Southern IPM Center

Southern Exposure

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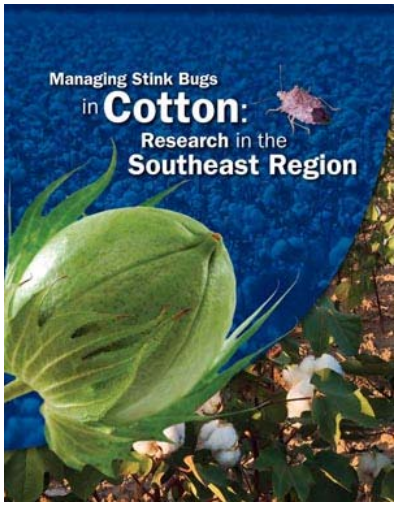
In this issue:

New Report Sheds Light on Stink Bug Management



Entomologists from the southeast US have developed new ways of approaching pest management for stink bugs. Their findings have just been published in a 16-page report, *Managing Stink Bugs in Cotton: Research in the Southeast Region*.

The report is based on a three-year research project funded by Cotton Incorporated, the Southern Region IPM Center and cotton support committees from Alabama, Florida, Georgia, North Carolina, South Carolina and Virginia. The project involved revising action thresholds, examining the impact of stink bug feeding on cotton fiber quality, studying stink bug distribution across the farmscape and assessing an alternative scouting method. Cotton Incorporated funded the printing of the report.

Project leaders from five states were involved: Ames Herbert, Virginia Tech; Eric Blinka, Monsanto; Jack Bacheler and John Van Duyn, North Carolina State University; Jeremy Greene, Clemson University; Michael Toews and Phillip Roberts, University of Georgia; and Ron Smith, Auburn University. Private consultants and local growers often assisted the scientists in locating stink bug infested fields and allowed them to conduct tests in those fields.

Scientists began their study with a series of questions:

- Do regional differences in patterns of stink bug damage exist?
- What are the relationships between stink bug damage, yield, and fiber quality?
- What is the relationship between cotton-crop stage and damage potential?
- How does the agricultural landscape impact stink bug movement?
- What sampling methods and sample sizes are most efficient for stink bug damage detection?

The team also compared species within the sucking bug complex, namely plant bugs and stink bugs, to determine which species poses a greater threat to growers.

The trials and analyses over the three-year period provided the answers. The team discovered that stink bugs pose more of a threat than plant bugs because damage symptoms indicate that stink bug populations are much higher than plant bug populations. Concerning differences in stink bug populations within the region, researchers found that brown stink bugs are common to all states, while green stink bugs populate primarily North Carolina and Virginia, and southern green stink bugs populate primarily Georgia.

With regard to thresholds, the data showed that cotton is most vulnerable to economic injury during the third to fifth week of bloom. Based on 49 field trials across the region, experts developed a "dynamic" threshold that changed by week of bloom. Insecticide

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Stink Bug Report Available (continued from previous page)

applications made by following those thresholds resulted in the highest net returns compared with the currently used "static" thresholds—from $7.00 to $34.00 per acre depending on the level of pest pressure.

Fiber quality tests showed that stink bug feeding does not reduce fiber quality when thresholds are correctly applied; however, stink bugs can reduce fiber quality when they are poorly managed.

Conclusions from two additional research areas may further improve the efficiency of stink bug management: an "external boll damage" scouting alternative and a distribution assessment of stink bug entry into a field. Examining bolls for evidence of external feeding damage may save consultants time in assessing threshold levels, and spatial assessments show that early insecticide treatments along the field perimeter may lower damage potential.

The report is available at no cost. For copies, please contact the expert in your state. If you are in a different state, contact Ames Herbert at Virginia Tech.

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Director's Notes

One of things I have always enjoyed about working in IPM is that the job always evolves. The work we do never becomes settled enough to be routine. Recent developments in IPM and here at the Southern Region IPM Center indicate yet again that – thankfully – humdrum routine is not something we have to worry about.

For instance, the ipmPIPE program continues to be in a state of flux. This project started in late 2005 with a focus on one pest – Asian soybean rust – and a budget of a little over $2 million dollars. Subsequently it grew to address other pests of soybean (soybean aphid), then entirely new pest/crop complexes (cucurbits, pecans, many legumes). Recently Dr. Bob Kemerait at the University of Georgia has led an effort to use this technology to manage Southern corn rust. The budget grew to $3.2 million then to $4.5 million, and now has subsided to about $70,000. As part of this project have managed subcontracts to universities, state agencies and businesses located in almost every state in the continental US except New England. The concept and the utility of the ipmPIPE approach remains very strong and useful, but the governmental economic support for the program has plunged. So the economic news is distressing, but at the same time challenging. Everyone involved is challenged to find ways to sustain the IPM benefits this program has produced even as

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Director's Notes (continued from previous page)

funding wanes. But I have to say – at least it won't be boring!

