



# **2015 ANNUAL REPORT**

**Southern Integrated Pest  
Management Center**

# Southern Integrated Pest Management Center

The Southern IPM Center serves 13 U.S. Southern states, Puerto Rico and the U.S. Virgin Islands and is supported by a grant from USDA's National Institute of Food and Agriculture.

## Staff:

Danesha Seth Carley, Co-Director  
919-513-8189  
danesha\_carley@ncsu.edu

Joseph LaForest, Co-Director  
229-386-3298  
laforest@uga.edu

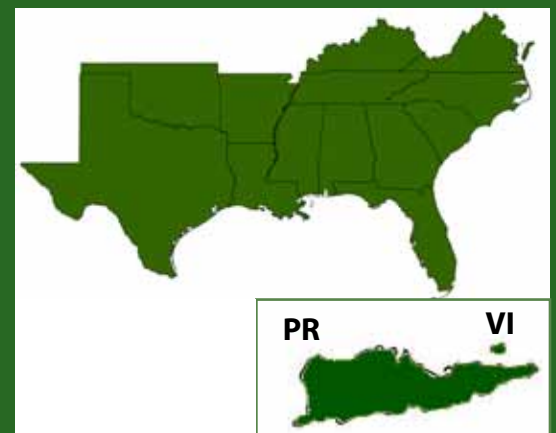
Henry Fadamiro, Associate Director  
334-844-5098  
fadamhy@auburn.edu

Jean-Jacques Dubois, Impact Evaluation Specialist  
919-515-0496  
jbdubois@ncsu.edu

Alex Belskis, Programmer  
919-513-8183  
abelskis@cipm.info

Robin Boudwin, Programmer  
919-513-0494  
rboudwin@cipm.info

Rosemary Hallberg, Communication Director  
919-513-8182  
rhallberg@sripmc.org



# Table of Contents

<b>From the Directors' Office .....</b>	<b>4</b>
<b>About this Report .....</b>	<b>5</b>
<b>Network with Stakeholders .....</b>	<b>6</b>
<b>Build Partnerships .....</b>	<b>8</b>
<b>Develop Signature Programs .....</b>	<b>10</b>
<b>Communicate Success: 2014 Projects .....</b>	<b>11</b>
<b>Communicate Success: Featured Projects .....</b>	<b>15</b>
<b>Friends of IPM Awards.....</b>	<b>18</b>

# From the Directors' Office

We are excited to present the progress the Southern IPM Center has made in the past year and highlight some changes that are shaping the future of our programs.

This was the first year that our IPM Enhancement Grant competition was presented as an outcome based model. Applicants were required to present their projects in light of not only what products would be produced, but what impacts the projects would have on stakeholders and the initial problem they set out to address. We are looking forward to continuing this model in the coming year and are excited to see the reports from the project directors who were funded last year.



Danesha Seth Carley

As part of our emphasis on evaluating the impact our programs have, we recently hired Jean-Jacques Dubois as our evaluation specialist. Over the 8 months, he has been very busy working with our Enhancement Grant awardees, consulting with research and extension personnel throughout the region, and examining the core programs of the Center for ways we can better capture and articulate the impacts we have on IPM development and adoption.

Facilitation of Innovation Through Technology (FITT) continues to support programs in the region with simple solutions to collect information and distribute it to stakeholders. Most recently, it has been working with the newly formed Tawny Crazy Ant Working Group and members of SERA-003 to manage reports of pests using the Southeast Early Detection Network. This provides instant routing of reports to local verifiers, follow-up information with the reporter, and real-time updating of maps as reports are verified. Because the maps update automatically, they are always up-to-date on all websites where they have been shared.



Joe LaForest

We are also looking forward to hosting the first Southern IPM Roundtable on March 16-18 in Raleigh, NC. This meeting provides an excellent opportunity for technical committees, project directors, and working groups to hold their annual meetings with collaborators from around the region. We hope that the convenience and location of the Roundtable (immediately following the end of the Southeastern Branch ESA meeting), will help to promote deeper engagement among all leaders of IPM in the region.

SIPMC is pleased to announce the formation of the Pollinator Protection Work Group, formed as part of SIPMC's Signature programs. The work group will work together to enhance public understanding of the importance of pollinators and pollinator-health, and develop and disseminate information about IPM practices that will protect pollinators.



Henry Fadamiro

Finally, we have one change in the past year that we find bittersweet - the retirement of Jim VanKirk. Jim has been a constant for the Southern IPM Center for the past 11 years - not only shaping its future and growth but also enabling its success. His no-nonsense approach and ability to bring people from different backgrounds to the table to directly address difficult issues and find effective solutions has been inspiring. As we wish him well in retirement, we are grateful for the example he has set and foundation he has laid for the future of IPM.

# About this Report

This annual report is a compilation of the activities of the Southern IPM Center for the 2014-15 fiscal year. The Southern IPM Center is one of four regional IPM Centers funded by a USDA National Institute of Food and Agriculture (NIFA) grant.

The Southern IPM Center's goals reflect broader goals of IPM as expressed in the National IPM Roadmap: to sustain and enhance environmental, economic and human health by applying IPM in all appropriate settings. SIPMC's role in the context of these grand global goals include:

- To increase coordination and improve efficiency of IPM research and extension efforts by organizing timely responses to emerging issues of regional importance;
- To facilitate collaboration by acting as a focal point and facilitator of communications that promote sound IPM-related decisions;
- To promote further development and adoption of IPM through regional information networks, collaborative team building and broad-based stakeholder participation;
- To document the impacts and value of IPM strategies, techniques, programs and projects, building support for IPM among the general public and public policymakers.

## Mission

The mission of the Southern IPM Center is to foster the development and adoption of IPM to generate economic, environmental and human health benefits. We work in partnership with stakeholders from agricultural, urban and rural settings to identify and address regional priorities for research, education and outreach.

