



2014 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 are supported by a grant from USDA's National Institute of Food and Agriculture.

Staff:

Jim VanKirk, Director
(919) 513-8179
jim@sipmc.org

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

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

Danesha Seth Carley, Associate Director
919-513-8189
danesha_carley@ncsu.edu

Doris Sande, Impact Evaluation Specialist
919-515-3207
dsande@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

From the Directors' Office	4
About this Report.....	5
Objective 1: Network with Stakeholders:	6
Objective 2: Build Partnerships	8
Objective 3: Develop Signature Programs.	10
Objective 4: Evaluate & Communicate Successes.....	11
Impacts of 2013 Projects	12
Featured Projects	17
Friends of IPM Awards	20
Looking Ahead	23

From the Directors' Office

An update is available: Install Version 6: Southern IPM Center

SIPMC is entering its sixth iteration since inception back in 2000, and I'm excited about the approaches we're taking to develop and facilitate implementation of IPM. Some are brand new, some have been around awhile, and some have a mix of new adjustments to existing projects.

The **IPM Enhancement Grants** program will look much the same as it has in the past. We will continue using relatively small seed, capstone and working group grants to leverage and synergize with other resources, helping to produce environmental, economic and health benefits.

It's amazing how far a little bit of technical support and advice can go to facilitate an enhance working groups, research projects, and other IPM efforts. Our **FITT (Facilitation of Innovation Through Technology)** program has been very successful since its inception a couple of years ago and I look forward to more of the same.

We have tinkered a little with the **Regulatory Information Network**, but it will remain a key component to facilitate communications and understanding between – in both directions – regulatory agencies like EPA and USDA's IR4 program and like farmers and crop advisors who use IPM in the field. Similarly, the **Friends of Southern IPM Awards** program, with minor adjustments, will continue to recognize, promote and support the achievement of both individuals and groups working in IPM.

For years SIPMC has provided IT and database support to the national system – other IPM Centers as well as USDA. By the time you read this the new national IPM website design will be in place (www.ipm.gov and www.ipmcenters.org) and a lot of "behind the scenes" work will also be completed. You can read a little more about this work on page 23.

We are moving into some entirely new ventures. The **IPM eAcademy** will be a series of online presentations – think of TED talks, focused on IPM-related issues. The **Southern IPM Roundtable** will be a 3-day regional conference, a sort of regional IPM Symposium, held in "off" years (2016 and 2017) of the International IPM Symposium. A regional **IPM for Pollinator Protection Work Group** will help focus and facilitate research and extension efforts to manage Colony Collapse Disorder and related issues adversely affecting honey bees and other plant pollinators. University of Georgia has developed a smartphone app called *GA Cotton Insect Advisor* to aid Georgia cotton growers with stink bug management decisions. Our new **Cotton IPM Decision Support System (CIDSS)** will expand that app first to apply to other states, then to apply to other cotton pests, and finally to address IPM decisions for other crops.

Finally, the staff. A couple of years ago we recruited new partners to help lead the Center, and I could not be happier with that decision. Associate Director Henry Fadamiro of Auburn University, Co-Director Joe LaForest of University of Georgia and Associate Director Danesha Seth-Carley of NC State bring expertise, commitment, ideas and enthusiasm. Together with the rest of us (also a mix of veterans and newbies) – Rosemary, Luz, Alex, Robin, Kim, Doris, Clarissa – we have a capable and committed group that gets the job done and more. If you don't already know or haven't already worked with us, I hope you get the chance soon – it's a great group.



Jim VanKirk



Joe LaForest



Henry Fadamiro



Danesha Seth Carley

James R. VanKirk

About this Report

This annual report is a compilation of the activities of the Southern IPM Center for the 2013-14 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 2013-14, the Center worked to fulfill five 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. Support evaluation efforts to document the impacts of IPM implementation throughout the region and communicate outcomes to stakeholders, funders and policymakers.

Objective 5: Manage funding resources effectively.

Network with Stakeholders

Although everything we do essentially counts as stakeholder networking, SIPMC has two special groups that we rely on to give us feedback about stakeholder needs and to return messages about Center activities to the community. These two groups are part of the IPM Center and shape policy and planning decisions.

Our true stakeholder network, however, extends beyond the groups represented by the Advisory Council and includes farmers, ranchers, foresters, school staff, parents and children.

Regulatory Information Network

The EPA initiated a program called 'registration review' to reevaluate all pesticides on a regular cycle. The program's goal is to review the active ingredient of each pesticide every 15 years to make sure that as the ability to assess risks to human health and the environment evolves and as policies and practices change, all pesticide products in the marketplace can still be used safely.

Through the pesticide reevaluation program, EPA periodically reviews individual registered pesticides to ensure that they continue to meet statutory standards and can be used without unreasonable risks to human health and the environment.

The Role of the Regulatory Information Network

The primary responsibility of the Network is to respond to pesticide registration-related inquiries from the EPA and USDA OPMP. The RIN has 5 important collaborators: The Regulatory Information Network Coordinator (RINC), Danesha Seth Carley, and the 4 regional leaders: Mike Weaver, Darrell Hensley, Mark Matocha, and Mark Mossler. These 4 gentlemen serve as program liaisons with key state and university stakeholders. As a whole, this network provides important value at the state and local levels.

The primary responsibility of the RINC is to organize monthly teleconferences, coordinate responses to agency queries, coordinate Crop Profile updates, maintain and update the expertise database and to redesign, repopulate, and maintain the national Crop Profiles database.

Changes in science, public policy, and pesticide use practices will occur over time. The registration review program challenges EPA to continuously improve its processes, science, and information management while maintaining a collaborative and open process for decision-making. The RIN is a critical partner in helping to inform EPA decision-makers about these changes in science, practices, and pesticide use.

Advisory Council and Steering Committee

SIPMC revitalized and revamped its Advisory Council this past year, both in membership and in communication. Membership broadened to include the following groups:

- IPM-related regional technical committees such as:
 - a. SERA003 (IPM);
 - b. SERA025 (turf);
- Grower associations and other groups engaged in implementing IPM. These include:
 - a. National Cotton Council
 - b. National Alliance of Independent Crop Consultants
 - c. Certified Crop Advisors
 - d. Cotton, Inc.
 - e. Food production
- IPM issues-focused efforts including but not limited to:
 - a. Center-sponsored Working Groups
 - b. ipmPIPEs in this region
 - c. eXtension Communities of Practice
- Public sector partner organizations including:
 - a. Southern Plant Diagnostic Network (SPDN)
 - b. EPA regional offices (Regions 3, 4 and 6)
 - c. Southern SARE
 - d. IR-4
 - e. USDA PSEP coordinators
 - f. 1890s universities
 - g. Insecticide Resistance Action Committee (IRAC)
- Environmental and public interest groups such as:
 - a. Southeast Exotic Pest Plant Council (SE-EPPC)
 - b. Southern Forest Insect Work Conference (SFIWC)
 - c. Watershed Protection, City of Austin
- Steering Committee members

Rather than holding a semi-annual meeting as we had in the past, we engaged the group in web meetings and online discussions through Basecamp, in addition to one annual face-to-face meeting.

