

**SERA003 2022 Annual Report for Florida**  
**Norman C. Leppla, University of Florida IPM Coordinator**

**BIOCONTROL OF INVASIVE ARTHROPODS AND ASSOCIATED CULTURAL PRACTICES** (Norm Leppla). Determined the occurrence, reproduction, and injury to fruit in an organic tomato crop bordered by sorghum. The stink bugs frequently probed and blemished tomato fruit in all stages of ripeness but fruit covered with probing sites were suitable for human consumption. Leppla, N. C., K. J. Stacey, L. M. Rooney, K. M. Lennon, and A. C. Hodges. 2022. Stink bug (Hemiptera: Pentatomidae) occurrence, reproduction, and injury to fruit in an organic tomato crop bordered by sorghum. *J. Econ. Ent.* (<https://doi.org/10.1093/jee/toac194>)

**CONTROLLING POPULATIONS OF PALM PHYTOPLASMA VECTORS IN PALM NURSERIES** (Brian Bahder). Palm School events were held in Broward Co. and Orange Co. Bahder, B.W. and Mou, D.F. Survey of field sites in Miami-Dade Co., Broward Co., and Orange Co. to identify suitable palms for collecting and identifying vector insects.

**DEVELOPMENT OF A REGIONAL CERTIFICATE PROGRAM IN POLLINATION ECOLOGY AND POLLINATOR HEALTH** (Jaret Daniels). A workshop talk was provided at the 2022 UF/IFAS Wildlife and Invasive Species Education workshop for Extension professionals, master gardeners, master naturalists, and others. Daniels, J., and F. Lavoipierre. 2022. *Public Garden. Insect Management in Public Gardens: A Novel Approach.* 37: 10-13.

**DEVELOP AND DISSEMINATE WEED SPECIES PROFILES AND IPM STRATEGIES FOR AGRONOMIC AND FORAGE/PASTURE SYSTEMS IN FLORIDA** (Pratrap Devkota). A student was trained in weed survey, compiling images for weed identification, developing a website and app, and drafting information on weed control methods and integrated weed management. In-service training in weed ID was provided to Extension personnel.

**DEVELOPING RECOMMENDATIONS FOR PRODUCING TROPICAL AND SUBTROPICAL FRUIT IN THE HOME GARDENS OF CENTRAL AND SOUTH FLORIDA** (Lauren Diepenbrock) A Doctor of Plant Medicine student is collating available resources to find knowledge gaps and begin assembling information into usable documents.

**ON-FARM WORKSHOPS TO PROMOTE ADOPTION OF IPM PRACTICES FOR SMALL FRUIT CROP PRODUCERS** (Sriyanka Lahiri). An on-farm workshop was held for small scale small fruit crop growers.

**PROMOTING IPM FOR MOSQUITO CONTROL IN SOCIO-DEMOGRAPHICALLY DIVERSE COMMUNITIES** (Estelle Martin). A survey for *Aedes aegypti* is being conducted.

**DEVELOPING IPM IN COLD HARDY AND RESIDENTIAL CITRUS** (Xavier Martini). A survey was distributed to homeowners on residential citrus in the Florida Panhandle. This was followed by an associated Extension event for stakeholders. Martini X. (2022) This is a good time to start scouting for rust mites. *Citrus Industry news.*

**EMPOWERING AG PROFESSIONALS WITH IPM/IRM RECOMMENDATIONS FOR AGRONOMIC CROPS: IPM EDUCATION REGARDING PEST SUSCEPTIBILITY AND RISK OF RESISTANCE TO INSECTICIDES AND BT CROPS** (Silvana Paula-Moraes). Shaw, T.J., Paula-Moraes, S.V., Hahn, P.G. and Specht, A. 2021. Seasonal Flight Patterns of *Chrysodeixis includens* (Lepidoptera: Noctuidae) in the Florida Panhandle and Inventory of Plusiine Species Cross-Attracted to Synthetic Pheromone. *J. Econ. Entomol.* 114: 2315-2325.

**LANDSCAPING FUNDAMENTALS, FUNDAMENTOS DEL PAISAJISMO** (Hannah Wooten). Completed GI-BMP training and certification.

# Texas IPM Program Update 2022

## 2022 Highlights

- IPM Program scouted 32,157 crop acres.
- Unit brought in \$6,693,566; \$3,875,030 federal, \$877,643 state, \$679,562 commodity, \$1,087,187 industry & \$175,044 fees.
- Delivered 931 presentations: 481 AgriLife, 185 industry, and 74 professional (34 invited professional).
- 75 publications; 18 Extension, 57 scientific (17 refereed journal articles), 2 book chapters, 22 proceedings, and 16 editor reviewed articles.
- Trained 451 county agents (22 events), 367 volunteers & 31 interns (120% increase in skills/knowledge among interns).
- Teaching: 3 formal courses (TAMU Commerce), 11 guest lectures (TAMU, WTAMU, Commerce, Texas Tech, Tarleton).
- \$33,938,814 impact on ag sector, 1,855,579 contacts (~440 contact hrs), 35 graduate students mentored (7 chaired).
- Released 162 newsletters, 103 Ag audio updates (587 subscribers, \$33/ac impact), 37 urban podcasts (8,758 downloads), 183 instructional videos, and performed 129 interviews.