## Objectives

In 2014-15, the Center worked to fulfill four key objectives:

**Objective 1:** Establish and maintain information networks that engage extension and other IPM-related programs and expertise operating at the national, state and local levels.

**Objective 2:** Build partnerships to address challenges and opportunities. Involve stakeholders in identifying needs and priorities for IPM in agriculture, food and natural resource systems and focus resources on addressing those priority needs.

**Objective 3:** Develop signature global food security programs.

**Objective 4:** Evaluate and communicate successes.

# Network with Stakeholders

Because our true stakeholder network includes farmers, ranchers, foresters, school staff, parents and children, SIPMC relies on feedback from a variety of sources. The Regulatory Information Network keep us informed of stakeholder needs in regards to regulatory decisions made by the Environmental Protection Agency. The Advisory Council and Steering Committee members represent a range of various stakeholder entities and assist us with policy and direction. In addition, we meet with stakeholders during conferences and meetings, or while gathering information for online resources.

## Regulatory Information Network

The primary function of the Regulatory Information Network (RIN) is to address regulatory decisions regarding IPM, most often involving pesticide registrations. To accomplish this task, we engage “RIN liaisons” at Land-grant universities across the region to facilitate two-way communications between regulatory agencies – primarily US EPA – and the stakeholders affected by pest management regulations.

Until the end of 2014, the RIN was comprised of four RIN liaisons, each responsible for connecting multiple states or territories into the regional network. In January of 2015, SIPMC adopted a new “proactive” approach to recruiting RIN liaisons. EIP coordinators in each state/territory under SIPMC’s purview were contacted and encouraged to apply as their state’s RIN liaison. This allowed for every state and territory to actively participate in the network, as well as to receive a modest amount of funding. To date, we have 13 active RIN liaisons, and each state and territory in the South is covered by our network.

The RIN liaisons include:

- Henry Fadamiro - Alabama
- Glenn Studebaker - Arkansas
- Norm Leppa - Florida
- Joe LaForest - Georgia
- Patty Lucas - Kentucky
- Clayton Hollier - Louisiana
- Wanda Almodovar - Puerto Rico
- Danesha Seth Carley - North Carolina and Mississippi
- Kelly Gilkerson - South Carolina
- Mark Matocha - Texas and Oklahoma
- Darrell Hensley - Tennessee
- Mike Weaver - Virginia
- Joe Williamson - Virgin Islands

RIN liaisons are in the process of updating a comprehensive and robust stakeholder contact database—called an “experts list”— for important settings in their state, as well as a list of updated state priorities from their stakeholders.

# Network with Stakeholders

## Advisory Council and Steering Committee

Our goal with the Advisory Council is to improve SIPMC effectiveness by enhancing involvement of key stakeholder groups in the region. Between meeting dates, online communication is used to update, collect feedback from, and otherwise engage the Council membership throughout the year.

SIPMC's newly re-formed Advisory Council meeting was held October 2014. The meeting was well-attended and focused primarily on strategic planning, updates on Signature Programs and the new Information Supplement.

Advisory Council members encouraged us to pursue everything we proposed and provided suggestions on how to develop some programs like eAcademy. They also gave their approval for our switch to an outcome based funding model for our Enhancement Grant Program RFA. All members have been signed up for both our newsletter managed through MailChimp and a Basecamp project devoted to the Advisory Council. This coming year we will meet with the Council in September.

The Steering Committee consists of a subset of the Advisory Council, including the SIPMC directors, past chair of SERA003, a member of the Regulatory Information Network and an Extension Administrator.

## International IPM Symposium

The IPM Symposium provided a vehicle for us to meet with several stakeholders in one meeting. The Regional IPM Centers hosted a joint booth to display both Center products and technology. The booth gave us the opportunity to engage with general attendees, whether or not they were already familiar with our Center. The IPM Centers also helped set up the smartphone app for the meeting program. This allowed us to include basic information on the IPM Centers to help raise awareness of our programs among meeting attendees.

The SIPMC directors attended SERA003's annual committee meeting, held just prior to the IPM Symposium in March 2015. The meeting also gave us the opportunity to let them know about new Center services.

## IPM Resource Database

SIPMC is working with the Northeastern IPM Center on a national IPM resource database. The database will provide a searchable clearinghouse of IPM-related materials pertaining to commodities and settings within the southern region. Items from this listing can be called dynamically into other third party applications to decrease the time it takes for someone to find quality information, and improve the speed with which new electronic materials can be brought to the attention of both IPM practitioners as well as those providing education and training in Integrated Pest Management.

SIPMC staff have been reviewing the content of the existing website and identifying documents and other resources that can be moved to or listed in the IPM Resource Database.

# Build Partnerships

The Southern IPM Center is a regional network that builds and maintains mutually beneficial partnerships that successfully identify and address challenges and opportunities in IPM.

In general, our partnerships follow the same idea as our networking: we partner with a multitude of groups, both regionally and nationally, to advance IPM in the U.S. More specifically we invite experts throughout the nation to band together with a common goal. These invitations have brought individuals together to form working groups to solve regional pest issues and provided technical tools for IPM professionals to use to facilitate their networks.

## Working Groups

SIPMC supported four working groups last year that are bridging gaps between the “hands in the field” and federal and research decisions.

### School IPM Working Group

Janet Hurley (Texas A&M AgriLife), with co-chair Fudd Graham (Auburn University) continue coordinating the group’s contribution to the eXtension Urban IPM Community of Practice. This past spring Hurley received an IPM Enhancement award to quantify the costs of School IPM. This project follows up on the IPM cost calculator and will attempt to gauge the level of IPM at various schools in three regions as well as estimate the cost benefits of IPM in schools. This study is the first attempt to estimate the cost of implementing IPM in schools. The results of this study will enable school officials, IPM coordinators, and the IPM industry to make the first research based recommendations regarding the level of IPM to implement in school districts across the nation.

