila larvae was written, and given to cooperators and posted on OSU's fruit and vegetable pest management website.

A slideshow about spotted wing drosophila was posted on OSU's fruit and vegetable pest management website.

A handout on spotted wing drosophila management in home gardens was written in summer 2013, and posted

on OSU's fruit and vegetable pest management website.

Product Type

Other

Description

27 field crop and specialty crop articles in newspapers, popular press articles, and commodity related publications.

Product Type

Other

Description

59 articles written for the CORN and VegNet newsletters.

Product Type

Audio or Video

Description

Bed Bug PSA #1 - Anyone Can Get Bed Bugs, <http://go.osu.edu/bbug1>

Bed Bug PSA #2 - How to Get Rid of Bed Bugs, <http://go.osu.edu/bbug2>

Bed Bug PSA #3 - Bug Bombs, <http://go.osu.edu/bbug3>

Product Type

Other

Description

Services:

Phone calls and email messages from 31 growers or cooperators were answered about spotted wing drosophila from May to September 2013.

The OSU Vegetable Pathology Laboratory diagnosed 280 plant samples from different counties throughout the state in 2013. Stakeholders were contacted with the diagnosis and provided management information. Three vegetable diseases new to Ohio were reported.

The OSU plant and pest diagnostic clinic processed 900 plant or insect specimens identified or diagnosed using modern or traditional diagnostic procedures. From these samples, 1020 individuals received diagnostic information. Samples examined represented 71 of Ohio's 88 counties, plus 6 other states, with 68% of specimens examined representing commercial interests.

Master Gardener Volunteers utilized their program training skills in the office on the Horticulture Helpline as well as at demonstrations, county fair displays, and other MGV events. MGVs spent 1,579 hours assisting approximately people online answering gardening questions through the OSU Extension Ask a Master Gardener program. They spent 4,920 hours answering questions in county offices on the horticulture helpline. They also spent 2009 hours in a variety of programs and projects directly focused on IPM.

The Ohio State University IPM website (ipm.osu.edu) was revamped to better convey the current emphasis areas, related university programs, non-university partnerships, and access to archived content of recent projects such as IPM Elements, Polyculture, and Parking lot production studies.

Changes/Problems

In the Urban IPM emphasis area, there was a change from implementing a "train the trainer" model as it related to teaching IPM due to a barrier teaching the Master Gardener trainers how to use the clicker technology. The new goal of this emphasis area is to hold a series of diagnostic workshops to form a link between the IPM oriented books and manuals they

have in their library with actual hands on experience diagnosing pest issues.