Southern IPM Center

2018 ANNUAL REPORT

Southern Integrated Pest Management Center

From the Directors

We are pleased to be writing this preface today; we were just informed that we will receive another four years of funding from the National Institute of Agriculture (NIFA) to support the Southern IPM Center. This new round of funding brings new ideas, new initiatives, and some new faces. It also continues to support the excellent work we have already been doing.

As has been true in the past, we are focusing our efforts on a number of key programs or "Signature Programs." In this coming grant cycle, these include: Invasive Species, Supporting Underserved Audiences, Resistance Management, and Pollinator Protection. These programs are in their formative stages and we encourage you to get involved. Be sure to watch our social media feeds for more information on each of these programs as the year progresses.

One area that we are highlighting as a priority is the updating of out-of-date IPM documents. In our last grant cycle, we developed the National IPM Database, which contains 1,082 documents covering IPM practices in commodities and settings across the nation. Of the 964 documents in the southern region, 275 of the 298 Crop Profiles and 37 of the 41 Pest Management Strategic Plans (PMSPs) are 5 years old or older. Federal regulators refer to documents and information less than 6 years old. These documents also have great value for grant programs since they ask applicants to cite stakeholder input and the impact certain pests and diseases can have in a commodity or setting. Clearly there is a critical need to update Crop Profiles and PMSPs, especially in the South. This fund will be open for stakeholders interested in updating Crop Profiles or PMSPs. As part of this new emphasis, we have hired a new program manager, Ms. Wendy Britton, who will work with Dr. Seth Carley and Ms. Robin Boudwin to assist the facilitation of PMSP workshops and support stakeholders interested in updating documents.

We will continue to support many of the other programs you have come to know and value. We will be giving out nearly $250,000 in our Enhancement Grant program (our RFA just went out, so be sure to check our website for more information). The Friends of IPM Awards are another way we connect with our community, and highlight great works in the area of IPM. The call for nominations will go out soon, so be on the lookout. While it is only the beginning of our newest chapter, we are always looking ahead; how can we improve and where can we make a difference? As we look toward the future, we encourage you to reach out to us to let us know how we can help. We truly value our stakeholders, and are always searching for ways to move toward the common goals of protecting the health of people and environment, and reducing economic risks associated with pest management.

If you are interested in learning more about any of the programs mentioned above, visit our website or contact one of our Directors. We look forward to hearing from you soon.

Danesha Seth Carley and Joe LaForest, Co-Directors

The Southern IPM Center serves 13 U.S. Southern states, Puerto Rico and the U.S. Virgin Islands. We are supported by USDA National Institute of Food and Agriculture Agreement No. 2014-70006-22485.

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Southern IPM Center

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A New Working Group Takes the Bite out of Conehead Termites

Invasive Conehead Termite IPM Working Group

Project Director: Sue Alspach, Florida Department of Agriculture and Consumer Services

Grant Amount: $9,910

Sue Alspach, an environmental specialist with the Florida Department of Agriculture and Consumer Services (FDACS), used funding from a Southern Integrated Pest Management Center IPM Enhancement grant to gather experts from many agencies in Florida to form a working group to deal with the pest.

Native to the Caribbean and Central and South America, the conehead termite was discovered in 2001 in Dania Beach, Florida. Eradication efforts began in 2003 and seemed successful, but in 2011 colonies began to appear again. Since 2012, 90 properties in two cities in Broward County, Florida, have been infested with conehead termites—77 in Dania Beach and 13 in Pompano Beach.

Unlike subterranean termites, which live predominantly underground, the conehead termite—named for the soldier's cone-shaped head—builds its nests and tunnels above ground. Although that may make them easier to spot than subterranean termites, conehead nests often are intermixed with brush or debris. In abandoned sites that are overgrown, colonies can thrive and multiply quickly, with the aid of multiple kings and queens in each nest.

In March 2015, two years before the working group formed, FDACS discovered the heavily infested Dania Beach property - 26 nests were scattered around the 2/3-acre vacant, overgrown lot, and termites had spread to the landscaping around 11 adjacent homes. FDACS performed two treatments on the property but the heavy overgrowth inhibited staff's ability to perform a thorough survey and confirm the efficacy of those treatments. At the time the working group met in November, the status of the property remained unclear. To assist in the eradication of coneheads from their city, Dania Beach government hired their landscape contractor to mow, weed whack, and chip tree debris on the ground thereby reducing food sources, hiding places, and making it possible to thoroughly survey the property.