### Southern Nursery IPM Working Group

This group, also called SNIPM, received the 2014 Friends of Southern IPM Bright Idea award for technology innovations that are directly benefiting nursery crop growers. Last year the group used a 2014 IPM Enhancement grant to hold an experiential IPM workshop for Cooperative Extension agents and growers. Attendees learned the basics of identification, calculation of soil physical properties, irrigation assessments, and scouting, and all activities were hands-on. More information about the workshop and its impacts on growing practices is provided on page 16.

The group also received a 2015 IPM Enhancement Grant award to produce a second volume of the IPM for Shrubs iBook series.



Nursery growers learn how to ID weeds at the experiential IPM workshop. **Photo credit:** Anthony LeBude

### Tawny Crazy Ant Working Group

The tawny crazy ant working group is a new working group funded by a 2015 IPM Enhancement grant. During the first meeting, the group established extension, research and regulatory priorities for integrated management of the tawny crazy ant. As part of this project, the group will also discuss the most effective ways to track this pest.

### eFly

The Spotted Wing Drosophila Working Group, or eFly, began as a regional meeting funded by a 2012 SIPMC Critical Issues grant. The goals of this group are to facilitate coordination of SWD research, extension and education activities, and to maintain and update SWD impact statements in the eastern U.S.



# Build Partnerships

Although SIPMC is not currently funding eFly, we continue to liaise with the group, and members have been successful in obtaining additional funding from the Specialty Crops Research Initiative and IPM Enhancement grant program. The group maintains an online SWD monitoring and mapping system at <http://www.eddmaps.org/swd>.

## Small Farms Working Group

Led by Dr. Henry Fadamiro with Auburn University, the Small Farms Working Group met for the first time in 2012. The working group consists of extension specialists with both 1862 and 1890 universities who work with specialty crop farmers. The key mission of the SFWG is to facilitate implementation of alternative IPM practices by smallholder farmers across the southern region through communication, networking, and extension /outreach activities that focus on the 1862 and 1890 land-grant institutions.

Despite some challenges in the past year, the group held a meeting in June 2015 at Alcorn University in Mississippi that was attended by representatives from most of the 1890's.

## Southern IPM Roundtable

This is a new project that proposes to bring various groups together for a 3-day conference to share ideas and success stories. The Roundtable is a two- to three-day regional conference to be held during the "off" years of the International IPM Symposium cycle. This multi-program forum will offer excellent opportunities for PDs to engage with others with common interests, in particular pests, disciplines, crops, methods or other areas of research. The Roundtable will include the SERA003 annual meeting, working group or other technical committee meetings, and project director workshops.

We are currently working with SERA003 and the coordinating staff from the Southeastern Branch of the Entomological Society of America to organize with first Roundtable on March 16, 2016, in conjunction with the Southeastern ESA branch meeting in Raleigh, NC.

## IPM eAcademy

This new program, to be located on the National IPM website, will feature online presentations and webinars addressing important IPM-related issues.

The SIPMC hosted 10 webinars on February 23-27 to help celebrate National Invasive Species Awareness Week. These represented the first materials that were added to the eAcademy. As we were still determining the workflow for content posting into eAcademy, they were manually added to a page at <http://www.ipmcenters.org/ipm-eacademy/>. The live webinars had 152 attendees although some individuals attended multiple sessions. The recorded sessions were posted to the Southern IPM Center YouTube channel and have received 637 views with 4,834 minutes of content being consumed. From the presentations that were given, one presenter was considered exceptional and has been nominated for TED talks.

We also added a session we recorded at the National IPM Coordination Committee Meeting where Dr. Ramaswamy gave the State of NIFA Address. This has received 44 views with 306 minutes of video watched.

# Develop Signature Programs

Signature Global Food Security Programs have been important components of all Regional IPM Center grants since 2011. Our portfolio of Signature Programs continues to evolve.

**Grants Programs:** The SIPMC's internal grant programs provide two levels of timely response to important IPM issues. Both programs address challenges such as invasive species, pest resistance, and impacts resulting from regulatory actions.

**Critical and Emerging Issues Grants Program:** This program provides an opportunity to address and possibly prevent minor problems before they become major concerns and respond directly to high priority challenges. The critical and emerging issues small grants program supports important developmental work like gathering preliminary data, estimating the scope and risk associated with a pest problem, and developing a network of key people who will effectively contribute to addressing the issue. Last year we sent one researcher from the southern region (at NC State University) to participate in a National Brown Marmorated Stink Bug (BMSB) Conference.

**IPM Enhancement Grants Program (IPMEP):** This grants program is a foundational mechanism used by SIPMC to address important issues affecting the region. It has produced many significant outputs and favorable outcomes addressing Global Food Security challenges including invasive species, endangered species, pest resistance, and impacts resulting from regulatory actions.