This past year's meeting took place in Atlanta in February. Brainstorming activities about stakeholder needs translated into two new "signature programs" for the 2014 Regional IPM Center proposal: requests for periodic informational webinars became an "eAcademy," and suggestions for presentations from project directors became the Southern IPM Roundtable. A request for more frequent communication and an e-mailed newsletter has already come to fruition with a MailChimp newsletter that collects titles and captions from our blogs and sends out feature stories once a month and news, funding and employment items once a week.

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, however, 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.

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. Last year the group decided to embark on more outreach to small farmers with a low input guide to be finished at the end of this year. In addition, the group adopted a definition of “small farms” more specific than USDA’s definition and selected leadership for the group and will be independently applying for funding in 2014.



Joe LaForest, University of Georgia

Small Farms Working Group, 2014 meeting

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. In 2012 the group collaborated on a massive, 300-page e-book on deciduous tree production. As of January of this year, the book had been downloaded by 388 separate users. Based on user evaluations, each download led to increased savings or earnings by an average of \$3,313 because of reduced pesticide use or more refined pesticide applications, or a total savings of \$1,285,444 in 2013.

A mobile app called IPMPro, also developed in 2012, received the same positive feedback. The first of its kind for the green industry, IPMPro uses text notifications to alert growers when key insects, mites and diseases of woody plants are emerging, encouraging the grower to begin scouting. Reminders for scouting and plant care have saved users an average of \$3,367 per user, resulting in a total impact of \$1,356,901 based on 403 downloads.

eFly

The Spotted Wing Drosophila Working Group, or eFly, began as a regional meeting funded by a 2012 SIPMC Critical Issues grant. After developing a list of priorities for spotted wing drosophila, the group applied for a 2013 IPM Enhancement Grant to revise the priorities and conduct a national impact assessment. Both are currently available at the group’s website, located at <http://swd.ces.ncsu.edu>.

Until eFly had surveyed SWD impact in the eastern U.S., there was no collective assessment of the pest's impact to eastern crops. In addition, the collaboration of research and extension experts from New York to Florida increases coordination of efforts to reduce duplication. Working group leader Hannah Burrack named the effort "a united front" against spotted wing drosophila.

School IPM

Co-chairs Fudd Graham (Auburn University) and Janet Hurley (Texas A&M AgriLife) lead a quarterly teleconference of this working group to share and exchange ideas regarding school IPM and urban pest issues. Graham and Hurley are also leaders for the eXtension Urban Community of Practice. Utilizing the face-to-face meeting capacity of the Urban IPM CoP this workgroup has developed pest management action plans, a YouTube Channel for school IPM related videos and collaborated with the Fire Ant CoP to participate in monthly webinars. While this group does not meet physically or virtually every month, they are in constant contact using email or the workgroup listserv. The co-chairs participate each month on the National School IPM Steering committee calls and have utilized the relationships formed by this workgroup to submit grants or collaborate on special projects. In 2013, NCSU and TAMU collaborated with Syngenta to develop a color brochure "An Ounce of Prevention – Integrated Pest Management for Schools and Child Care Facilities," which has been adopted by several states across the country as a marketing and educational tool for introducing IPM to interested stakeholders.

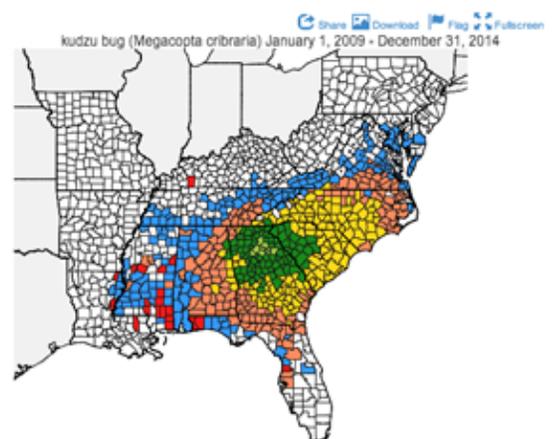
Facilitating Innovation Through Technology (FITT)

Led by Joseph LaForest at the University of Georgia, this project provides communication tools for working group members to use as platforms to give them more communication options, develops common databases for exchange of information, and provides new content delivery/data visualization options for occurrence records and trapping data of certain species.

This year FITT assisted with launch of a new Virginia Ag Pest and Crop Advisory system. The new system maintains the existing functionality of timely e-mail updates to subscribers, and introduces improved support for embedding dynamic content such as maps, tracking of user interaction, the electronic newsletter and website, and improved support for including images with posted news items. The new system uses WordPress for managing the content provided by the extension specialists and MailChimp to automatically generate newsletters, deliver them to subscribers, and document their interaction with the information. In addition to the system in Virginia, IPM programs in Tennessee, Georgia, and North Carolina are planning to use similar setups of MailChimp and Wordpress for information delivery and have agreed to share the usage data to get a broader view of IPM information dissemination.

Enabling wider sharing of information in real-time is still a main focus of the FITT program. In that spirit, we've added new features to the pest distribution maps: Social sharing options and oEmbed. Social sharing options are a set of buttons available on top of any map provided by FITT. The "share" button, for instance, will pull up icons for social media sites such as Facebook, Twitter, Google+ etc. so users can share with followers (see graphic on right). It also includes the embed links for users wanting the content on their own sites. Wordpress users can use oEmbed to share content. For instance, if a user wants to display a map on a Wordpress page, he or she needs only to paste the URL of the map in the body of the post. When visitors to the website look at the page, they will see the map rather than the URL.

DISTRIBUTION MAP



Kudzu bug distribution map

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.

IPM Enhancement Grants Program (IPMEP): Our internal grants program is a foundational mechanism we use to address important issues affecting the region that 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. Detailed reports from funded projects are presented starting on page 12.

Facilitation of Innovation Through Technology – FITT: The FITT initiative facilitates use of the most appropriate and current technology by IPM programs and projects and ensure that existing resources are fully leveraged. FITT serves a valuable role for our partner programs in monitoring the technology environment, identifying tools that will be useful, bringing these tools to the attention of our IPM stakeholders, and facilitating their use. FITT provides database, communications, and related IT support for working groups and other collaborative efforts such as those funded by our Critical and Emerging Issues and IPMEP grant programs.