## 2023 Goals

- Publish on-line course on cotton scouting and develop on-line course on corn scouting.
- Investigate strategies for managing Hessian fly in wheat.
- Increase the number of trainings and income at the IPM Experience House (Dallas).
- Major revisions to sorghum, forages, barn, dairy, poultry pest management guides.
- Increase acreage scouted.
- Continue to provide county support, publish Extension bulletins, audio outreach, and publish in scientific journals.
- Train graduate students, interns and volunteers.
- Continue to conduct responsive relevant applied research concerning pest management.

**SERA003 2022 Annual Report for South Carolina**  
**Francis Reay-Jones, Clemson University IPM Coordinator**

**Specialty Crop IPM. Fruit Tree IPM.** A workshop was held in person at Clemson University where specialists met and updated the MyIPM app content. Field trials were conducted to assess the efficacy of OMRI approved and conventional fungicides for disease management of peach. In-season horticultural oils for insect pest control and potential effects when combined with fungicides were also evaluated for control of San Jose scale and brown rot. Results were shared with stakeholders in production meetings.

*Vegetable IPM.* In a fungicide and pepper cultivar experiment in Fall 2022, nonsprayed cultivars differed significantly in susceptibility to anthracnose fruit rot. A fungicide sensitivity bioassay with cucurbit downy mildew showed that in Fall 2022, the isolate present in Charleston, SC, was sensitive to 9 of 12 fungicides tested, moderately sensitive to dimethomorph and resistant to azoxystrobin and mandipropamid.

Activities conducted by the vegetable weed science lab included establishment and maintenance of a weed garden used for weed ID training for growers, students and agents during field days. Demonstrations of herbicide symptomology pots in the greenhouse and plots in the field were shown to stakeholders. Variety trials were conducted with the USDA sweetpotato breeder and presentations were given on the potential to improve weed management without herbicides by selecting for sweetpotato genotypes with improved plant architecture. Different aspects of weed biology, weed ID, herbicide symptomology, emerging weed control technologies and cultural practices were presented at multiple field days and preplant meeting across the state in 2022-2023.

*Turfgrass and Ornamental Plant IPM.* A draft website was developed with information on turf and ornamental pest management with 27 pest profiles for turfgrass diseases, turfgrass insects, ornamental diseases, and ornamental insects. The website should launch in 2023.

**Agronomic Crop IPM.** Nematode surveys were used by growers and agents to help design nematode control programs on corn, cotton, and soybean using appropriate combinations of crop rotation, resistant varieties and nematicide applications. We collected and analyzed samples from 194 fields. For each farm, we discussed the appropriate plan of action on a field-by-field basis with growers/agents/consultants for the best nematode management scheme within the logistics of their individual farms.

In peanut, >400 copies of the updated peanut production guide were distributed over the past year, which include the developed defoliation diagram to assist in visualizing recommended harvest thresholds were distributed to stakeholders. Samples were collected from commercial production fields and examined for fungal sensitivity to commonly utilized fungicides.

Weed management practices were discussed or demonstrated at a number of county meetings and field days. Topics included cover crops for weed suppression, proper adjuvant selection in herbicides, and herbicide drift injury on cotton and soybean. In addition, combined strategies for management of herbicide resistant weeds, including Palmer amaranth and annual ryegrass.

Corn, cotton and soybean insect management training programs were conducted, including scout schools, grower meetings, and field days. Newsletters during the growing season provided trap catches of key pests and information on their management as the season progressed. The MyIPM for Row Crops was launched last year, and work is on-going on additional sections on wheat insects and diseases of cotton and soybean.

## SERA003 2023 Annual Report for Puerto Rico and US Virgin Islands

Wanda Almodóvar, UPR IPM Coordinator

Amy J. Dreves, UVI IPM Coordinator

**IPM Implementation in Specialty Crops: Root Crops** (Martha Giraldo & Wanda Almodóvar) Two training courses were held online for Agricultural Agents and Agronomists of the Department of Agriculture, and two presentational workshops for farmers about identification and integrated management of yam rust, *Goplana dioscoreae*, an emergent disease. Two trainings were held for farmers on yam rust IPM, including biosecurity measures they should implement in farms and demonstrations on how to disinfect the propagation material. In sweet potato, an IPM plan was developed for the Sweet Potato Weevil and delivered to farmers in two field days. Two posters and one pocket guide were produced to help farmers manage this pest. In sweet potato IPM a cartoon was developed of a superhero and a pocket guide as a comic booklet, including Best Management Practices, IPM, and nutritional facts. The pocket guide is in the revision process. The Extension Family and Consumer educators are implementing the educational campaign with 4H students, children in elementary schools, and the community.

<https://www.uprm.edu/sea/mdocs-posts/revista-sea-edicion-28/>

<https://www.facebook.com/groups/IDENTIFICA/permalink/5951398488206677/>.

<https://www.youtube.com/watch?v=Eywiki7-EZDs>.