In winter of 2014, we conducted an online survey to help assess stakeholder valuation of funding limits and project period. We updated our RFA to focus on a more "Outcome" driven model. We received 15 applications, and funded 10 projects:

**Organize and set priorities for a Southern region tawny crazy ant working group**

Lawrence C. "Fudd" Graham, Auburn University

**Quantifying the financial costs and benefits of school IPM: a collaborative workgroup project**

Janet Hurley, Texas A&M AgriLife Extension

**IPM for shrubs in southeastern U.S. nursery production (Vol. II)**

Matthew Chappell, University of Georgia

**Pest risk assessment and IPM tactics to monitor and control wireworms for North Florida sweet potato growers**

Norm Leppa, University of Florida

**Novel *Alphitobius diaperinus* control strategies -- Diatomaceous earth and *Beauveria bassiana***

Nancy Hinkle, University of Georgia

**A new approach that may reduce reliance on pesticides for the production of high-quality peaches in the Southeast**

Juan Carlos Melgar, Clemson University

**Frequency of known and possible new viruses infecting wheat in Oklahoma**

Ali Akhtar, University of Tulsa

**IPM research-based recommendations for viral mosaic disease in turfgrass**

Philip F. Harmon, University of Florida

**Survey of pest populations and management practices in rain gardens**

Helen Kraus, North Carolina State University

**Evaluation of extremely low-frequency magnetic field as an IPM tool for spotted wing drosophila**

Ashfaq Sial, University of Georgia



Tawny crazy ants

**Photo credit:** Danny McDonald

# Develop Signature Programs

In 2015, the Evaluation Specialist started a review of the SIPMC IPM Enhancement program, with a focus group of the most direct key stakeholders. Several improvements have been recommended and will be implemented in 2015 and 2016.

**Facilitation of Innovation Through Technology – FITT:** FITT provides complimentary database, communications, and related IT support for working groups and other collaborative efforts.

Use of FITT resources has been directed toward specific use cases identified through our network of collaborators including SERA003 and individual Project Directors.

We are providing a web presence to three working groups to highlight particular pests. The materials posted are similar in purpose: basic biology, current distribution, pest reporting, control recommendations, highlights of research, current news, images and video for identification and presentation materials for educators to use. Of the three “websites,” only one is an independent site ([kudzubug.org](http://kudzubug.org)). Sites for crapemyrtle bark scale and spotted wing drosophila are part of the Early Detection and Distribution Mapping System (EDDMapS).

FITT has also provided mapping of county level pest occurrence via EDDMapS. Some custom maps have been developed to directly meet the needs of extension and research personnel. Fungicide resistance mapping is now available for *Botrytis cinerea*. For spotted wing drosophila, FITT is working with researchers at the University of Kentucky on a new map that could help remove confusion that comes with different start times for field seasons. The map sets the color for the county based on the number of times that a monitoring site has found adults.

Pest reporting can be done through the Southeast Early Detection Network website and smartphone apps. The tools allow anyone to report seeing specific pests and have that observation forwarded to someone for verification. Pest reporting is also available on [kudzubug.org](http://kudzubug.org) and the crapemyrtle bark scale website.

Apps are currently being developed for school and structural IPM as well as ticks, utilizing existing material.

**Cotton IPM Decision Support System (CIDSS):** This project has the potential to deliver the promise that IPM has always aspired to: effective science based management based on truly comprehensive and timely information by development of a regional decision support tool for stink bug pests of cotton (completed in year 1), other cotton pests (anticipated in years 2 and 3) and pests of other crops (anticipated in year 4).

The working group had a meeting and demonstration of the Georgia-centric app at the annual meeting of the Southeast Row Crop Entomologists Working Group on February 9, 2015. Stakeholders from Virginia, North Carolina, South Carolina, Georgia and Alabama were in attendance. All parties agree that the core functionality can be maintained throughout the region and that there is a need for specific modifications based on local conditions.

**Promoting IPM Practices to Protect Pollinators Working Group:** This group has been formed specifically to address the pollinator issue from a Southern Region perspective. Much of the first year was spent talking with interested and engaged stakeholders from all across the South to identify both potential work group members and to narrow the focus of the group. Members of the working group were identified and/or self-selected, and one impromptu meeting took place at the IPM Symposium in March, 2015. To date, the group has produced a white paper that will be used to guide the group’s activities in the future.



Fungicide resistance map (EDDMapS)

# Communicate Success: 2014 Projects

## Development of an avocado IPM website to improve adoption of IPM practices in Florida avocado

**PDs:** Daniel Carillo and Jorge Peña, University of Florida

Until recently, the complex of mite and insect pests that affected avocado in south Florida was under a 20 year old IPM program. The recent invasion of the redbay ambrosia



Ambrosia beetle adults

beetle (*Xyleborus glabratus*) has changed insect management. The beetle vectors a pathogen that causes laurel wilt, a disease that has already killed 9,500 avocado trees. The current massive applications of insecticides against disease vectors has

the potential to disrupt the current status of secondary pests by eliminating their natural enemies.

To help avocado growers and homeowners combat the redbay ambrosia beetle and other avocado pests, Drs. Carillo and Peña built the AVOCACO IPM website (<http://trec.ifas.ufl.edu/tropical-entomology/index.php>). The website summarizes 30 years of research on avocado pests and presents updated management recommendations for the new pest problems that affect the crop. The website was launched in August 2015.

### Impacts Reported:

In the three weeks since the website launched, it has received 1,342 visits, many of which could be attributed to users searching for information regarding pest management in avocado, the most important fruit crop in TREC's area of influence. The website promotes adoption of cultural and biological control tactics to control laurel wilt vectors without disrupting the IPM strategy traditionally used against other avocado pests. The AVOCADO IPM website is already promoting changes in how the south Florida's avocado grower community deals with pests. For instance, biological control tactics against vectors of laurel wilt have been recently adopted in approximately 3,100 acres of avocado in south Florida.

Because the disease is dispersing faster than expected toward the avocado producing areas of Texas and California, the website will be crucial in helping avocado growers in those states to manage the disease without the increased applications of insecticides.

## Evaluation of sanitation as an IPM tool for SWD control in blueberry

**PDs:** Glen Rains and Ashfaq Sial, University of Georgia

Georgia is among the top three blueberry producing states in the US, with an annual farm gate value of \$250 million and economic impact of \$1 billion on the state economy. Since its first introduction in Georgia in 2010, SWD infestations have led to 15-20% loss of blueberry crop annually. SWD management in blueberries is currently achieved primarily through regularly scheduled insecticide applications, a tactic which comes with several limitations and risks.