Photo credit: B.L. Thorne

Alspach held two meetings for the working group, which consisted of professionals in agriculture, pest control, natural resource management and local agencies. Before the first meeting, 6o percent of group members indicated their knowledge of conehead termites was fair to non-existent.

The first meeting brought together many people who were unfamiliar with the termite but excited to be involved. Alspach said that the energy in the room was palpable. Her supervisors were amazed at the number of people who wanted to help.

On February 6 and 7, 2018, during the second working group meeting and the day after, the group filmed a video of the final clean-up of Dania Beach. The video is available on YouTube at https://www.youtube.com/watch?v=CXFoKcWtkfQ .

Out of the 90 properties in Broward County that have had coneheads on them at some point in the past, only one is still infested - a 3.4-acre undeveloped property in Pompano Beach. Currently there are no known active properties in Dania Beach. Surveys on those properties must continue, though, to monitor for young, emerging colonies that can remain hidden for several years.

The collaboration on conehead eradication earned her another bonus—a $173,000 agreement from USDA Animal and Plant Health Inspection Service.

New Resources Available for Tawny Crazy Ant Management

Creation and Dissemination of tawny crazy ant extension materials

Project Director: Lawence C. "Fudd" Graham, Auburn University

Grant Amount: $40,000

A working group focusing on the tawny crazy ant is developing materials to help people identify and manage this pest.

First funded in 2015, the Tawny Crazy Ant Working Group used a 2017 IPM Enhancement grant to create videos, conference booth materials and booklets with information about the ant.

The tawny crazy ant was discovered in Houston, Texas, in 2002 by pest management professional Tom Rasberry. Since that time it has spread to all states in the Gulf Coast, traveling primarily through unintentional human assistance.

Although individual state Extension services have released information about the tawny crazy ant, insecticide treatments are still the major way to deal with the pest. Concerned about the impact on the environment coupled with the possibility of insecticide resistance down the road, Extension personnel in the Gulf states have been racing to gather information about the pest and disseminate it as widely as possible.

"We formed the working group to coordinate state efforts to prevent the spread of another invasive pest," said Lawrence "Fudd" Graham, Extension specialist for Auburn University.

Unlike many other ant species, tawny crazy ants form huge colonies. If the colony is disturbed, the queen leaves first, forming another colony elsewhere. That makes eradicating the colony difficult.

Tawny crazy ants are also much more destructive than other ant species, causing electrical outages and literally suffocating livestock and other animals.

The working group helped produce six videos about tawny crazy ants, each of which delve into a different aspect of the invasive pest. Videos include information about the biology, habitat, and identification of the pest along with tips about how to prevent colonies and collect samples to send to labs. The video series is available on YouTube at https://bit.ly/2Lmq9ZD and through the Alabama Cooperative Extension Service.

That's not dirt: tawny crazy ant infestation.
Photo credit: Dan Culbert, UF/IFAS Extension Okeechobee County

Kelly Palmer, Regional Extension Agent and co-leader of the working group, presented the videos to attendees of the National Conference on Urban Entomology. Afterwards, she said, several people requested access to the videos.

"The feedback on the videos was amazing. Representatives from chemical companies requested to use them," she said. "One faculty member at the University of Florida wanted to show them to her classes."

In addition to the videos, the group decided to develop a backdrop shade to bring to meetings, along with flyers and four-page handouts for different audiences. The handouts will be tailored to pest management professionals, homeowners, nursery owners and cattle owners.

A more detailed 12-page brochure will be available online at the Alabama Extension and Southern IPM Center websites for Pest Management Professionals.

Inspections + Monitors Equals Bed Bug Detection in Multifamily Housing

Efficient Building-Wide Inspections for Early Detection of Bed Bugs in Multifamily Housing

Project Director: Karen Vail, University of Tennessee

Funding Amount: $30,000

Ask most people which insect they dislike the most, and the bed bug will be one of the most common answers. Stealthy and hard to eradicate, bed bugs are the one pest that cause emotional distress, even to the point of depression. As difficult as they are to manage in a standalone house, they're even more difficult to control in multifamily housing complexes.

Although routine visual inspections are the recommended prevention for bed bugs, thorough inspections can involve several hours, between wading through a resident's belongings to turning over pieces of furniture. In addition, these types of inspections often miss small or beginning infestations.