**IPM Implementation in specialty crops: Ornamentals and Vegetables** (Edda Martínez, Dania Rivera & Amy J. Dreves) - Four consulting meetings were held to agronomists about poinsettia production, pesticide rotation, tool disinfection and photoperiod in poinsettias. Four field visits were held to advice and mentoring the poinsettia model growers on how to monitor whitefly populations. We collected whiteflies as preliminary data to compare after biological control liberation in the next poinsettia growing season. Two workshops were offered about BMP and IPM, in the *Cooltiva Pascuas Poinsettia Festival*, 2022 in the UPR Botanical Garden with 57 participants and 45 participants benefited from publications. 13 poinsettia and ornamental growers and one agricultural agent of the Puerto Rico western area were trained on pesticide rotation as part of an IPM program in Poinsettia on November 9, 2022. Publications: \*Edda Martínez, Dania Rivera and Amy J. Dreves. *Preliminary results for IPM implementation in specialty crops: Ornamentals and Vegetables*. Proceedings of the 43rd Annual Meeting of the Puerto Rican Society of Agricultural Sciences. Coamo, Puerto Rico.

**IPM Implementation in Specialty Crops: Vegetables-Cucurbitaceae and Solanaceae** (Amy J. Dreves, Edda Martínez, and Wanda Almodóvar)- During the year 2022, we identified 10 vegetable growers who produce both vegetable crop families, which include: 1) **Cucurbitaceae**-cucumber, squash, watermelon, pumpkin, zucchini; and 2) **Solanaceae**- tomato, pepper, and eggplant. Key pests that have been identified on the islands for the Cucurbit family have included the melonworms, aphids, mites, leafminers, armyworms, and downy and powdery mildew; and pests on the Solanaceae crops include the whiteflies, fruitworms, aphids, thrips, armyworms, leafhoppers, leafminers, and several fungal and bacterial diseases. We have photographed and illustrated the pests and diseases. We designed and drafted a PR-UVI **Extension Bulletin** and 4.25 x 5.5 inch **spiral-bound field pocket guide** for each vegetable family that includes photos, illustrations, identification features, life cycle of pests, monitoring, and management (prevention measures and best management practices). Olive, N.D. and Amy J. Dreves presented Vegetable Seed Varieties Suited for the USVI Environment at the 2022 Agriculture and Food Fair and held a field trip discussing IPM in tomatoes and cucumber plots on May 25, 2023 at the New Breed Farm on St. Croix. A farmer workshop was held on June 15, 2022 at the Virgin Islands Department of Agriculture (VIDA) tent to discuss a variety of crop families (including Cucurbitacea and Solanacea) and ways to minimize pests and diseases, and reduce pesticide use by promoting the IPM approach.

**IPM Implementation in Communities** (Dania Rivera & Amy J. Dreves)

Plant care and identification of common seasonal flowering plants including ornamentals, annuals, shrubs, palms, trees, and managed weeds and vines grown in Puerto Rico and US Virgin Islands is being created. We visited plant nurseries on both islands to identify plants adapted to the islands and those attracted to pollinators over the seasons. A list of ornamental plants that attract pollinators is currently available on the PR-IPM webpage (<https://www.uprm.edu/sea/ornamentales/polinizadoras/>). Field Pocket Guides are being developed highlighting

the Integrated Pest Management approach for growing Ornamentals and other plants. Also the development of a field pocket guide showcasing beneficial organisms (natural enemies) and pollinators associated with the flowering plants, including ornamentals is in progress. Best Management Practices, Beneficial Insects, Common Pollinators, and Common Pests and Diseases in Ornamentals. Publications: \*Dania Rivera, Amy J. Dreves and Wanda I. Almodóvar. 2022. **Plants for Pollinators and natural enemies in Puerto Rico and USVI communities.** \*Amy J. Dreves, Dania Rivera and Wanda I. Almodóvar. 2022. **Integrated Pest Management in the USVI and PR backyard communities.** Proceedings of the 43th Annual Meeting of the Puertorican Society of Agricultural Sciences. Coamo, Puerto Rico. In addition, three, 2.5-hour Pest Management titled: “Take a Closer Look- Pest Management and Pollinator Protection” and a 2-hour “Pest Monitoring & Identification using the Field Scope for Close-up Viewing” workshop as a backyard initiative with the Virgin Islands’ Department of Agriculture was presented to a total of 82 participants (St. Croix 40, St. Thomas 23, St. John 10, and Water Island with 9 participants) in collaboration with the VI Department of Agriculture Backyard Garden Initiative Program on August 16-17 and 22nd (St. Croix), September 4 (St. Thomas), September 5 (Water Island) and October 29 (St. John).