Back of tractor with roller  
**Credit:** Glen Rains

A potential method for more sustainable control lays in the reproductive biology of SWD: the insect is attracted primarily to fallen fruit, and develops as a larvae in fruit whose skin remains intact. Therefore, Rains and Sial developed a method and apparatus to 1) blow fallen fruit from the rows to the space between the rows using a tractor-mounted blower and 2) immediately crush it with a roller pulled behind the tractor.

### Impacts Reported:

Because of the intensity of insecticide spraying in other parts of the research site, the overall population of SWD on Rains and Sial's plots in 2014 was insufficient to determine the comparative effectiveness of sanitation vs. spraying. However, they were able to thoroughly quantify the effectiveness of their apparatus in moving and rupturing fallen fruit. They have already started feeding back the factors they identified into improved designs and cultural methods. The presentations of their results greatly increased Georgia growers' knowledge of sanitation's role in controlling SWD, and 55% of respondents indicated they would be more likely to implement sanitation measures. Importantly, the same proportion of growers would be willing to pay between \$500 and \$2500 to implement the Rains and Sial system, even before effectiveness has been fully validated in a replicated field test. The authors are applying for a Georgia Specialty Crop grant for 2016, and are planning to test the system again in blueberry and peach.

# Communicate Success: 2014 Projects

## Genetic characterization of an emerging aphid pest of sorghum

**PD:** Raul Medina, Texas A&M AgriLife Research



Economic population of sugarcane aphid; **Credit:** M. Brewer, Texas A&M AgriLife

Typically a pest of sugarcane, growers and researchers are concerned that the sugarcane aphid, normally limited to that crop, is now infesting sorghum, at levels not previously seen even in sugarcane.

The pest spread quickly in 2013, causing estimated yield losses of 33-50% in treated fields and 100% in untreated fields. Medina hypothesized that a biotype or host-associated population pre-adapted to sorghum but rare in sugarcane may have shifted to sorghum and dramatically increased its population numbers on that crop. Genetically distinct pest populations may differ in traits relevant to their control, making genetic characterization a key element in designing effective IPM strategies. Medina sampled sugarcane aphid populations on sugarcane, sorghum, Johnson grass, Sudan grass and wild grasses in Texas, Oklahoma, Louisiana, Mississippi and Florida to determine the genetic diversity of this pest, identify potential sources of the aggressive biotype that has invaded sorghum, and possibly explain its recent emergence as a pest of sorghum.

Genetically distinct pest populations may differ in traits relevant to their control, making genetic characterization a key element in designing effective IPM strategies. Medina sampled sugarcane aphid populations on sugarcane, sorghum, Johnson grass, Sudan grass and wild grasses in Texas, Oklahoma, Louisiana, Mississippi and Florida to determine the genetic diversity of this pest, identify potential sources of the aggressive biotype that has invaded sorghum, and possibly explain its recent emergence as a pest of sorghum.

### Impacts Reported:

After extracting DNA from 20 individuals per host plant from each of the five states studied, Medina successfully characterized the genetic population structure of the sugarcane aphid in different US states on sorghum, Johnson grass, and sugarcane. Results indicate that most of the sugarcane aphids collected belong to one genetic lineage, that the sugarcane aphid found in sorghum in the US is part of a superclone, and that the sugarcane aphids attacking sorghum in the US are likely the product of a recent host shift.

Using preliminary data from this SIPMC-funded project, Medina has secured funding from the Texas Sorghum Growers Association to explore the microbiome of the sugarcane aphid in the US. Genetic characterization of this sugarcane aphid will provide information that will be useful to plant breeders screening for sorghum resistance against this aphid. Information from this project will also help tailor the deployment of resistant varieties and pest control measures to the specific pest genotype(s) present at specific locations.

## IPM program for the new bacterial disease on watermelon in Florida caused by *Pseudomonas syringae*

**PD:** Mathews Paret et al., University of Florida

In the spring of 2013, a new bacterial disease of watermelon was reported in seven Florida counties, identified as a complex

of *Pseudomonas syringae*. The disease affected watermelon in an estimated 6,500 acres in Florida. Pure colonies of 20 bacterial strains were isolated from all watermelon samples collected from the seven counties. Among these strains 12 were highly pathogenic on watermelon and caused a disease severity greater than 60% on seedlings. Florida is the largest producer of watermelon in the United States with 24,000 acres under production and a farm value of \$138 million, and the value of watermelons in area affected is \$37.4 million.

Past research and field experience have shown that applications of copper and Acibenzolar-S-methyl (ASM; Actigard®) are both effective solutions in IPM control programs of other bacterial diseases in watermelon, as well as combinations of copper and ethylene bis thiocarbamate (Mancozeb®). In order to rapidly develop an IPM program for this emergent disease, Paret and his team initiated field trials of copper, Actigard, and Mancozeb at two locations in Florida.

### Impacts Reported:

Research trials revealed that Actigard significantly reduced disease severity and could even increase yield. Successful production and management of *Pseudomonas syringae* also relied on the use of clean transplants. The 2014 trials revealed that copper plus Mancozeb or copper on its own were the best treatment and significantly reduced the disease. *Bacillus subtilis*, a biocontrol agent, also significantly reduced disease severity. Growers are using cleaner transplants with a combined program of copper and Mancozeb with SAR inducers (such as Actigard) and *Bacillus* to maximize efficacy in disease management.