Cotton IPM Decision Support System (CIDSS): CIDSS builds on a foundation developed by our University of Georgia partners and supported by Cotton, Inc. In short, an existing smartphone app to assist with management of stink bug cotton pests in Georgia will be expanded to address stink bugs in other states, then other cotton pests, then IPM for other crops.

IPM for Pollinator Protection Working Group: This project will engage Southern Region stakeholders in addressing the pollinator health and protection issue to coordinate communication, research and outreach efforts in this area. Expected outputs relate to development and implementation of pollinator-friendly practices and include prioritization of specific research and extension projects; consideration of pollinators when developing IPM recommendations; and dissemination of educational information on best practices. Future plans include development of a network of pollinator habitat gardens in several states for use as education/demonstration sites.

The Regulatory Information Network (RIN) is SIPMC's first responder for priority pest management challenges related to impacts resulting from regulatory actions. By facilitating and managing information flow among regulatory agencies and regional stakeholders, the RIN informs regulators of the practical needs of the agricultural sector, and update the agricultural sector of regulatory plans, actions, and requirements of federal regulators. We will continue to manage the RIN but it will no longer classify it as a Signature Program. More details on p. 6.

The Small Farms Working Group (SFWG) responds to IPM issues of underserved groups and focuses on small, highly diversified farms including those using low input, organic, and sustainable methods. We expect to continue facilitating this important collaboration through the SFWG although it will no longer be classified as a Signature Program. More details on p. 8.



Cotton research on cultural control of foliar blight

Credit: Bridget Lassiter, NCSU

Evaluate

In 2012 SIPMC hired an Impact Evaluation Specialist to work with IPM Enhancement Grant project directors on acquiring baseline data and specifying the impacts of the projects. The IPM Enhancement projects last only for one year and receive up to \$30,000, so most PDs have only enough time and money to do trials to apply for a larger grant or finish up a preceding grant with outreach materials or workshops.

In preparation for the RFA release, SIPMC conducted a survey of extension specialists around the region to ask what IPM topic they felt was the highest priority that year. Survey results indicated five special priorities:

1. Herbicide resistant weed pests affecting important agronomic crops
2. The insect pest *Megacopta cribraria*, known as the kudzu bug
3. Stink bug pests in agronomic crops
4. The insect pest Spotted Wing Drosophila (SWD), *Drosophila suzukii*
5. Residential IPM, including management of bed bugs, termites, fire ants and other pests as well as general IPM principles and techniques

PDs who applied under the "Special Priority" provision could be awarded extra points. Those who did not receive a Special Priority dedication could still be awarded funding under general IPM Enhancement grant funding.



Credit: Brad Fritz, NCSU

Kudzu bug on soybean

Communicate

Impacts of 2013 projects are included in the next several pages. Project successes were highlighted in our features blog, "IPM in the South," which reaches blog subscribers, Twitter followers, followers of Twitterers who retweet our tweets and subscribers to a new e-mailed newsletter that collects monthly blog topics and e-mails them out to interested readers. Projects with concrete and substantial impacts, and newsworthy material, are sent to the news media.

Impacts of 2013 Projects

A Dual Recombinant Vaccine for Brucellosis and Immunocontraception in Feral Swine

PD: Nammalwar Sriranganathan, Virginia Tech

This innovative project investigates curbing populations of feral swine while also preventing them from transmitting brucellosis. Feral swine cause \$1.5 billion each year in crop and land damage, and they harbor *Brucella suis*, the bacterium that causes brucellosis, a deadly cattle disease that can also be transmitted to humans. Dr. Sriranganathan used mice to test a newly developed vaccine that prevents infection by *B. suis* and sterilizes them reproductively. Once studies have been completed on mice, studies using captive feral hogs and wild pigs will commence to see if it has the same effect on hogs.



Credit: Wikipedia

Impacts Reported:

The vaccine has proved effective at protecting mice from *Brucella suis*. The vaccine VTRS2-mGnRHb, re-engineered from mGnRH, was absorbed in the 6-week targeted window of time. In experiments comparing reaction to *B. suis* inoculation between vaccinated and non-vaccinated mice, there was a statistically significant difference in IgG antibody response in mice receiving the vaccine versus the control mice.

Potential Impacts:

Feral swine populations have been estimated to have quadrupled in the last decade, despite current control methods of hunting and trapping. If the current VTRS2-mGnRHb proves to protect feral swine against *B. suis* and sterilize reproduction, the vaccine has the potential to be a powerful addition to the current arsenal against feral swine. If control efforts using other methods are targeted at reproductive swine, vaccinated swine may be key to preventing the rapid reproduction of current populations.

Assessing the scope of an emerging threat: the insecticide-resistant, bait-averse German cockroach

PDs: Jules Silverman and Coby Schal, North Carolina State University

Cockroach baits have been used for more than 30 years. For the last 20 years, specific populations of German cockroach (in Puerto Rico) have been showing an aversion to several commercially available baits. The PDs tested cockroach populations donated by PCOs from several areas to determine the nature of the aversion and if German cockroaches in states outside of Puerto Rico carry the aversion trait. Insect baits are comprised of a food to lure the insect to the bait and entice it to eat, along with a toxin that kills the insect some time after the insect has ingested the bait. Cockroach baits consist of a type of sugar (su-

crose, glucose or fructose) and one of three active ingredients: hydramethylnon, indoxacarb and fipronil.

Impacts Reported:

Silverman and Schal tested the cockroaches for resistance both to the active ingredients and to the stimulant sugars, using cockroaches obtained from apartments showing aversion to baits. "Bait aversion" is a term to describe an insect's avoidance of or reduced consumption of a bait, to the point where the amount of bait the insect consumes is not enough to kill it. Reduced consumption can eventually cause insecticide resistance.

Testing of several German cockroach populations proved that both bait averse and insecticide resistant cockroaches were widespread. Silverman and Schal also discovered a few populations that were both bait-averse and resistant to the active ingredient. Experiments with glucose-filled baits confirmed that bait-averse cockroaches have an aversion to glucose. Resistance to at least one of the three active ingredients in the insecticide was also common. The scientists' next step is to test aversion to the two other sugars, sucrose and fructose.

Potential Impacts:

These findings have a serious impact on the pest control industry. Given the short time of the grant, the PDs were unable to test alternatives to the current insecticides; however, the scope of their findings suggest that additional research and educational efforts are needed.

Bed Bugs and Book Bags Prevention and Education Program

PD: Rebecca Baldwin, University of Florida

Although they don't typically transmit disease, bed bugs are probably one of the most feared public health insects in the United States. In 2012, the Jacksonville Bed Bug Task Force created the Bed Bugs and Book Bags curriculum for third through fifth graders, and educators showed an overwhelming interest in the materials. Dr. Baldwin used funding for this project to complete pilot testing and evaluation of the curriculum, and to expand the curriculum to sixth through eighth grades.