**IPM for Pollinators** (Ada Alvarado, Wanda Almodóvar, Amy J. Dreves) - One undergraduate student and two student associations of the UPR Agri-environmental Sciences Department were trained in the Pollinator Curricular Guide and are making activities to promote pollinators in the Alzamora farm pollinator garden to include other UPR Mayagüez Campus associations. Three trainings about how to promote pollinator friendly areas in farms were offered to farmers in the municipalities of Villalba, Las Piedras, Cabo Rojo, San German and Lajas. Six publications were produced about pollinator protection in forests and landscapes, <https://www.uprm.edu/sea/mip-publicaciones-ipm/>. Three activities were held, the first pollinator fair with participation of approximately 1,500 persons, a simultaneous field day in the Pollinator Gardens, **One Day with Pollinators**, with participation of approx. 500 persons. An exhibition and interview of the IPM for Pollinators initiative were offered at the Seed Fair celebrated at the UPR Experimental Station in Juana Díaz on September 2 to 3, 2022. We offered publications and offered consulting to Extension Agents and agronomists on how to promote pollinator friendly farms and gardens. The Master Gardener Volunteer Program was trained and will develop 5 Pollinator gardens throughout the island to disseminate the message to the community. Five additional pollinator publications were designed including a pollinator coloring book, support and protection of pollinators in the PR/USVI community, why pollinators are in trouble, steps to providing habitat; managed weeds and vines that attract pollinators; flower features that draw in pollinators; day and night pollinators of the USVI and PR, and the benefits of pollinator and natural enemy gardens using varying arrangements and designs.

**IPM Implementation in Animal Agriculture for Forage Crops destined to Feed Livestock** (Jaime E. Curbelo & Wilfredo Robles)- More than ten meetings with a graduate student, the co-PIs and a member of the graduate committee (Extension Expert in Drones) have been conducted to validate the software and drones to be used to collect the multispectral images. Two validation visits were performed at the Experimental Dairy Farm at Lajas to test the drone missions, insects, weeds, and forage biomass collections. The project’s methodologies were discussed with drone experts of BASF Agricultural Products in Guánica and we observed various drone missions using different applications. This information was used to choose the more appropriate app to analyze multispectral images as part of an IPM plan for forage crops in PR and UVI. One student was trained in the development and execution of field imaging missions. The list of tropical weeds was updated and the list of dairy farmers to be collected was validated based on the quality of their forages (poor vs excellent). We are currently reviewing published surveys about management practices associated with forage quality and insect and weed species richness in dairy farms.

**Priority Evaluation and Impact:** An evaluation plan titled the “Stairway to Sustainability and Land Stewardship” was completed and implemented in 2022 to measure farm program impact and adoption of IPM & BMP’s. An **iPM (innovative Pest Management)** Score Card for vegetable and fruit farmers was discussed by having field visits and conversations (2.5 hours each) with 17 individual farmers in the USVI. The iPM score card helped measure a user’s baseline level of IPM practice use. We identified at least 12 practices for each farmer to consider

for adoption and will converse again in March-April 2023 with follow-up visits. Four posters/talks relating to IPM and the “**Ladder of Sustainability and Farm Stewardship**”: **One Step at a Time**, were presented at three different conferences to stimulate conversation on ways to increase farmer adoption of essential practices. Two workshops were held in October 2022 on St. Croix and St. Thomas to teach farmers about ways to store and use pesticide products in tropical environments. A peer-reviewed Extension bulletin in a door hanger format was published (English) in August 2022 titled, *Managing Plant Pests in a Tropical Environment – farms and backyard gardens*, and distributed at events. University of the Virgin Islands- School of Agriculture-Cooperative Extension Service, Extension Bulletin 0003. Four IPM trainings that totaled 54 participants were developed on St. Croix (7 individuals), St. Thomas (29), Water Island (9), and St. John (9) for backyard growers and farmers on Pesticide Safety, Plant Health Prevention and Pest Management Tools (IPM) in July 2022. One presentation to St. Croix farmers, *Farmer Conversations about Pests and Pesticides* in collaboration with Virgin Islands Department of Agriculture (VIDA), “at Agriculture Fairgrounds on August 31, 2022 (35 participants).

**IPM Support for Pest Diagnostic Facilities** (Wanda Almodóvar & Martha Giraldo)- The UPR Mayagüez Campus Diagnostic Clinic and the Phytopathology and tissue culture laboratory in the Rio Piedras Experimental Station are collaborating to help farmers reduce crop losses by accurately diagnosing plant health problems and making reliable recommendations. Plantain and banana farmers were trained in biosafety practices they should implement in their farms. <https://youtu.be/uhpcuszbpGc>. Three field days were held in Camuy, Santa Isabel and Corozal to train farmers in early detection of diseases, prevention, and available management techniques in yam, sweet potato and tanager. Stakeholder engagement was promoted through these field days, and through virtual forums. <https://youtu.be/1EKf22v4zxE>, <https://youtu.be/Eywki7-EZDs>. Short bulletins on identification of the most common diseases and pests of vegetables and other crops are disseminated through the Plant Disease Clinic Facebook page, [www.facebook.com/clinicauprm/](http://www.facebook.com/clinicauprm/).



March 10, 2023

Francis Peter Fortnum Reay-Jones  
SERA03, Chair  
Clemson University

This is our 2023 IPM report for Kentucky. This past year we successfully completed our 1<sup>st</sup> year of the EIP 3-year grant and are partially through the second year. In terms of implementation of the EIP grant, we are still recovering from the 2010 tornado that destroyed the UKREC in Princeton Kentucky. Nearly 80% of the EIP funding supports IPM extension and implementation programs out of the Center for Grain Crops Excellence in Princeton. During the past year, IPM specialists moved their programs to various other temporary locations. Just in the past two months, temporary office and laboratory buildings have enabled specialists to begin to work again at the research station. Flooding in eastern KY in 2022 damaged our eastern Kentucky research station, but this had less impact on IPM programming.