University of Tennessee researcher Karen Vail used her IPM Enhancement Capstone project to finish testing a combination of detection methods developed during a Southern IPM Regional grant and to survey building managers about how they were incorporating recommendations from the results of the grant. Results from the previous grant showed that one to four bed bug pitfall monitors placed under/near the legs of furniture and inspected at 2 week intervals detected low-level bed bug infestations. Vail's project set out to determine which inspection type—monitors alone or a quick inspection with monitors—was most effective and how often inspections needed to be done, requiring the least amount of time and money.

Vail's team conducted eight building-wide bed bug inspections in low-income apartment complexes for the elderly and disabled. Specialists did not add monitors unless they suspected bed bugs were present but could not find them, as monitor inspection required a second trip to the apartment.

Upon completion of the project it was determined that apartment managers were unaware of 73% of the bed bug infestations in their buildings. Results from the project revealed that all inspection techniques effectively detected bed bug infestations. More replication is needed to determine which combination of quick inspection and monitor number was the most efficient. In the case of one small infestation, adding monitors to the apartment appeared to have prevented bed bug establishment.

VA survey conducted at the 3rd Annual Tennessee Bed Bug Management in Low-income Multifamily Housing Meeting indicated the following:

- 44% of attendees use monitors to detect bed bugs, and 67% not currently using monitors plan to do so.
- 50% of attendees use building-wide inspections, and 61% not currently doing them plan to start.

A seminar at the Tennessee Association of Housing and Redevelopment Authorities 2018 Spring Workshop presented three bed bug scenarios in low-income housing for attendees to solve, promoting peer networks to help solve problems in the future.

Managers in two buildings where research personnel had conducted inspections were conducting inspections on their own. Infestation rates were at a low of 1.4% and 8.3%, and most infested apartments had about one or two bed bugs, and none had more than 50. These programs used heat as the main management method rather than insecticides.

Sweet potato project reviews thresholds and varieties

Improvement of Sweet Potato Insect Pest Management in the Southeast

Project Director: Fred Musser, Mississippi State University

Grant Amount: $29,952

Sweet potatoes suffer from attack by several insect pests during the growing season. While early season insecticide applications provide some control, the WDS complex, a complex of pests that includes wireworms, Diabrotica and Systena larvae, can cause root damage later in the season. Sweet potatoes are a $486 million industry for the Southeast, yet sweet potato insect management protocols have not been updated for several years.

The WDS complex reduces yield by about 11 million dollars a year, and approximately 30% of roots would be damaged by the WDS complex in the absence of insecticides. Late season management is limited to foliar insecticides. However, few trials have been done to determine whether or not these foliar applications are effectively controlling the pests.

Although some research has been done on insect resistant varieties, more research on varieties that do well in the Mississippi climate and soils is needed. Mississippi sweet potato farmers need varieties that will not only resist insect pests but will also be disease resistant and high-yielding.

An IPM Enhancement project led by Fred Musser at Mississippi State University set out to evaluate thresholds for foliar insecticides targeting the WDS complex and to screen sweet potato varieties for insect resistance.

Scientists conducted threshold trials at two locations throughout the season and rated damage at harvest. At one location, adult insect densities were higher but damage caused by larvae was lower than at the other location. In terms of varieties, researchers found two varieties that were more resistant to insect damage than others. The variety Murasaki was best in terms of resisting insect damage, but had a slower growth habit and lower yield than popular varieties. The variety Bayou Belle, although not as resistant to insect damage as Murasaki, yielded as much or more than popular varieties.

The project increased collaboration between Mississippi State University and Louisiana State University. Musser indicated that research on new thresholds would take several years and plans to continue research next season.

Carbon nanotubes may help manage pecan bacterial leaf scorch

Therapeutic management of pecan bacterial leaf scorch using carbon nanotubes in Texas

Project Director: Young-Ki Jo, Texas A&M AgriLife University

Grant Amount: $30,000

Pecan bacterial leaf scorch (PBLS) has been an emerging problem for the pecan industry since 2015. The disease defoliates the plant and can cause major yield losses in susceptible varieties. Xylella fastidiosa, causal bacterium, infects at least 309 other plant species, but proper diagnostics of PBLS were not established until recently.

In addition to infecting rooted plants, the bacterium infects scion and rootstock specimens for grafting. Although there is no cure, disease progression and distribution can be minimized by heat treatment. Currently hot-water treatment is the sole management method, but its efficacy and effect on plant health need further validation.

Jo's project tested another possible heat treatment by carbon nanotubes (CNT) and microwave exposure. Although CNT are not antibiotics, they can be easily translocated into xylems and absorb exogenous microwave energy rapidly that can produce heat intense enough to cause a localized thermal spike in the plant. CNT with less than 5 seconds of microwave treatment can hamper bacterial growth better than hot water treatment, with limited adverse effect on plant tissue. While they need to validate the results with fresh scionwood harvested in this winter, the preliminary results were promising.