Impacts Reported:

Impact on teachers was measured through train the trainer workshops. Two workshops offered in Austin Texas (fall 2013) and Jackson, Mississippi (spring 2014) together indicated a 22-point increase in teacher knowledge. Online modules were created in 2012, and out of 339 educators surveyed, 100 indicated they had participated in the online training. Fifty-



Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org

Impacts of 2013 Projects

four percent of them had used the curriculum within the last 3 years. Of these, 69% had used it 1-5 times and 7% had used it more than 15 times. Together, they reported having shared the



Bed bug
Credit: Wikipedia

curriculum with 3,777 individuals. In addition, teachers and pest control professionals outside of the southern region are sharing the curriculum with students and employees; employees have in turn given the information to schools, church and government groups, retirement homes and others.

Only 23 parent surveys were returned; however, of those, 80% reported discussing bed bug information with their children. In a separate example, a 12-year old shelter resident discovered bed bugs in the family's living quarters, and after being ignored by the parent, collected and gave photos and samples to the family social worker, who inspected the unit and found an infestation in the sofa bed. A teacher from Alaska reported that her students come from a village in Alaska where every home is infested, and these infestations have been carried to hotels in Anchorage. She suggested making Western Alaska a target of their efforts as well since many people travel between Alaska and Florida on a regular basis.

Potential Impacts:

The development of the Bed Bugs and Book Bags curriculum, plus the interest already generated nationally, has opened the door for Dr. Baldwin and her colleagues to work with the National Science Teachers Association. The team is planning a regional workshop for the fall of 2014. If the NSTA recommends the curriculum on a national level, education about bed bugs in schools and homes will be accessed by millions of elementary and middle school teachers, children and pest control professionals.

Developing spotted wing drosophila (*Drosophila suzukii*) integrated pest management program in blueberry and strawberry crops: Monitoring, management and outreach

PD: Oscar Liburd, University of Florida

Those packages of strawberries and blueberries that shoppers see in the grocery store in December and January may have come from Florida, the primary U.S. producer of winter strawberries and early-season blueberries. In 2009 Florida berry growers faced a new threat, the spotted wing drosophila, which deposits its eggs inside ripening fruit and renders it unmarketable. This project builds on previous research and extension activities with respect to management of SWD in

Florida's berry crops, including SWD surveys for blueberry and strawberry growers, management options, identification and farmer training. New surveys were conducted for SWD in strawberries, and surveys in SWD in blueberry were expanded to the southern part of Florida.

**Leveraged funds \$326,000 on \$29,895 initial investment
ROI = \$10.9 return on every dollar invested**

Impacts Reported:

About 40% of the growers involved in the survey project began to monitor for SWD as opposed to spraying every 10 days or using no control at all. SWD traps at strawberry farms indicated that SWD was present at all farms, whether or not growers had been spraying. Traps in southern Florida blueberry farms indicated that SWD was not present at many of the farms. All growers began monitoring for SWD. As a result of the monitoring, blueberry growers in southern Florida reduced their spray program by 50%, and one grower did not have to spray at all the entire growing season. Many strawberry growers began spraying for SWD for the first time after monitoring began.

In addition, PDs tested the efficacy of several conventional and reduced risk insecticides, including two labeled for organic use and one that was in the process of registration. Recommendations assisted growers in finding alternative products especially for the peak harvest season, when re-entry times must be short. Some growers switched from conventional products to the reduced risk pesticides, and one organic grower began rotating between the two available organic insecticides.

Potential impacts:

After the monitoring project and efficacy tests were complete, Liburd conducted three grower workshops. Workshops were attended by small or backyard farmers, extension personnel and others. Each of the workshops had at least 100 attendees, and half of the attendees could distinguish a male from a female SWD by the end of the workshops. The project has the potential to expand monitoring for SWD, and to save growers economically, especially for strawberries and in areas that may not be infested by SWD. Use of more reduced risk products also has the potential to decrease the health and environmental risks associated with some of the conventional insecticides.

Insecticide susceptibility and enterase activity in the redbanded stink bug

PD: Raul Medina, Texas A&M AgriLife Research

Redbanded stink bug (RBSB), *Piezodorus guildinii* (Westwood) is a relatively new pest of soybean, *Glycine max* (L.) Merr. in the southern US. Invasion by this neotropical pentatomid has been responsible for a significant increase in the amount of insecticides applied in soybean, threatening development of insecticide resistance in RBSB. This study was conducted to generate baseline data on insecticide susceptibility levels in current RBSB

Impacts of 2013 Projects

field populations. Results from both laboratory bioassay and field trials showed that RBSBs are more susceptible to neonicotinic and pyrethroid insecticides than to the organophosphate acephate, which took longer time to show RBSB mortality.

Impacts Reported:

The project generated baseline data, which provide a benchmark for the future evaluation of insecticide susceptibility of RBSB. Baseline data can be used to assess if resistance to acephate is developing. The project also included recommendations to test for acephate resistance development in RBSB populations at multiple locations. Project data suggest that the most commonly used insecticide against RBSB (acephate) may not currently be the most effective one in terms of killing power.

Potential Impacts:

Data from this work provides information to improve insecticide resistance monitoring and management strategies for RBSB. Four products, two pyrethroids and two neonicotinoids were evaluated for efficacy against RBSB, and these provide an opportunity to rotate amongst them, reducing the chance for resistance development. The information on the LD50 of insecticides other than acephate will aid in the reduction of overall insecticide applications. Reduced insecticide applications targeting RBSB will ultimately reduce the cost of production and increase producers' net income. In addition, reduced insecticide applications in soybeans will benefit natural enemies, the environment and ultimately human health.

Genetic structure of cotton stink bug parasitoids associated with different host plant species

PD: Raul Medina, Texas A&M AgriLife Research (2013 Special Priority—stink bugs)

Stink bug species are some of the primary pests of cotton, infesting millions of acres every year. Most cotton growers use chemical control against stink bugs, but the resulting eradication of natural enemies invites other pests to take the place of the stink bugs. Due to the delay in funding, the PD was unable to find parasitoids in high enough numbers to complete the objectives of the grant.

Impacts Reported:

PD plans to repeat the project next year at a more appropriate time.

Potential Impacts:

If parasitoids can reduce stink bug numbers, they may be used instead of or in connection with insecticide treatments and reduce the number of insecticide treatments.

IPM for Shrubs in Southeastern U.S. Nursery Production (Vol. 1), a SNIPM Working Group Effort

PDs: Sarah White et al., Clemson University

The Southern Nursery IPM Working Group (SNIPM) published a six chapter book, established a leadership team and guidelines for election of leaders over the coming years, and submitted 2 grant applications. The book was published in hard copy and electronically as downloadable pdf files from the SNIPM website (<http://wiki.bugwood.org/SNIPM>), and was published as an iBook in July 2014. Printed copies of the book will be given to growers, landscapers, and extension agents throughout the southeastern US.