## Managing target spot, caused by *Corynespora cassicola*, in cotton

**PD:** Austin Hagan, Auburn University

The farm gate value of cotton in the U.S. was nearly \$7 billion in 2011. The geographical range of cotton is predominantly in the South, so losses have a significant impact on the region's economy. Target spot, caused by the fungus *Corynespora cassicola*, is a foliar disease that emerged in Georgia in 2011 after being dormant since 1961 and caused 70 percent defoliation with 200 lb lint/acre losses in two years. Since then, the disease has appeared across the southeast, mid-south and mid-Atlantic cotton production regions. Target spot incidence on soybean has also intensified in the southeast U.S. in recent years. Recent Alabama studies noted losses of 20% for a susceptible as compared to 5% for a tolerant variety. In 2013, farm gate revenue losses due to target spot in Alabama, Florida, and Georgia ranged from \$50 to \$80 million. Presently, control options are limited due to the lack of information on fungicide efficacy as impacted by application timing, number, and placement along with planting date, plant populations, and variety reaction on boll retention and yield. A better quantification of the role of

# Communicate Success: 2014 Projects

those factors is the first requisite to developing an IPM plan for management of target spot.

## Impacts Reported:

Unfortunately for this study, the combination of weather conditions unfavorable to target spot development, and greater use of tolerant varieties prompted by Extension previous outreach resulted in greatly reduced yield loss in 2014. However, Hagan was able to use the plots to put in place a target spot information-sharing network. Topics including identification of symptoms, management inputs that influence disease severity, and the need and possible impacts of fungicide inputs on crop yield and quality were presented at local, regional, state, and national meetings to cotton growers, crop consultants, and other agribusiness personnel, as well as extension and research personnel from Alabama, Georgia, and neighboring states.

According to a survey of growers, 44% scouted for target spot and all of those individuals made at least one fungicide application to approximately 78% of their cotton acreage. Headline 2.09SC, Twinline, and Quadris 2.08SC were used in equal proportions. All of the growers that applied a fungicide saw a noticeable yield gain. A potash deficiency was also noted by 44% of cotton producers surveyed.

The expected medium-term programmatic impact is an increased emphasis on scouting for disease and response with fungicide inputs in at-risk situations when losses are most likely to occur rather than blanket preventative fungicide treatments.

## Tools and tactics to enhance IPM adoption by small vegetable market growers and home horticulturists

**PDs:** Kris Braman, Bob Westerfield and Elizabeth Little, University of Georgia

Local food and direct marketing opportunities, including farmers markets, are one of the fastest growing segments of agriculture. According to the latest Census of Agriculture, direct sales of food products from farmers to individual consumers rose by nearly 50% between 2002 and 2007. Retail sales for locally sourced products were an estimated \$6.1 billion in 2012.

Home gardeners, growers and educators have requested information delivered through compact, attractive and portable formats that put the most highly relevant management information within immediate reach. Braman and her colleagues developed, published and distributed two guides, conducted a series of workshops, and produced an accompanying video.

## Outputs and Impacts Reported:

Braman and her colleagues produced two regional guides, one on beneficials that contribute to a healthy garden/farm, and the other on vegetable production problems. The team printed 3,000 guides and distributed them in Georgia, Tennessee and Alabama. All have been claimed in Alabama and Georgia, and few are left in Tennessee. The team developed and conducted

10 workshops statewide in Georgia, which attracted a total of 500 program participants. The interdisciplinary, hands-on training sessions received strong positive evaluations and introduced basic and advanced topics. Program participants learned how to best manage insect, disease and cultural problems on their farms and gardens, variety selection, equipment, marketing, and other business aspects. The video on IPM for vegetable growers is available on YouTube and has been viewed 569 times.

Participants expressed intentions to use these easily carried, attractive and well-designed IPM implementation guides. Participants also expressed increased confidence in identifying diseases, beneficial vs. harmful insects and a willingness to try conservation methods including trap cropping.

## Texas turfgrass crop profile and pest management strategic plan (PMSP)

**PD:** Casey Reynolds, Texas A&M AgriLife University

With the crop profile and PMSP, Dr. Reynolds now provides turfgrass managers with a single source of IPM information for turfgrass. The PDs determined the total economic output of the Texas turfgrass production industry to be \$263 million annually. The Texas turfgrass production industry supports 2,128 jobs annually, and production occurs in at least 35 Texas counties.

## Outputs Reported:

The PMSP identified key weed, insect, and disease pests of Texas turfgrasses and set priorities for the first time for Texas turfgrass.

## Update to Selected North Carolina Crop Profiles

**PD:** Barbara Fair, NC State University

North Carolina State University researcher Dr. Barbara Fair and other North Carolina experts updated 11 crop profiles of both edible and non-edible crops to provide up-to-date information on pests and a variety of management options.

## Outputs Reported:

Eleven crop profiles for North Carolina were updated:

- Christmas trees (Piedmont/Coastal Plain)
- Landscape Installation and maintenance
- Irish potatoes
- Strawberries
- Soybeans
- Ornamental plants
- Peanuts, Sweet Potato
- Tobacco
- Turfgrass
- Watermelon



# Communicate Success: Featured Projects

## Project Spotlight: Prototype generation of a smartphone app that will bring critical IPM information at the fingertips of producers, agents and specialists

PD: Guido Schnabel, Clemson University

Strawberry growers have a direct line to help for and information about diseases with the new MyIPM app, developed by researchers at Clemson University.

The idea for the app grew out of a previous series of Southern Regional IPM grant-funded projects that provided peach and strawberry growers with monitoring tools for fungicide-resistant plant pathogens. The online tool for strawberries gave growers alternatives for managing fungicide-resistant *Botrytis*. Subsequent surveys showed that the program saved growers about 10 percent of their yield.

However, *Botrytis* is not the only pest management issue that strawberry growers face, so Clemson University plant pathologist Guido Schnabel set out to give growers a “one-stop shopping” place where they could access all of the resources they might need for disease management. Beginning with strawberries and their diseases, Schnabel intended MyIPM to contain disease information for a variety of fruit crops. In fact, with the help of other experts, he was able to add peach diseases to the app before it was released to the public.