Jo and his colleagues presented information on pecan bacterial leaf scorch and its management options to pecan growers at the Texas Pecan Growers Association conference in July 2017. A survey taken afterwards indicated that at least 80 percent of growers who took the survey understood how to identify the disease and would consider to adopt one of the management options presented during the conference.

Southeastern cotton growers now have IPM resources for tarnished plant bug

Fact-finding and early research for regionally-specific IPM for plant bug in Southeastern US Cotton

Project Director: Sally Taylor, Virginia Polytechnic and State University

Grant Amount: $30,000

A project re-examining tarnished plant bug thresholds in Virginia is helping cotton farmers make better decisions about insecticide sprays for tarnished plant bug.

A cotton pest that has been problematic in the mid-southern U.S., plant bug has recently plagued farmers in Virginia and North Carolina. Because thresholds for plant bug were developed for mid-south cotton, they are not as effective for the upper Southeast because of differing climate and planting times. To keep plant bug populations at a minimum, many cotton farmers in Virginia and North Carolina have resorted to a scheduled spray program.

Sally Taylor, an entomologist with Virginia Tech, gathered a team of experts to reassess plant bug thresholds and assess the most effective treatment recommendations to manage the pest. After several trials, her team determined that neither the mid-South thresholds nor the current grower treatment strategy was effectively reducing plant bug infestations. They then set out to define new thresholds specific to the Southeast.

Researchers tracked tarnished plant bug in 23 fields in 8 counties in 2017. After creating a distribution map that they shared with growers, the researchers investigated when plant bug feeding caused the greatest damage.

After examining plant bug feeding during six different cotton growth stages, the team discovered that the pest injured cotton plants most when the plants first began to form flower bugs and during the third week of bloom. Yield loss was greatest when infestations were during the first week of bloom treatment.

Researchers also discovered that yield increased the most when plants were sprayed early in the boom period or when bug populations reached threshold. Late-planted cotton was highest at risk for infestations.

Farmer training during field days, conferences and other outreach helped educate farmers about identifying plant bugs. At the Cotton Production Meeting in Franklin, Virginia, 85 percent of farmers surveyed indicated they knew plant bug was in their field, while 81 percent were concerned about it. The number of growers who could identify the pest had doubled from the previous year.

Instead of applying insecticide at random intervals, 84 percent of growers were now scouting for plant bug, and 78 percent were applying insecticide if threshold was reached, a 9 percent increase from the previous year.

Although insecticide use for tarnished plant bug will continue to be necessary, most growers are now applying it using integrated pest management principles, such as thresholds and targeted applications, rather than scheduled seasonal sprays.

Smartphone app streamlines IPM for specialty crops

Streamlining and Advancing the Smartphone 'MyIPM' App Series

Project Director: Brett Blaauw, University of Georgia

Grant Amount: $28,417

A smartphone app that combines and expands three separate IPM apps is changing the way growers in the Southeast manage pests and diseases. The new MyIPM app combines content from MyIPM apps for strawberry and peach diseases, northeastern diseases of apples, cherries and cranberries and southeastern pests of peaches, strawberries and blueberries. In addition, it adds information about blueberry diseases and apple, pear, cherry and cranberry pests.

The original MyIPM app contained photos to identify diseases of peaches and strawberries. It was so popular that growers in other areas of the country wanted an app for their crop diseases, and southeastern growers wanted identifying information on insect pests. Clemson researchers Brett Blaauw and Guido Schnabel, in addition to colleagues from Georgia, developed two other apps: MyIPM-NED, containing northeastern diseases of apples, pears, cherries and cranberries; and MyIPM-SEP, containing southeastern insect pests of peaches, strawberries and blueberries. Growers found it cumbersome switching between different apps, and they wanted additional content to help with resistance management.

With the help of an IPM Enhancement grant, Blaauw and Schnabel created a new MyIPM app that combines the content from the original three apps with information about pesticide recommendations, resistance management, extension publications and other science-based content. Interactive tables of active ingredients and trade names make resistance management easier. The app also includes information about insect pests for peaches, apples, pears, cherries and cranberries. In addition to identification information and spray recommendations, growers now have spray guides and extension fact sheets at their fingertips anytime they need them.