In addition to preparing the book, the membership of SNIPM met in August 2013 at a regional grower meeting and were able to develop a governance structure for leadership to help to assure continued productivity and outputs from the group.

Leveraged funds \$39,982 on \$29,983 initial investment

ROI = \$1.33 for every dollar invested

Impacts Reported:

The shrub book was centered on disseminating information on integrated pest management practices for five shrub species in production in the southeastern US. As of June 26, 2014, the shrub book has been downloaded 22 times from the website and over 108 copies of the book have been given to nursery growers and extension agents attending 3 workshops. The group will survey attendees of these workshops in one year (June 2015), to see how they are incorporating recommendations from the shrub book. Several growers have indicated that they are using the book to choose cultivars that will lower their inputs.

Economic impact of those surveyed about use of information presented in the IPM Tree Book were collected, and recipients increased savings or earnings by an average of \$3,313 per book. Savings reported were due to reduced pesticide use and more refined pesticide scheduling and, thus, more effective pesticide applications. Over 1180 .pdf and/or iBook downloads of the IPM Tree book (from a previous grant) have occurred since its release in May 2012; 85% of these downloads occurred in the US, with the remaining 15% from 53 countries around the world.

Potential Impacts:

Information from the Shrub book has the potential to lower insecticide and fungicide inputs by increasing scouting and



Redbanded stink bug

Impacts of 2013 Projects

changing grower planting and production practices. Growers in the ornamental industry must deal with a zero tolerance policy for plant damage, typically pressuring growers to treat on a scheduled basis. Introduction of IPM techniques to the nursery industry has the potential to reduce costs and improve environmental and health risks.

Strengthening Extension leadership and stakeholder training on the *Megacopta cribraria* invasion front

PD: Xing Ping Hu, Auburn University (2013 Special Priority Project—kudzu bug)



Kudzu bug on soybean

Since its initial detection in Georgia in October 2009, the kudzu bug has become one of the most serious agricultural and residential pests of the Southeast. Researchers have made several discoveries about the biology and ecology of the pest. In this project, Dr. Hu and others in Alabama Extension trained growers and Extension personnel about the pest and how to manage it using a variety of methods, including a new parasitoid. In addition, the team developed 4 Extension publications, 4 information sheets, 6 newsletter articles, 5 refereed journal articles, 11 conference presentations, and 85 articles for the media.

Impacts Reported:

When measured during workshops, post-test scores increased by 18 percent over pre-test scores. Survey data from Cooperative Extension Agents indicated that agents typically receive from 50-100 questions per year. The goal of the project was to produce educational materials to reach Extension personnel, growers and the general public with information about kudzu bug. Altogether, the group produced 115 outreach materials, including Extension publications, information sheets, newsletter articles, journal articles, conference presentations and articles for the media. A few of her articles appeared in Southeast Farm Press, a popular agricultural magazine.

Workshops and materials focused on scouting for kudzu bug to determine the life stage of the insect. According to Hu's extension publications, the most economic use of insecticides occurs when the majority of the population is in the immature stage. Spraying too early incurs more sprays, while spraying just at the point when the insect is at threshold, and using the correct insecticides, can reduce the number of sprays per season. Hu recommended scouting and using knowledge of the insect's life stage and action threshold, once for each of the two generations of the insect.

Potential Impacts:

With the number of outreach materials disseminated, growers and the general public will have more information available to make educated choices about managing kudzu bug effectively and economically. In addition, if growers follow her recommendations for scouting and treating, they should be able to spray only twice per season instead of multiple times.

Sustainability in turfgrass systems: Assessment of new strategies for weed control and species selection

PD: Travis Gannon, NC State University

Turfgrasses are typically a monoculture that must grow aggressively to maintain density and durability under intense physical activity. This project included the first phase of a comprehensive research program to develop new integrated pest management (IPM) strategies for pest control in turfgrass systems that will minimize or eliminate the health and environmental problems posed by pesticide use. The initial focus was developing strategies that reduce synthetic pesticide inputs for weed management, one of the most difficult challenges for an effective IPM program in turfgrass systems.

The effectiveness of non-pesticide weed-control treatments were evaluated alone and compared to synthetic herbicides. The focus was on new, recently registered herbicides that have improved modes of action and very low use rates. The effect of turfgrass mowing heights was also evaluated as well as comparing native and non-native turfgrass species.

Impacts Reported:

This research has established that there are turf-like native grasses that both exclude weeds and add an attractive soil cover for areas that are traditionally covered in turfgrass. Research has demonstrated that these grasses also do well under drought and heat conditions. More research is underway to further evaluate native grasses and their potential to replace traditional turfgrass in certain settings.

Potential Impacts:

If turf-like native grasses were available to landscapers and homeowners in the Southeast, transitioning from current turfgrass species to species that require less fertilizer and water resources has the potential for both financial savings and environmental benefits.

Toward managing target spot, caused by *Corynespora cassiicola*, in cotton

PD: Austin Hagan, Auburn University

In the past three years target spot has caused widespread defoliation of cotton in Alabama, Georgia, North Carolina, South Carolina and Virginia. Because the disease is relatively new and

Impacts of 2013 Projects

until recently was localized to irrigated cotton in southwest Georgia, very little is known about the disease or its effective control. Lint decline is estimated at 5 percent for tolerant varieties, a percentage that would cost \$65 million for producers in Georgia and Alabama alone. This project examined the effects of the disease on various cotton varieties and tested the efficacy of fungicides on the disease to validate fungicide recommendations.

Research proved that target spot reduced yield but did not impact cotton fiber quality, fiber length and strength values. Using less susceptible varieties can decrease losses by 100 pounds per acre of lint. Disease intensity was found to be greater in Georgia and southern Alabama and not as serious closer to Tennessee. Fungicide comparisons yielded recommendations, but research concluded that once target spot infects a field, no fungicide can prevent the disease from spreading.

Leveraged funds \$66,500 on \$30,000 initial investment
ROI = \$2.22 for every dollar invested

Impacts Reported:

In research trials that tested the impact of treating cotton acres twice with Headline or Twinline fungicides, cotton yielded a 150 lb per acre gain. At a cost of about \$30 per acre for the treatment, growers netted an additional \$105 of income per acre.



Target spot
Credit: Travis Faske, U of Arkansas

When researchers tested whether cultural controls such as cropping methods or rotations would impact disease intensity, they found that target spot intensity was not affected by cropping methods, and a cotton behind cotton rotation yielded higher yields than a sorghum-cotton rotation.