#### **December 10, 2021 Tornado**

On the evening of December 10, 2021, a EF 4 tornado virtually destroyed the University of Kentucky Research and Education Center (UKREC) in Princeton, Kentucky. This facility just completed a \$17 million renovation that was finished just 2 years ago. Currently there are no



offices, labs, or necessary field equipment for the extension and research personnel at the station. The UK Grain and Forage Center of Excellence located here received 78.5% of the resources in the EIP grant to implement IPM programs within the center. While the damage from the tornado does not reduce our capacity to get the work done, it does create extreme challenges to overcome for the next several years.

Our IPM program is divided in six somewhat anonymous working groups; coordination, KATS, grain crops, vegetable crops, fruit crops, nursery crops, and Plant Disease Diagnostic Lab in Princeton. Our progress reflects this structure.

#### ***IPM Coordination:***

Our annual IPM Training School was held on Mar 8, 2023 participation increased compared to 2022 as this was moved to a different venue and held via zoom as well. The Insect field crop trapping network using pheromone trapping for field crop pests has been maintained in Lexington and at the UK REC in Princeton and is reported through Kentucky Pest News newsletter and IPM webpage.

#### ***KATS (Kentucky Agricultural Training School):***

The EIP grant supports an extension associate to coordinate multiple in-depth hands-on, field trainings to educate agricultural practitioners on IPM approaches for best management options associated with the production of grain, oilseed crops, forages and other activities. We had scheduled eight training events for the past year. Due to tornado destruction of UKREC in Princeton, training were moved to a local extension office. The training were adjusted due to difficulties in establishing crops due to field equipment destruction. The tornado shifted our focus from in-field hands-on trainings to electronic versions of educational training. Recording, editing and posting both in-depth and brief videos for posting to the KATS website associated with the production of grain, oilseed crops, forages and other activities.

***Agronomic Crops IPM:***

This working group is situated entirely in Princeton was severely impacted by the tornado. This past year, the working group has begun IPM deliverables, as temporary facilities and alternative work locations were established near the UKREC. The recovery effort and lack of infrastructure available to complete objectives have led to a delay until the fall of 2022 in hiring this individual to working on the objectives. However, temporary office and lab buildings structures arrived on site in in the late fall 2022.

***Fruit Crops IPM:***

Expanded outreach to small and limited resource fruit growers through in person and virtual trainings, with recordings available online, digital resources through social media, county newsletters, commodity groups, and other special interests. We are partnering with the Kentucky Horticulture Council to help distribute materials and promote resources. This past year, in conjunction with vegetable IPM, we held two IPM field walks virtually in addition to two in person field walks. These were held live with participants see live streamed video and being able to make comments and ask questions. Maintaining an alert system for chronic and emerging pest issues using a grower alert system for chronic and emerging pest issues in conjunction with our county agent network, extension specialist and associate cooperators, and university diagnostic labs to monitor grower problems and concerns.

***Vegetable Crops IPM:***

Expanded outreach to new and limited-experience growers and limited resource growers with high tunnels and low acreages through a high tunnel a virtual tomato webinar/field walk that was live streamed from the field. YouTube videos and a commercial vegetable webinar were used to deliver IPM programming more broadly across the state. These trainings provided outreach to county extension agents and clientele on IPM, soil health and fertility including IPM Specialists presentation at the Annual Fruit and Vegetable Conference and a half day at the IPM training school. A commercial vegetable grower listserv has been established to provide timely updates to growers. The demonstration high-tunnel trial is underway addressing irrigation, nitrogen, and *Sclerotinia* management. We have begun planning the trainings and outreach for county agents as well as creating videos of our demonstration trial to use for later trainings. We plan to have a again virtual field day this summer to showcase all of demonstration work.

***Nursery Crops IPM:***

Empowered county Extension professionals with up to date, environmentally and economically sustainable IPM practices that they will then pass on to homeowner clients. A 6-part Zoom series for Extension agents focused on ornamental plant pests and pathogens initiated. To increase the frequency of scouting for pests in Kentucky nurseries and reliance upon integrated pest management approaches to pest populations before they reach outbreak levels we are building the Kentucky Pest Alert System, a text message-based service to mass text message to registered growers that they need to go out and look for specific pests. We have identified 15 different



nurseries and growers that are willing to volunteer as sites for a temperature data logger to track growing degree days in nurseries.

***Enhancing Princeton PDDL:***

While our objective was to expand staffing in Princeton PDDL to increase awareness of and surveillance for new and emerging threats to plant health, develop social media engagement programs, apply accreditation standards of the National Plant Diagnostic Network, and conduct conducting surveys and providing outreach on the importance of diagnostics in disease surveillance and monitoring. With the destruction of the lab, temporary facilities will hopefully become available soon. Plans were underway to hire this person, who would be located at the UKREC in Princeton, KY. The F4 tornado destroyed over 40 of the 48 buildings. The recovery effort and lack of infrastructure to complete objectives have led to a delay in hiring and completing these objectives. However, temporary office structures are scheduled to arrive on site in June, and a position description for an individual to work toward the objectives outlined in the grant has been approved by UK. Our hope is to begin on the deliverables as soon as temporary facilities are in place.