As some doors close (part way, at least), others open up. We have recently entered into new cooperative agreements with USDA's Agricultural Research Service to undertake three important projects that should prove interesting and useful. One is to manage and facilitate National Plant Disease Recovery System Plans, important documents for use in defending American agriculture from potentially devastating foreign plant diseases. Another is to manage production of Transition Plans, strategies for dealing with the loss of key pesticides due to registration issues. The first of these will address the loss of methyl bromide in strawberry production. Finally, we have taken on a project to assist in analyzing IPM aspects of the Natural Resources Conservation Service's (NRCS) Conservation Effects Assessment Program (CEAP), a massive multi-year survey of agricultural practices. I am also looking forward to re-energizing a Center initiative we first floated earlier this year that we're calling the Homescapes IPM project.

So, as always, life in IPM at SRIPMC is still interesting for us. We hope this newsletter and other aspects of IPM pique your interest too.

Friends of IPM Award: Southern Region School IPM Working Group

A working group of Extension specialists in school integrated pest management received a regional award during the meeting of the Southeastern Branch of the Entomological Society of America.

The Southern Region School IPM Working Group received the Friends of IPM "Bright Idea" Award from the Southern Region IPM Center. The award recognizes an innovative idea or breakthrough that makes IPM implementation easier or more effective. The group received the award for forming the first formal regional working group in the southern region.

Southern Region IPM Center Associate Director Steve Toth presented the award during the Southeastern Branch meeting of the ESA.

"This award is for the 'unsung heroes' of integrated pest management," Toth said. "The Southern Region School IPM Working Group is receiving the Friends of IPM Bright Idea Award for creating and maintaining a coordinated working group."

Left to right: Godfrey Nalyanya, Steve Toth, Vicky Bertagnolli, Lawrence "Fudd" Graham, Janet Hurley, Karen Vail, Mike Merchant (kneeling), and Dale Pollet.

The group includes School IPM specialists at each of the southern region land grant universities. Members of the group met for the first time in May 2007, after the Southern Region IPM Center invited specialists to Atlanta to share resources and discuss challenges in each state. Before that meeting, most school IPM specialists worked with the resources in their own states and were unaware of whom to contact in other states.

Each state's resources varied, from thorough manuals and innovative workshops to a few handouts and occasional visits. While some school IPM specialists dedicated their time to the schools, others balanced those

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Friends of IPM: School IPM (continued from previous page)

responsibilities with visits to farms and grower workshops. While some had built strong school IPM programs, others struggled to keep theirs afloat.

The challenge facing all of them was the goal of a newly-developed national school IPM pest management strategic plan. The plan was created to reduce pest and pesticide-related hazards to children in the U.S. public schools by 2015.

By the end of the two-day meeting, not only had everyone shared resources, but they had created a mission statement and priorities, elected a chair and secretary and begun planning a logo. The group had two main goals: to enhance the existing programs in each state and to assist programs that were struggling to change school pest management practices in their states.

“There’s no way we’re going to meet the national PMSP goal of school IPM implementation by 2015 if we don’t all work together,” said Janet Hurley, School IPM specialist from Texas A&M University.

The initial group included Lawrence “Fudd” Graham and Vicky Bertagnolli (now at Clemson University), Auburn University; Faith Oi and Rebecca Baldwin, University of Florida; Jim Criswell and Tom Royer, Oklahoma State University; Leslie Godfrey, Clemson University; John Hopkins, University of Arkansas; Janet Hurley and Mike Merchant, Texas AgriLife Extension; Dale Pollet and Dennis Ring, LSU AgCenter; Godfrey Nalyanya, North Carolina State University; Karen Vail, Tennessee State University; Bill Witt, University of Kentucky; Tom Green, IPM Institute; Herb Bolton, USDA; and Mike Page, Florida Department of Agriculture & Consumer Services. The group has since expanded to include representatives from all of the southern Land Grant universities, industry representatives, Environmental Protection Agency and US Department of Agriculture specialists, the Association of School Business Officials, the National School Plant Management Association, the National Pest Management Association, some non-profits, and representatives from school IPM working groups in the other regions.

Since the 2007 meeting, the working group has applied for and received several grants. Graham, Oi and Baldwin received a grant from eXtension to host a national School IPM website. A National Extension Integrated Pest Management Special Projects grant funded a two-day green building workshop in Dallas, Texas, and presentations at several national and regional meetings of school business officials and school plant managers. An Environmental Protection Agency Pesticide Registration Improvement Renewal Act (PRIA) grant is funding workshops in Louisiana and North Carolina. Participants of the workshops will learn how to scout their schools for pests and how to address pest problems.

The group is also adapting training materials from several states for regional use and translating them into Spanish.

Friends of IPM Award Nominations Due November 6

For more information about the award and how to apply, visit http://www.sripmc.org/friendaward2010/.

Submit nominations to Rosemary Hallberg at rhallberg@sripmc.org

Growers and University Researchers Discuss Pest Management for Nursery Crops

Phytophthora ramorum is a tragedy in the forest. In a nursery, it's deadly. So when a group of ornamental growers, university researchers, Extension professionals, and others in the nursery industry met together to talk about the most serious pests, *P. ramorum* (cause of sudden oak death) was at the top of the list.