Released in early January 2015, the MyIPM app features about a dozen of the most important diseases of strawberries and peaches. For each disease there are pictures of signs and symptoms, descriptions of the causal agent and a 2-minute audio presentation from the regional specialist. Both conventional and organic growers can access chemical and biological control options. The app provides

a color-coded key to help separate active ingredients belonging to different classes of fungicides and to help growers navigate resistance issues.

“Growers will be able to pick effective and safe fungicides for conventional and organic production of strawberry,” Schnabel told *Southeast Farm Press* editors in January. “The app will in a nutshell tell you with audio, pictures, interactive tables, and text what you need to know about a particular disease and its management. I think it is an awesome supplement to our spray guide.”

Since January, MyIPM has been downloaded 505 times by Android users and 285 times by iOS users inside and outside the U.S., including in Spain and the United Kingdom.

Although only a few users have rated the app, ratings have been very positive so far, averaging 4.25 out of 5 stars.

Schnabel is now being encouraged by specialists to begin adding more fruit crops and more IPM issues, including arthropods, so he will soon be heading toward phase 2 of the long-term project.



# Communicate Success: Featured Projects

## Project Spotlight: Experiential Nursery IPM Workshop Series to Enhance Grower Adoption and Extension Agent Facilitation

**PDs: Anthony LeBude, et al., North Carolina State University**



LeBude shows workshop participants how to measure soil properties

Some hands-on workshops in June 2014 gave nursery growers a “feel” for practicing IPM.

Traditionally IPM education for the nursery industry has consisted of research talks at winter trade shows with little to no interaction between the speakers and growers. Extension agents have presented IPM trainings through webinars, making

learning more convenient to growers, but growers still don’t get an opportunity to practice the tactics as they are being taught. With a zero pest tolerance level, many growers often choose to treat their crop before knowing whether a pest or disease is present, and continue treating on a schedule. They are hesitant to take a chance on a new method that might not have the same result.

So after asking growers about their current pest management practices, NCSU Extension specialist Anthony LeBude and the rest of the Southern Nursery IPM (SNIPM) Working Group developed a hands-on IPM workshop with growers in mind. Working group members presented three two-day workshops in nursery-rich areas in Florida, Tennessee and North Carolina in June 2014, containing activities that growers could do on site.

Having the workshop in June made the content much more timely for growers than the traditional Winter talks. Because of the hands-on nature, the group limited the workshops to 35 participants each. Lectures and activities included identification, calculation of soil properties, irrigation assessments and scouting walks. Topics for

lectures included insect pests, diseases, weeds and the use of new technology, untypical for a traditional workshop. Although growers tend to avoid attending trainings during the growing season, all three workshops quickly filled up.

Based on surveys taken after the workshop, over 80 percent of participants indicated that they intended to scout for pests, diseases and weeds; rotate pesticides, fungicides and herbicides; and revise their current management plans to include techniques learned at the workshops. Follow up surveys indicated that 60 percent of growers who responded incorporated the recommended disease management practices in their operation. More than 80 percent set time aside for scouting, 90 percent incorporated sanitation practices into their daily routines, and 70 percent revised their irrigation practices. Respondents also indicated that more than 80 percent of them had trained their employees about the concepts they had learned.

Growers estimated the combined economic value of knowledge, skills and abilities learned at the workshops at a value of about \$5,000. Based on 15 respondents, that equals approximately \$50,000 of impact excluding the cost of the workshop.



Workshop participants learn how to identify weeds.



# Communicate Success: Featured Projects

## Project Spotlight: Initiation of an integrated regional response to an invasive aphid pest of sorghum

**PDs: Michael Brewer, David Kerns, Michael O. Way, Raul Villanueva, Robert Bowling and James Woolley, Texas A&M AgriLife Research and Extension, and LSU AgCenter**

In July 2013 the sugarcane aphid, or *Melanaphis sacchari* (Zehntner) was reported on sorghum in Texas. By the end of November the pest had spread through Texas and into Oklahoma, Louisiana and Mississippi. In addition to decreasing sorghum yields, the aphid produces a sticky resin called honeydew that causes the grains to stick to the plant, clogs up harvesting equipment, and attracts other insects and fungi. The pest has infested between



Sugarcane aphid colony on sorghum leaf  
**Credit:** Mo Way, Texas A&M AgriLife

25 and 50 percent of fields in South Texas. Losses in South Texas range from \$5.6 million to \$62.5 million per year.

Sugarcane aphid overwinters in remnant sorghum in harvested fields and johnsongrass. With no threshold

or monitoring protocols, growers have been forced to use pesticides preventatively, before knowing whether aphid populations are reaching a problematic level. More recently scientists have discovered natural enemies and parasitoids.

By conducting intensive sampling of sugarcane aphid populations through the southern Texas and Louisiana region, Brewer and his team were able to establish monitoring recommendations and action thresholds that would allow growers to manage the aphid while maintaining predator populations. An experiment that compared the effectiveness of insecticide sprays on susceptible and resistant sorghum crops helped develop a threshold of 50 to 125 aphids per leaf, pre-head emergence. When growers sprayed when aphid counts were at threshold, they were able to reduce aphid populations to manageable levels, while only slightly reducing predator populations.

Monitoring efforts as a result of the new protocols showed that aphids had spread farther north than expected, into the Great Plains to southern Kansas.



Sugarcane aphid winged adult, non-winged adults and nymphs on sorghum leaf  
**Credit:** Pat Porter, Texas A&M AgriLife

Research and outreach activities from the project resulted in the effective control of the sugarcane aphid over about 400,000 acres of sorghum, at a benefit of \$25 to \$50 million for 2014. Savings were at least doubled, based on prevented losses.