Sincerely,

A handwritten signature in cursive script that reads "Ricardo Bessin".

Ricardo Bessin  
IPM Coordinator, KY

## **VIRGINIA ANNUAL REPORT FOR SERA3**

Virginia's interdisciplinary IPM team provides statewide education and information to a diversity of clientele in four priority areas: 1) IPM Implementation in Agronomic Crops, 2) IPM Implementation in Specialty Crops, 3) IPM for Pollinator Health, and 4) IPM Support for Pest Diagnostic Facilities. Accomplishments during 2022-2023 in each priority area include:

### **PRIORITY AREA: IPM IMPLEMENTATION IN AGRONOMIC CROPS**

- Cooperated with Virginia Tech, University Libraries to create an open repository platform within VTechWorks to house an Extension digital media library. Currently, over 360 digital images and videos (including appropriate metadata) on various IPM and pesticide safety topics have been uploaded.
- Collaborated with Clemson University and the Southern IPM Center to develop a MyIPM app for field crops.
- Red imported fire ant (RIFA) public education activities were conducted, and three Extension publications/checklists on RIFA were developed for various audiences.
- On-farm and on-station demonstrations for control of insect, weed, and plant parasitic nematodes are being prepared for 2023 season.

### **PRIORITY AREA: IPM IMPLEMENTATION IN SPECIALTY CROPS**

- Presentations and webinars focusing on management of insects and weeds in nursery crops were presented to stakeholders.
- Videos were prepared on the biology and identification of key weed species in nurseries.
- On-farm and on-station demonstrations for control of insect and weeds in nursery crops are being prepared for 2023 season.

### **PRIORITY AREA: IPM FOR POLLINATOR HEALTH**

- A network of Virginia Cooperative Extension (VCE) agents interested in learning more and working closely with honey bees and pollinator health were recruited to become "Virginia Bee Cooperators (VBC)". Members of the VBC network will assist in the development and dissemination of appropriate information and VCE publications.
- Extension teaching apiary programs that support regional training of VCE agents, Virginia 4-H participants, and beekeepers are being prepared for 2023 season.
- The "protecting honey bees" section of VCE Pest Management Guides currently being updated. Toxicity data of registered pest management compounds is being reorganized to more clearly communicate risk in pollinator exposure situations.

### **PRIORITY AREA: IPM SUPPORT FOR PEST DIAGNOSTIC FACILITIES**

- Virginia Extension working group for Spotted Lanternfly underway.
- Over 70 plant problems and 300 plant disease digital images added to the Plant Problem Image Gallery (PPIG).
- Weed, plant pathogen, and arthropod diagnoses and IPM-based recommendations delivered to commercial and non-commercial growers and landscape professionals.

## 2023 GA State IPM Report

The overall goal of this project is to develop transdisciplinary IPM programs utilizing the most updated scientific information and help stakeholders to implement those programs in order to minimize environmental and economic risks associated with insects, pathogens, and weed pests and their management at the state, regional and national level. During this reporting period, IPM specialists have worked with stakeholder to implement IPM programs to address pest problems in many commodities across the state. The most significant accomplishments are briefly described in the text below:

**IPM Implementation in Agronomic Crops: (Peanut and Cotton): Objectives:** 1) Develop and refine effective management programs for rootworm complex (Peanut); 2) assess effectiveness of TSWV resistant genotypes; 3) survey commercial farms and processing facilities for incidence of fungal diseases and aflatoxin, and update Peanut Rx (Peanut); 4) Evaluate chemical as well as cultural strategies based on pest (aphid) and crop phenology and use that develop sustainable IPM programs (Cotton); and 5) Disseminate the new information to stakeholders (Peanut and Cotton).

**Accomplishments, outcomes, impacts: Objectives:** 1) Trials were conducted to determine the abundance and distribution of rootworm in peanuts and to evaluate efficacy of selected insecticide modes of action and use patterns. Data are being analyzed to update recommendations. 2) Field trials revealed that the newly released field resistant cultivars were often not effective as standalone options and will require an integrated approach to reduce the risks posed by thrips and TSWV. Findings were used to fine tune the risk management index to assist growers to make the optimal risk reduction choices associated with planting peanuts. 3) Based on results of multiple field trials, Peanut Rx was fully refined for 2021 and 2022 seasons. The Peanut Rx Team met "in-person" in December 2021 at George T. Bagby State Park. The Index was made available to growers in Georgia, Mississippi, Alabama, Florida, and South Carolina through a new web-based interactive tool, through production guides, and through Industry fact sheets. 4) Seven active ingredients were evaluated for cotton aphid control; top performers provided 86 to 92 percent control and no significant response in yield was observed among treatments. Trials completed in the fall of 2021 are consistent with previous years in that aphid management does not significantly affect cotton yield nor incidence of CLRDV. 5) Findings were synthesized to update pest management recommendation which were disseminated to growers. Growers who implemented UGA pest management recommendations saved millions of dollars in crop losses.