Potential Impacts:

If growers in at-risk areas around the region applied fungicides to prevent the disease, they would see an increase in income of \$3.2 million. Gains would be even higher on the 700,000 acres in Georgia severely vulnerable to target spot.

Integrated Weed Management Options for Southern Vegetable Production

PD: Nathan Boyd, University of Florida

In light of the loss of methyl bromide, land-grant extension personnel have been working with southern vegetable growers on viable IPM alternatives. The project evaluated and compared pre-emergence herbicides, and evaluated integrated weed

management approaches for purple nutsedge. Researchers concluded that nutsedge management during fallow periods reduces nutsedge density in the crop. Fumigation is necessary to sustain tomato yields and reduce nutsedge density. The project produced recommendations about when to use pre and post-emergent herbicides and which were the most effective. A combination of weed management during the fallow period, fumigation and post emergence applications of halosulfuron is recommended in areas where purple nutsedge is a problem.



Purple nutsedge
Credit: Forest & Kim Starr, U.S. Geological Survey, Bugwood.org

Impacts Reported:

Although researchers had hypothesized that weeds could be controlled without fumigants in Florida, they discovered that herbicides could not replace fumigants and that both are needed to achieve satisfactory results. However, results did indicate that the application of both pre and post-emergence herbicides is not necessary, and adequate weed control can be achieved in some cases with a single application. The information has the potential to reduce herbicide applications in some situations.

The project also initiated some collaborations with other groups, including one between the University of Florida and one of the major tomato growers in the region, and one with the Florida Strawberry Growers Association. Although the project did not work with strawberry, PDs are currently evaluating the same herbicides for use in that crop.

Potential Impacts:

The most effective fumigant / herbicide application is currently fumigation with PicClor60, followed by applications of Sandea. However, multiple Sandea applications are already resulting in Sandea-resistant nutsedge. If growers reduced the number of applications of both PicClor60 and Sandea to only one per season rather than two, they would also delay the onset of resistance of other populations of nutsedge.

Featured Projects

Project Spotlight: A Low-cost, IPM Curriculum for Public Schools and Municipalities PD: Janet Hurley (2013 Special Priority: Residential IPM)



Credit: Fudd Graham, Auburn University

IPM professionals who need to boost their continuing education credits or work toward license renewal now have a way to get them without traveling long distances to attend an

expensive workshop. Thanks to a new web-based school IPM course curriculum developed by Texas A&M AgriLife specialists, school IPM coordinators, animal control and code enforcement officers, and pest management professionals can get training and continuing education credits without ever leaving their desks.

Located at <https://txn.esslearning.com/catalogs/agrilife/>, the online workshop series contains nine courses. Topics range from basic integrated pest management to specific pests such as ants or stinging insects, to recommendations for IPM program procedures. Each course contains a pre-test to gauge current knowledge, slides and handouts that thoroughly explain the biology of each pest, management procedures and best practices.

Janet Hurley, school IPM specialist at Texas A&M AgriLife Extension and mastermind behind the curriculum, says that every year she would receive calls from someone who needed continuing education credits for IPM but had a limited travel budget.

Every course carries at least one hour of continuing education credit for any IPM professionals. Courses include:

- Ants 101 (Cost: \$25, CEU Credits: 1 hour or 1 pest CEU credit toward license renewal)
- Bats 101 (Cost: \$20, CEU Credits: 1 hour, and TCLEOSE credit for animal control officers)
- IPM Basics (Cost: \$10, CEU Credits: .5 hour)
- Texas School IPM Coordinator Crash Course (Cost: \$20, Credits: 1.50 hour)
- Mosquitoes 101 (Cost: \$20, Credits: 1 hour; TCLEOSE credit)
- Pollinators 101 (Cost: \$20, Credits: 1 hour)
- IPM for School Gardens 101 (Cost: \$25, School IPM coordinators and teachers earn 1 hour of certificate credit)
- IPM for Texas Schools 101 (Cost: \$25, Credits: 1 hour)
- Stinging Insects 101 (Cost: \$25, Credits: 1 hour and TCLEOSE credit)

Hurley and her colleagues decided on the Texas e-learning platform only after trial and error with other web servers. Hurley had already fielded complaints from school staff who could not get past their school's firewall to access other servers. She finally decided to place the courses on a server used by the city government.

Hurley says the list of courses currently on the site is only the beginning. IPM Institute director Tom Green and his colleagues are working on another 20 online courses to be added to the site in 2015. And each part 1 course will eventually have a part 2.

Featured Projects

Project Spotlight: eFly: Southern spotted wing drosophila working group PD: Hannah Burrack (Special Priority: Spotted wing drosophila)



Drosophila suzukii on raspberry
Credit: Hannah Burrack, NCSU

In 2012, NC State University small fruit specialist Hannah Burrack and several Extension specialists from other universities in the South gathered around a table to pool their experiences with

spotted wing drosophila. Funded by a SIPMC Critical and Emerging Issues grant, they developed a list of regional priorities for the pest and shared information about the resources that each university could contribute.

The meeting was the first step to forming a formal working group, which they named eFly, since they planned to coordinate national and regional information about SWD. Using funding from a 2013 IPM Enhancement grant, they developed a website (<http://swd.ces.ncsu.edu>) and kept track of online conversations and projects through an online resource organizer called Basecamp. The group's goal was to reduce redundancy and conflicting information and essentially have "one voice" on SWD management.

The website houses the priorities the group developed in 2012, along with a report of agricultural impacts from SWD on the east coast. The impact report is the only description of SWD actual and potential impacts at this large of a scale. The group did a survey that included respondents from 28 states to find out how many growers grew SWD-host crops. The average, minimum and maximum reported percentage loss across all responses for each crop was calculated. When totaled across all crops, the observed loss due to SWD during 2013 in those 28 states was \$27,558,238.

In addition, the survey revealed that SWD had resulted in over \$1.3 million dollars in increased pesticide use by responding growers, an average of 87% increase in pesticides associated with managing SWD as compared to before this insect pest was detected. Labor costs also increased, by 13 percent.

The report became a major resource for faculty writing grants, viewed over 209 times since it was posted. Burrack says that it has been used multiple times and resulted in both research and extension funding.

In addition to the two documents created in 2012, the site also contains links to individual scientific publications about SWD ecology, biology and management, along with extension resources from institutions involved in SWD research.

Burrack's research resulted in the discovery of a better SWD trap as well, using a sugar, yeast and wine solution rather than the apple cider vinegar mixture they used in the early days of SWD detection. The new solution not only attracted more flies, but it began catching them earlier in the season, giving growers a head start on prevention. The website allowed her to publicize the results to specialists in other states who are either dealing with or preparing for SWD.