Since the app's release on December 11, 2017 and March 31, 2018, the new MyIPM app has had at least 1,070 unique downloads with a total of 1,034 updates, indicating that users continue to use the app after downloading it. MyIPM Working Group members presented and demonstrated the app at seven grower meetings. Surveys completed by 60 growers demonstrated that 22 growers at the grower meetings had not yet used the app and 38 growers had used it.

Of the participants that had used previous versions. 65% agreed that the app has helped them manage pests, and 70% agreed that the app has increased their knowledge of pests and IPM. After the presentations, there were clear spikes in the number of downloads and 85% of previous users and 87% of potential new users said that they were going to download the new app.

Blaauw and Schnabel plan to measure changes in the reports of pesticide resistance and secondary pest outbreaks in South Carolina and Georgia to measure the effectiveness of the new app.

Citizen science project measures how trees stand up to climate change

MyTree: Using Citizen Science to Teach and Learn about Tree IPM in the City

Project Director: Steven Frank, North Carolina State University

Grant Amount: $29,866

Research at NC State University has found that trees in urban areas surrounded by hardscapes suffer from more insect attacks. But what about trees in urban yards? How does a changing climate affect the red maple in someone's backyard? A 2017 IPM Enhancement grant-funded project sought to find out.

Steven Frank from NC State University engaged citizen scientists from various locations in the country to measure the growth of their trees over the year. The goal of the project, called "A Tree's Life," was to determine how urbanization and background temperature affected tree growth and pest abundance, and develop integrated pest management and planting recommendations for residential trees. Frank worked with scientists from four other southeastern states to broaden the research and recommendations.

Frank recruited 200 citizen scientists from 34 states and 3 Canadian provinces to participate in the project. In addition to volunteers along the East coast, from Maine to Florida, volunteers from Denver, Kansas City, and Vancouver participated. Most participants were from the Carolinas and Pennsylvania.

To measure tree growth, volunteers, including Master Gardeners, Master Naturalists and other volunteers, wrapped a dendrometer band around the trunk of the tree. Volunteers were provided with training materials illustrating red maples and explaining how to identify them, along with instructions on how to use the dendrometers and measure the change in growth. After sending in information about the tree's location, volunteers e-mailed growth measurements at the beginning and end of the year. Frank plans to continue the project, collecting data every year.

The research team is still in the process of examining data and analyzing the preliminary results. As data is collected over time, the team hopes to see patterns in growth and insect density depending on the location of the three. Frank hopes that eventually the research will lead to similar planting strategy recommendations as the "Pace to Plant" instructions for trees in parking lots and streetscapes.

The study is ongoing. A map of participants in addition to information on how to participate is located at http://ecoipm.org/a-trees-life/.

2018 Funded Projects

The Southern IPM Center will spend $309,653 to address agricultural and urban issues during the next year with its IPM Enhancement Grant. Out of 32 proposals submitted to the program, a review panel outside of the region selected 11 for funding.

Seed Projects:

Does the invasive pest Drosophila suzukii manipulate the microbiome of its fruit hosts? Implications for management and ecology, Hannah Burrack, NC State University

This project will look at the microbial communities of the plants preferred by spotted wing drosophila to find out if the pest alters existing bacterial presence.

Red maple wildtype and cultivar pest susceptibility across urban planting conditions, Steven Frank, NC State University

Previous research has determined that red maple trees planted in urban areas surrounded by impervious surfaces. This project will compare the populations of gloomy scales on wildtype red maples to those in clonal cultivar and hybrid red maples in urban settings.

Surveillance and Characterization of Varroa Mite Acaricide Resistance in Virginia, Aaron Gross, Virginia Tech

Varroa mite is a major cause of honey bee losses, so control is imperative. This project will explore different IPM strategies for varroa mites and track varroa mite acaricide resistance in 3 regions of Virginia.

Foundational Research for the Development of IPM in Florida's Subtropical Peach Industry, Amanda Hodges, University of Florida

Because no thresholds exist for insects on peaches in south Florida, growers spray on a calendar schedule. This project seeks to identify the major pests of Florida peaches and determine the efficacy of practices currently used to develop extension guides.

Reassessment of Nematode Thresholds for Agronomic Crops in the Southeast, Hillary Mehl, Virginia Tech

Nematodes cause 10 percent of yield loss annually in the US. This project will re-examine thresholds for two less commonly publicized nematodes, stubby root and sting nematodes.

Determining effects of cover crop use on pest attraction to tomato, Rebecca Schmidt-Jeffris, Clemson University

While many growers use cover crops to suppress weeds and improve soil structure, cover crops can have additional benefits beyond just weed and pest control. This project will explore how cover crops affect soil health in ways that may alter pest preferences for crops.