### **IPM Implementation in Animal Agriculture: (Poultry and Beef Cattle)**

**Objectives:** 1) Evaluate new chemicals and other alternative strategies to control insect pests of poultry (broiler and caged layers) and beef cattle and develop effective IPM programs; 2) Develop monitoring programs to tack ALT; and 3) disseminate this information to poultry and beef cattle producers.

**Accomplishments, outcomes, impacts: Objectives:** 1) Several new products, treatment methodologies, and suppression strategies were evaluated under field conditions throughout the state and findings were used to develop IPM recommendations. 2) Sampling methodologies were optimized for surveying cattle ticks under field conditions. Having established these baseline

data, we are better prepared to monitor for arrival of ALT as it spreads through the Southeast. We are working in collaboration other researchers in the southeastern US to initiate environmental monitoring while checking for the invasive tick on alternative hosts such as wildlife and domestic pets. and 3) These findings were shared with poultry and beef cattle producers and used to update IPM recommendations in the Georgia Pest Management Handbook.

### **IPM Implementation in Specialty Crops: (Blueberries, Peaches, and Vegetables)**

**Objectives:** 1) Develop more sustainable IPM programs based on recent research findings to effectively manage SWD (Blueberry); 2) Evaluate new and alternative fungicidal spray programs for managing QoI-resistant anthracnose fruit rot (Blueberry); 3) evaluate effectiveness of new herbicides and orchard floor coverings to manage weeds in young blueberry orchards (Blueberry); 4) Evaluate effectiveness of pheromone-based mating disruption as a strategy to control SJS (Peach); 5) Evaluate the efficacy of plant defense inducers, growth regulators, and systemic chemical applications on PPD trees (Peach); 6) Develop and implement resistance monitoring and management plans for sweet potato whitefly and DBM (Vegetables); 7) demonstrate and help farmers implement effective IPM programs for center rot of onion (Vegetables); 8) Evaluate host plant resistance and cultural strategies to control FAW (Turf); 9) Conduct dollar spot surveillance in the field and develop management strategies (Turf); and 10) disseminate this information to blueberry growers (Blueberry, Peach, Vegetables and Turf).

**Accomplishments, outcomes, impacts: Objectives:** 1) Effectiveness of new reduced-risk insecticides and behavioral control tactics was evaluated and findings were used to update season-long SWD management programs. 2) New and alternative fungicide programs for QoI-resistant anthracnose fruit rot are under way. 3) Trials were conducted to evaluate safety and efficacy of Dual Magnum (S-metolachlor) in blueberries. 4) Trials were conducted to evaluate efficacy of two pheromone formulations in mating disruption of San Jose Scale (SJS). Results showed that trees under the mating disruption treatments had an average of four to five times fewer SJS crawlers than the control trees. 5) Trials were conducted on PPD trees to evaluate efficacy of Actigard, K-phite, Maximizer, ProGibb40SG, and RIO in peaches. Initial results were shared with stakeholders and the trials will be repeated in 2022. 6) A total of 21 LC50-based trials have been completed to screen whitefly populations for resistance so far using cotton as the standard host for all trials. The four vegetable crops are being cultivated at four different sites to serve as hosts for establishing whitefly field populations. Weekly scouting and monitoring are underway to identify the current timeframe for the whitefly invasion in the cotton belt region. 7) Integrated approach with copper-bactericide, insecticide (thrips control) and herbicide program considerably reduced center rot incidence in bulb compared to the onion grower's standard. Implementation of this program can result in a total profit of \$8.8 million for onion farmers. 8) In our host plant resistance characteristics survey, all tall fescue cultivars/lines performed better than zoysiagrass 'Zeon'. 9) In the disease survey, several isolates were genetically identified based on their sequence of the Internal Transcribed Spacer (ITS) region. 10) Findings were shared with specialty crop growers and used to update IPM recommendations in the Georgia Pest Management Handbook.

**IPM for Pollinator Health: Objectives:** 1) To increase the amount of sustainable pollinator habitat across the state; 2) to increase the entomological literacy of our citizens in regards to beneficial insects; and 3) to generate data of Georgia's pollinator populations.

**Accomplishments, outcomes, impacts: Objective.** 1), 2), & 3): Maps of the pollinator gardens created as part of this project were generated by Hamilton Gardens showing the locations of the new gardens across the state. These are posted on the website (<https://GGaPC.org>). Data from all three Censuses were finalized and placed on the website as well. This data is being used by researchers as well as educators who are using it for the STEM curriculum. The educational materials have been updated for the 2022 Census and social media outlets are being used for educational purposes.

**IPM Support for Pest Diagnostic Facilities: Objectives:** 1) Develop, optimize and provide fungicide resistance testing services for multiple crop-pathogen combinations to enable timely and effective disease management; 2) Conduct regional monitoring for citrus greening to safeguard Georgia's commercial citrus industry; and 3) empowering county agents through on-site diagnostics.