Information from the eFly website has generated hundreds of thousands of dollars in returns. In Burrack's laboratory alone, proposal writers have received a total of \$219,426 in funding after using the information provided in the website.

**Leveraged funds \$219,426 on \$29,321 initial investment
ROI = \$ 3.75 per year for every dollar invested**

Featured Projects

Project Spotlight: Extent of multiple herbicide-resistant weeds and predicting risk of further herbicide resistance in Georgia

PD: William Vencill (2013 Special Priority: Herbicide-resistant weeds)

Researchers at the University of Georgia have discovered the first populations of atrazine-resistant Palmer amaranth and sicklepod in herbicide-tolerant cotton.

The discovery of glyphosate-resistant Palmer amaranth in 2004 changed the rules for weed control in crops. After GM glyphosate-tolerant cotton varieties became available in 1997, growers became increasingly dependent on glyphosate to control weeds. By reducing the amount of herbicide needed, Round-up Ready® cotton helped growers save money and increase profits. From 1997 to 2008, the value of using herbicide-tolerant cotton was about \$461 million. Herbicide-tolerant cotton also made possible the use of no-till technology, reducing soil erosion, improving soil structure and increasing carbon sequestration.

But the sole use of glyphosate, often at reduced rates, created selection pressure for weeds for at least seven years. Palmer amaranth, the first weed to develop tolerance to glyphosate in season, now infests 10 states, has increased production costs by 200 percent and has increased the amount of herbicides applied by 150 percent. Growers have turned to tillage, and 92 percent of growers hand-weed in addition to using herbicide applications.

To discover other herbicide-resistant weeds before they became a problem of the scope of GR Palmer amaranth, University of Georgia weed scientists William Vencill and Tim Grey led a working group in 2013 to survey the state for budding herbicide-resistant weeds. Using funding from an IPM Enhancement grant, Vencill's working group surveyed 28 fields in Georgia for weeds and tested them for resistance to any of seven different herbicide modes of action.

Herbicides tested included glyphosate, imazapic; fomesafen; glufosinate; atrazine; 2,4-D and sethoxydim. Scientists did a dose response study to analyze the level of herbicide resistance. They collected twelve different weeds.



Palmer amaranth, *Amaranthus palmeri*
Credit: Ross Recker, University of Wisconsin-Madison, Bugwood.org

As expected, Palmer amaranth was the most common weed, with 69 percent of those populations exhibiting glyphosate resistance. Vencill and Grey found no other weeds that were glyphosate resistant.

However, they found two weeds—one population of Palmer amaranth and another of sicklepod—that were atrazine resistant. The discovery of atrazine-resistant Palmer amaranth among cotton is the first case outside of a dairy operation in Georgia. The discovery of atrazine-resistant sicklepod is the first reported case of this weed.

None of the weeds they tested were resistant to any Group 2, 4, 10, or 14 herbicides. The news was positive for growers who have been rotating glyphosate with glufosinate (Group 10), but

the introduction of auxinic-resistant crops (Group 4) will increase the chance of resistance to that group of herbicides if growers do not adopt a rotational program.

The study alerted extension specialists for other major crops to survey fields for atrazine-resistant Palmer amaranth and sicklepod. Future educational programs may help growers choose alternative herbicides to reduce the possibility of additional herbicide-resistant troublesome weeds.

Friends of IPM Awards

Two graduate students and five seasoned IPM professional individuals or groups will receive recognition for being Friends of Southern IPM this year. This year's contest yielded competition in every category that received nominations.

Graduate Student, Ph.D. Award: **Jhalendra Rijal, Virginia Tech**



Jhalendra Rijal has done extensive research on the biology and ecology of grape root borer, an economically important pest of grapevines. Because grape root borers spend their larval stages in the soil, scouting has been non-existent,

and no thresholds exist for the pest. Rijal spent months studying the borers' growth stages to find out if he could find a way to scout for them once they were above ground.

He found that the borer pupated above ground, and from the number of pupal cases, he could determine whether or not a vine was infested. His research led to a monitoring protocol that will help growers make sound management decisions for grape root borer for the first time. In addition, he studied soil characteristics and root volatiles to find out why some vineyards are more infested than others and whether grapevine roots emitted a chemical that attracted the root borer. His investigation into the soil characteristics showed that root borers were more likely to inhabit soils with a specific clay-to-sand ratio. Rijal received his award at the Southeastern Branch ESA meeting in March.

Graduate Student, Masters Award: **Molly Stedfast, Virginia Tech**

Molly Stedfast is an energetic masters student who has helped residents in low-cost housing cope with bed bugs. After conducting a survey of apartment facilities person-

nel and residents to find out how much they knew about bed bugs, she developed a training program that included information on bed bug biology and behavior, and practical instruction on methods of prevention and control, gained from research that she did on the development of low-cost, minimally toxic control methods.

Not only did she conduct resident and staff training, but she also personally applied diatomaceous earth to 120 apartments as a perimeter barrier. Her prevention protocol prompted the staff of a housing management company in New Orleans to ask her to train their staff members about how to apply the barrier and build a heat box. According to nominator Dr. Dini Miller, Stedfast "has had more face to face contacts and has treated (crawled through) more infested apartment units than any other MS student in the United States." Stedfast received her award at the Eastern Branch ESA meeting in March.



Bright Idea Award: **Southern Nursery IPM Working Group (SNIPM)**

The Southern Nursery IPM Working Group (SNIPM) received the Bright Idea award for their development of mobile information technology in the green industry. In particular, the group has developed two applications: a mobile app called IPMPro and an e-book, IPM for Select Deciduous Trees in Southeastern US Nursery Production.



Friends of IPM Awards

IPMPro is an app designed to encourage scouting by alerting growers to emerging pests. According to surveys, nursery growers typically discover pests while performing other tasks and then spray. With a text alert on their phone that warns them of upcoming key pests, growers can catch early pest populations before they have had a chance to do significant damage. The e-book IPM for Select Deciduous Trees is an innovative interactive book in multimedia format that has increased savings or earnings for growers by an average of \$3,313 per book due to reduced pesticide use and more effective pesticide applications. SNIPM was awarded during the Southern Nursery Association conference in July.

IPM Implementer Award: City of New Orleans Mosquito, Rodent & Termite Control Board

Director Claudia Riegel and her team have spent several years not only cleaning up buildings wrecked by Hurricane Katrina, but changing how people think about pest control. The team's efforts to prevent and control mosquitoes and rodents have been featured on Discovery Channel and National Public Radio.