Strawberry Disease Cycle Illustrations, Animations, and Time-Lapse Videos for IPM Education, Guido Schnabel, Clemson University

This project will develop illustrations and animations of various strawberry diseases to help growers identify specific pathogens such as gray mold and anthracnose in a timely manner.

Investigating Metolachlor Resistance in Palmer Amaranth, Cammy Willett, University of Arkansas

Palmer amaranth is a weed that can reduce yield by 70 percent and is found throughout the US. This project will look at the one remaining herbicide, S-metolachlor, to see if resistance has already begun and to address resistance with recommended IPM strategies.

Capstone Project:

Harvest Weed Seed Control for Management of Palmer Amaranth and Italian Ryegrass, Michael Flessner, Virginia Tech

This project will examine a relatively new method of control for two major weeds, Palmer amaranth and Italian ryegrass.

Working Groups:

A New IPM Working Group on Improving Biocontrol in Open-field Vegetables in the Southeast, Rebecca Schmidt-Jeffris, Clemson University

Often vegetable growers use pest management tactics that can impact natural enemies. This project will create a working group of stakeholders in the vegetable industry in VA, NC, SC and GA to improve biological control options in vegetables.

The Food Narrative Project--Southern Region, James Walgenbach, NC State University

Agricultural groups have recently turned to the media to get their messages out to the public. This project will study how the media can be used to publicize the message of what integrated pest management is and its place in the food and farming story.

2018 Friends of Southern IPM Awards

Winners from four Southern states were recognized this year as Friends of Southern Integrated Pest Management. For the first time this year, we awarded two Ph.D. students.

Lindsy Iglesias and **Zachary DeVries** tied for the Ph.D. student award. **Iglesias**, from the University of Florida, studied the distribution of spotted wing drosophila in the field. Her research led to the discovery that SWD populated mostly around the edges of the field, indicating that border sprays in the beginning of the season can reduce SWD populations.

Zachary DeVries, a Ph.D. from NC State University who is now in a postdoc position, has been working on integrated control of cockroaches in low-income homes. A 2018 IPM Symposium award recipient as well, DeVries has been examining how the placement of cockroach baits in a home affects control and allergens.

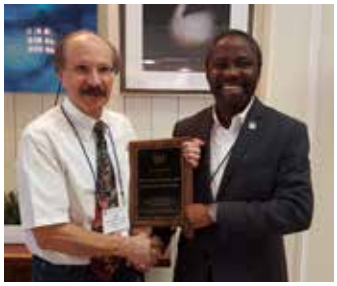
Louisiana State University student **James Villegas** won the Masters student award. Villegas has been exploring the effectiveness of silicon soil amendments on rice resistance to rice water weevil.

Past student winners have often continued their leadership in their first faculty appointment. Previous Ph.D. award winner **Adam Dale** is a prime example. Dale, who received the Ph.D. award in 2015 when he was a student at NC State University, won Future Leader award this year as an Assistant Professor at the University of Florida. He has continued his urban tree focus at the University of Florida, along with adding studies on insect pests of landscapes and turf. He built a lab that supports several students by securing over $475,000 in funding in his first two years.

NC State University entomologist **Steve Frank** won the Bright Idea award this year. For the past several years, Frank has been studying how impervious surfaces affect scale insect infestations of urban trees. Based on the results, he developed a formula called the Pace to Plant method which is is now being used internationally.

IPM Educator winner and University of Georgia professor **David Riley** has made significant contributions to international IPM through mentoring students. Riley has served as major professor for 19 graduate student programs, served on 14 other graduate student committees and advised 46 MPPPM students.

The IPM Implementer award goes to a team of area managers from Glades Crop Care. The three consultants who comprise the team—**Felicia Parks, Steve Hoak and Leon Lucas**—cover eight states plus Puerto Rico, providing scouting and management advice for whitefly, thrips and other insects. Working with Glades IPM practitioners, the team is responsible for nearly 50,000 acres of production.



Lifetime Achievement award winner **Jim Cuda** has been a stalwart proponent for biological control throughout his career. An entomologist at the University of Florida, he has used his knowledge of insects to find new predators to control…weeds. In fact, one of his most successful projects involved the biological control of tropical soda apple in pastures. Through the release of a leaf beetle, ranches in two major Florida counties have reduced or eliminated herbicide applications, and herbicide control of the plant in general has significantly decreased.

As in the past, winners will be recognized at various meetings or conferences throughout the year.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