**Accomplishments, outcomes, impacts: Objectives:** 1) Rapid, lab-based fungicide resistance assays were developed and validated for blueberry, peanut, strawberry, and turfgrass pathogens. 2) Two of the 212 samples tested positive for HLB during this time period. One of the positive tests was the first report in Grady County and came from a commercial citrus tree. This is only the third HLB-positive tree from a commercial planting in Georgia. 3) Agdia lateral flow tests for *Xylella fastidiosa* were distributed to Extension agents in two Georgia wine grape-growing counties to aid in the diagnosis of Pierce's disease and 6 out of 11 samples tested positive. Similarly, 48 *Acidovorax citrulli* immunostrips were used to detect suspect seedling in greenhouse and 93 *Phytophthora* spp. immunostrips were used to detect pathogen cucurbits and pepper in field & storage.

**Coordination:** The UGA IPM Program: 1) hosted the second training of the newly created UGA IPM Academy, focusing on blueberry production in the southeast; 2) recorded and published several episodes of the newly created IPM on the Fly Podcast, 3) continued to develop monthly IPM content for agents and growers to use in their counties; 4) updated the IPM website; and 5) updated and published 2022 Commercial Edition (Volume I and II) and 2022 Home & Garden Edition of Georgia Pest Management Handbook which is the most widely used IPM resources in Georgia and across the southeastern US.

SERA003 2022 Annual Report for Tennessee

Prepared by Heather Kelly, University of Tennessee, IPM Coordinator

IPM Implementation in Agronomic Crops – Continued to develop and update web-based IPM applications for field crops management and had over 300 fact to face contacts about IPM management including cover crop management data and thousands have accessed our online resources. 54 county agents received IPM in-service training. Continued monitoring and reporting of native and exotic insect pests and diseases, including Bt- and fungicide-resistance; where a slight shift in sensitivity to DMI fungicides for the frogeye leaf spot pathogen (*Cercospora sojina*) and new report of BMSM went out on Eddmaps. Additional information on characterization and management of dicamba resistant palmer amaranth was developed and distributed to clientele, with over 2,000 stakeholders receiving information. Based survey work evaluating information generated and disseminated on adaptation of experimental and commercial cotton cultivars to field production environments in Tennessee, 101 lb/acre value was estimated for using UT cotton cultivar data to increase yield by picking optimum cultivar for cotton acreage, based on 75% of TN acreage gaining this value a total increase of ~\$20 M was gained. Over 2,000 agricultural stakeholders received information on N management in corn.

IPM Training and Implementation in Housing - Previous monitoring results will be compared to the 2022 results to determine if bed bug populations have decreased or increased as a result of the pandemic. Document the effect of COVID-19 on bed bug presence in low-income senior housing. The greatest increase in pest severity during the pandemic was noted for cockroaches with the most common reason being due to limited treatment during COVID; others noted regular housekeeping inspections were on hold too so poor sanitation may have contributed. After training at the 7th Annual meeting, we documented a 62% increase in monitor use in the home, business, or buildings and a 68% increase in building-wide inspections this year compared with previous years.

IPM Training and Implementation in Schools – Getting ready to start demonstrations on fire ant management through broadcast bait demonstrations for school personnel. Results from investigating black-legged tick and other tick presence in East Tennessee, found that of the 117 tick drags made to school properties between March 2021 and January 2022, 192 lone star ticks, 2 Gulf coast ticks, 12 American dog ticks, and 42 blacklegged ticks were detected. Thus far, ticks were found on 19 of 48 school properties. 100% of the Extension agents attending the 2021 in-service trainings on bed bugs, fire ants and other household pests indicated we provided information needed for their job.

IPM Education of Pesticide Applicators

New modules including Herbicide and Fungicide Classification and Beneficials, Predators and parasites are 50% complete. Pre- and post-tests on IPM knowledge was conducted in 2021 for 975 commercial applicators. With incorporation of IPM knowledge into areas of structural & general pest control and horticultural & landscape pest control, it is expected to reduced unwarranted pesticide application by 10 and 20%, respectively.

IPM Implementation in Specialty Crops - Conduct fungicide efficacy trials for key specialty crop diseases including tomato early blight and cucurbit powdery and downy mildew and from



recommendations developed from this work growers will select fungicides with optimal efficacy and avoid fungicide resistance problems. Cucurbit downy mildew sentinel have been established and by following extension recommendations developed from this work growers will make the most efficient fungicide applications and reduce losses to cucurbit downy mildew. From vegetable variety trials growers are learning about the risk posed by planting tomatoes in a field with a history of *Phytophthora nicotianae* (black shank and/or buckeye rot), and will be able to select varieties with resistance or tolerance to the disease to avoid yield loss.

Pollinator Health - Developing training on antibiotics and beekeeping for veterinarians where future veterinarians will have knowledge of how to diagnose/treat bee diseases. 200+ beekeepers learned how to monitor for mites (50+ involved in hands-on demo). 150+ TN citizens increased identification & knowledge of pollinator habitat management. 30+ agents increased knowledge of timely beekeeping issues & habitat establishment.

Across all areas of IPM implementation professional development was advanced through specialized training programs that were provided to independent crop consultants, retailers, county agents, pesticide applicators, and other stakeholder groups. Investigators were afforded many opportunities to collaborate with each other and other scientists and develop and participate in training programs and professional society meetings to advance their skills. Additionally, graduate and undergraduate students were also trained.