Dr. Riegel began implementing a city-wide IPM program in 2008 as buildings destroyed by Hurricane

Katrina were repaired or rebuilt. Her biggest challenge was convincing staff to reduce clutter and keep properties clean to prevent pests rather than simply doing continuous chemical control. By 2011, most city employees were practicing IPM in their buildings. Dr. Riegel has also worked to include schools in the IPM program. After encountering resistance in the general city schools, she

approached charter school John McDonogh High School. With the help of the entire NOMTC staff, school staff and volunteers working for a year, she was able to turn a building that had received a "D" in a pest assessment to an "A+". Other charter schools are now requesting the team's help. The team was recognized during the City of New Orleans City Council meeting in April.

IPM Educator Award: Gus Lorenz, University of Arkansas

Dr. Lorenz is not new to the Friends of IPM Awards program; his Midsouth Entomology Working Group received the Pulling Together award in 2011. Field crops, especially cotton,



corn, rice, grain sorghum and soybeans, are his specialty. As IPM Coordinator, Dr. Lorenz combines research with extension, finding out information that growers can use and then teaching them about changes in practices. For instance, recently Dr. Lorenz and collaborators in Tennessee and Mississippi concluded that some of the chemicals in question with regard to colony collapse disorder are not expressed in plant pollen, having implications for regulatory decisions as well as pest management decisions on the farm.

Dr. Lorenz not only spends time with growers in educational meetings and consultations in the field, but he also works with graduate students as well. He devotes about \$600,000 to grower training and graduate student support every year. In addition to face-to-face meetings, Dr. Lorenz disseminates information through newsletters, articles, reports and popular press articles. Dr. Lorenz received his award at the Southeastern Branch ESA meeting in March.

Friends of IPM Awards

Pulling Together Award: Saltcedar Biological Control Team

Dr. Allen Knutson, Dr. Mark Muegge, Dr. Jerry Michels and research associate Erin Jones, entomologists with Texas A&M AgriLife Research and Extension, used a beneficial beetle to control an invasive weedy shrub named saltcedar.



This large shrub grows in extensive thickets along streams and around reservoirs in arid West Texas. Saltcedar is an undesirable brush

species that uses precious water resources, competes with forage grasses, degrades riparian areas and invades adjacent agricultural areas. From 2004-2008 Texas farmers and ranchers spent \$2.3 million to control saltcedar. In 2008 Texas A&M entomologists organized the Saltcedar Biological Control Team to research and implement biological control of saltcedar using leaf beetles imported by USDA-ARS entomologists.

Team members released and evaluated three species of leaf beetle (*Diorhabda*) at sites extending from Big Bend National Park on the Mexico border to the northern Texas Panhandle. Team members collected and released more than a million beetles and also trained NRCS personnel to release the beetles. Since then, beetles have been feasting on saltcedar foliage, defoliating thickets of trees along hundreds of miles of river corridor. The impact on the state has been so positive that the Saltcedar Biological Control Team won the Texas A&M University's Vice Chancellor award last year. The team was awarded during the Southwestern Branch ESA meeting in February.

Lifetime Achievement Award: Dan L. Horton, University of Georgia

Soon after joining the University of Georgia faculty in 1982, Dr. Horton implemented a proactive regionalized IPM program for fruit crops. He collaborated with colleagues across

state lines and worked for consensus in IPM recommendations. Although fruit is a high value commodity in the Southeast, their climate requirements confine them to certain areas across states, so univer-

sity resources dedicated to fruit crops have shrunk over several years. Despite this, Dr. Horton was determined to make fruit farming a successful industry in the South.

Dr. Horton's approach to IPM acknowledges all disciplines. For instance, he collaborated with plant pathologists in the region to develop and administer virus testing for plum pox virus, and he works with other researchers to create IPM recommendations to replace pesticides that have been withdrawn from the market. The Georgia Peach Grower's Handbook, developed for the state's growers, is now considered a regional publication and is used throughout the southeast. Dr. Horton received his award at the Southeastern Branch ESA meeting in March.



Looking Ahead

2014 IPM Enhancement Grant Projects

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

Susan Bramen, University of Georgia

Initiation of an integrated regional response to an invasive aphid pest of sorghum

Michael Brewer, Michael Way, Raul Villanueva, and James Woolley, Texas A&M AgriLife Research

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

Daniel Carrillo and Jorge Peña, University of Florida

Update to selected North Carolina crop profiles

Barbara Fair, North Carolina State University

Managing target spot, caused by *Corynespora cassilicola*, in cotton

Austin Hagan, Auburn University

Experiential nursery IPM workshop series to enhance grower adoption and extension agent facilitation

Anthony LeBude, et al., North Carolina State University

National IPM Information System

For almost fifteen years, the NSF Center for IPM – SIPMC’s home base – has designed, improved and maintained an array of national IPM databases, websites and other online technical tools. Products include the databases of Crop Profiles and Pest Management Strategic Plans, a database of USDA-funded IPM research and Extension projects, and a grants competition management tool used by the Regional IPM Centers. Until this year, our work on these projects was funded by a series of annual grants from USDA-NIFA. We continue to do this work, now under the auspices of a supplement to our core SIPMC grant.

One important component of this project that is nearing fruition is the redesign of the national websites ipm.gov and ipmcenters.org. In fact by the time you read this, designer Alex Belskis will probably have the re-designed sites online. Check them out – you’ll see a new look, a more user-friendly design, and a lot of good information.

Component-level databasing for Crop Profiles and Pest Management Strategic Plans (PMSPs) is a project we initiated about a year ago. Crop Profiles and PMSPs contain a wealth of information, but presently the information is contained only in individual documents - each one a separate PDF file. Searching for specific information across all documents (for

Genetic characterization of an emerging aphid pest in sorghum

Raul Medina, Texas AgriLife Research

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

Mathews Paret, et al., University of Florida

Evaluation of Sanitation as an IPM tool for SWD control in blueberry

Glen Rains and Ashfaq Sial, University of Georgia

Texas turfgrass crop profile and Pest Management Strategic Plan (PMSP)

Casey Reynolds, Texas A&M AgriLife Extension

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

Guido Schnabel, Clemson University



instance, to find all the different crops that a certain pest attacks, or to find all the different crop/pest situations

in which a certain pesticide is used) is a slow and tedious process. So, we’re (figuratively) pulling apart all of the documents and re-sorting the information into a searchable, interactive database. Think of it as reshuffling a deck of cards. Using a database, we will be able to quickly pull up all the jacks, or all the clubs, or sort from 2 to ace. Robin Boudwin has made great strides in designing the system, and we recently hired Kimberly Lewis to help with transferring data from the old system to the new.

Finally, we will soon be working on components that support other new efforts mentioned elsewhere in this report. The IPM eAcademy needs infrastructure to manage, archive and stream the presentations. We will produce and manage websites and databases to facilitate Regional IPM Roundtables – these will probably be very similar to the work we have already provided to International IPM Symposia. We have also initiated discussions with Northeast IPM Center staff targeted at expanding their online resources database to a national approach.



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