Sugarcane aphid, natural enemies (syrphid fly and lady beetle adults), and sooty mold on sorghum leaf  
**Credit:** T. Ahrens, Del Mar College

# Friends of IPM Awards

Directors of the Southern IPM Center once again presented two students and six IPM professionals with Friends of Southern IPM Awards this year.



Julian Golec

Masters student **Julian Golec** from Auburn University and Adam Dale, a doctoral student from NC State University will receive the student awards. Golec, who is graduating this year, discovered two important parasitoids that attack kudzu bug. Both the tachinid fly and wasp parasitoid are native to Alabama and could provide a sustainable biological control for kudzu bug. After the initial discovery, Golec did further research to document that the parasitoid would work effectively. In addition, he has authored refereed publications and presented during conferences and workshops. Golec's award was presented in absentia during the Southeastern Branch ESA conference in March.



Adam Dale

**Adam Dale**, a Ph.D. student at NC State University also finishing his studies this year, has a focus in urban ecology. During the past couple of years, he has been studying how urban warming affects populations of gloomy scale on street trees. Dale began working on IPM in street trees during his masters program. One of his recent studies showed that street trees surrounded by impervious surfaces tend to show signs of drought stress more than trees in cooler areas. In addition, gloomy scale populations were more numerous on the stressed trees, as female scales tended to reproduce more as temperatures increased. His results were published in an article in PLoS One. Dale will receive his award at the Ornamental and Turf Pest Management Symposium at the national ESA conference in November.

The **Social Media Team for the University of Tennessee Extension, Soil, Plant and Pest Center** won the Bright Idea award for communicating information and updates through Facebook about new insect pests and diseases.

The team's goal was to raise awareness about IPM to anyone from farmers and nursery owners to the home gardener. During the last few years they have grown an encyclopedia of information and photos about insect pests and diseases. They have logged about 95,000 unique users since the page was released, and content from their blog has been shared in Facebook posts by over 600,000 users. The team received their award at the Southeastern Branch ESA conference.



Alan Windham (L) and Frank Hale (R)

**James Jacobs**, a county Extension coordinator in Georgia, developed his own research trials and educated growers with the results, winning the IPM Implementer award. Jacobs started as a county agent in Berrien County, GA, in field crops. From there he worked with growers to transition from traditional row crops to specialty crops like strawberry and blueberry. He has collaborated with extension faculty at the University of Georgia in both insect and disease issues and always communicates results of trials to growers. Jacobs received his award at the Georgia Entomology Society meeting in April.



Henry Fadamiro, James Jacobs and Ashfaq Sial

# Friends of IPM Awards

University of Tennessee Extension specialist **Frank Hale** is not only part of two groups winning awards this year (the Social Media Team and the Thousand Cankers Disease Team), but he will receive an award on his own: the IPM



Henry Fadamiro and Frank Hale

Educator Award. With a 100% extension appointment, Hale is able to focus on educating extension agents and growers, but he has gone beyond the scope of his position to collaborate on research and teach students as well. One of his greatest impacts is in providing educational materials for a diverse audience,

from fact sheets and books to apps. He is also active in collaborations that involve invasive species and regulatory issues. Hale received his award at the Southeastern Branch ESA conference.

The **Thousand Cankers Disease (TCD) Team** at the University of Tennessee will receive this year's Pulling Together award. This group, which consists of entomologists and plant pathologists from the University of Tennessee, sprung into action immediately after the disease was discovered in the state, initiating research



**In corners:** Frank Hale (L) and Alan Windham (R) **Included in group:** Jerome Grant, Paris Lambdin, Mark Windham, Greg Wiggins, and Denita Hadziabdic

and outreach efforts to spread word about the threat. Thousand Cankers Disease kills black walnuts, a highly valued tree for its fruit and wood, and the rate of its spread could mean extinction for black walnut if not quickly mediated. Since the problem was identified, the group has

raised more than one million dollars from public and private sources. Outreach efforts to agencies and the general public resulted in less wood movement and enforced quarantines. The group received their award at the Southeastern Branch ESA conference.

**Heather Kelly** from the University of Tennessee is this year's Future Leader. A plant pathologist who joined the University of Tennessee just two and a half years ago, Kelly has worked with other scientists on field crops to ensure that growers use the best IPM practices to protect their crops from disease. She compares the use of various technologies and practices in different environments, and conducts variety and fungicide trials to be able to recommend the most effective combination of planting and control.

A hobbyist beekeeper, she is interested in the effects of fungicides on pollinators, so she is working with Dr. Scott Stewart and apiculturists on pollinator protection. Dr. Kelly received her award during the Southern Soybean Disease Working Group meeting in March.



Heather Kelly and Henry Fadamiro

This year's Lifetime Achievement award goes to **Ron Smith** at Auburn University. An Emeritus Professor who retired from his paid job in 2003, Smith has devoted, and continues to devote, his life to helping crop consultants and farmers use IPM to have the most successful crop at the lowest economic risk. He began his career during the era when DDT was the primary method of control for insects on cotton and was able to transition to new ways of thinking as new classes of insecticides and new recommendations replaced the old control methods. According to those who worked with him, he was the primary reason for the success of the Boll weevil Eradication Program in Alabama, because growers trusted his advice. He was one of the first entomologists to recommend controlling for stinkbugs after the boll weevil was eliminated, and consultants and growers who listened to his advice—some at the ridicule of their neighbors—discovered the worth of his research. To this day he continues to assist cotton growers and is credited with ushering growers from the era of old cotton IPM to the new cotton IPM. Dr. Smith's award was presented in absentia during the Southeastern Branch ESA conference.



Ron Smith



**Front cover photo:**

Vineyard at Biltmore Estate

Credit: Bridget Lassiter, NCSU

**Back cover photo:**

Pepper field at University of Kentucky

Credit: Joe LaForest, SIPMC and Bugwood Network