The list of primary pests will be part of a new document called a "pest management strategic plan." Pest management strategic plans are usually commodity-driven, listing primary insects, weeds and diseases, ways to control them, pest management challenges, and ways that researchers, educators and regulatory agencies can help the industry.

To facilitate dialog and create content for the plan, growers and others met during a pest management strategic planning workshop at the Mountain Horticultural Crops Research & Extension Center in Mills River, North Carolina in late July. Participants represented the woody plant ornamental industry from five southeastern states as well as the land grant university faculty charged with helping the nursery industry.

When asked about their use of integrated pest management, many growers expressed frustration about consumer expectations for the "perfect" plant. Growers shared their desires and efforts to reduce the amount of pesticides they use, but felt consumer expectations made that challenging.

Integrated pest management includes pesticides as part of a package of pest management strategies but does not rely solely on the use of pesticides to control pests.

"We try not to spray any more than we have to," said one grower. Others added that they focus their pest management efforts only on the plants they are selling that year.

Growers face yearly battles with insect pests. Of all of the insects that growers face, scale, borers, and mites are the hardest to control. Many growers requested information on how they can implement IPM methods efficiently and profitably to control those pests.

Growers listed *P. ramorum* as the worst disease. Although some growers chlorinate their irrigation water to prevent Phytophthora diseases including *P. ramorum*, the treatment is expensive, and growers with smaller nurseries often can't afford to treat their water. Growers asked researchers for more information on ways to sanitize water that controls diseases caused by pathogens like *P. ramorum*.

The biggest weed problems in nurseries? That depends on the nursery. In field production it is nutsedge – a perennial weed that is not controlled well by most herbicides labeled for use in nurseries and is spread by cultivation. Container nurseries have very different weed populations, with spurge and bittercress being the dominant (and most costly) species. One central theme from growers was a desire to have more cost-effective weed management

The group discusses their thoughts on the PMSP during a barbecue lunch at the end of the meeting.

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Nursery Crops PMSP (continued from previous page)

options – using knowledge and new technologies such as greater longevity of residual control, more postemergence options, and access to better tools and decision aids.

Amy Fulcher, Extension Associate from the University of Kentucky, said the plan that will result from the discussions at the meeting will be a good resource for the nursery crop industry. The research and Extension attendees recently formed a collaborative working group to design and implement strategies that control pests by using IPM.

"We now have a comprehensive needs assessment and a clearly defined set of priorities about how to advance pest management for Southeastern nursery growers," she said.

Nursery Crops PMSP: Priorities for the Industry

Insect Issues

Most Important Insects:

- Boring insects (Clearwing and Flatheaded Borers, Granulate Ambrosia Beetle)
- Scale
- Mites

Research Needs for Insect Pests:

- Influence of production practices on insect outbreaks and complexes.
- New, beneficial-friendly insecticides.
- Biology of granulate ambrosia beetle, mites, and armored scales, including white peach and Japanese maple scales.
- Practices to manage the pest complexes to consolidate insecticide applications

Extension Needs for Insect Pests:

- Develop monitoring techniques and thresholds.
- Organize scales into groups and give control based on the group.
- Education on the effects of stress and production practices on insect problems.

Disease Issues

Most Important Diseases:

- *Phytophthora ramorum*
- Phytophthora root rots, as well as Rhizoctonia and Pythium root rots
- Downy mildew
- Powdery mildew
- Leaf spots

Research Needs for Diseases:

- Chlorination and use of hydrogen peroxide in irrigation water.
- Field diagnostics for bacterial and fungal diseases.
- Relationship between irrigation, fertilization and diseases.
- Systemic drench for dogwood powdery mildew.

Extension Needs for Diseases:

- Efficacy tables for various fungicides/diseases, distinguish between curative and preventative.

Weed Issues

Most Important Weeds:

- Spurge
- Bittercress
- Yellow nutsedge
- Horseweed (glyphosate resistant)
- Crabgrass

Research Needs for Weeds:

- Technologies for extended longevity of weed control.
- Selective weed management options.
- Cost analysis of weed management options and systems.

Extension Needs for Weeds:

- Develop economic thresholds.
- Education on herbicide-resistant weeds.
- Education on avoiding crop damage from herbicides.

Overall Needs

A few overall needs that were identified at the meeting are listed below:

- Increase public awareness of resistant cultivars.
- Increase public awareness of cosmetic vs. health-threatening pest problems.
- A regional website and/or manual with cultural and pest control information.
- Research on cost-effective IPM systems.
- Pest ID and management resource development.
- Advance electronic ID/ diagnosis tools.

ipmPIPE Update

Overview:

The ipmPIPE continues without any assurance of new funding for the future. Operations for 2009 have been covered by a combination of previously allotted Federal funds, Soybean Check-off funding, state-level funding by grower associations, and in-kind contributions by land grant universities.

Funding in hand:

A series of 3 tripartite agreements among USDA-RMA, USDA_NIFA (formerly CSREES) and North Carolina State University originally supported all aspects of the ipmPIPE. Starting in September 2005, the first of these projects ($2.2m) ended in March of 2008.

The second project ($3.2m), begun in September 2006, terminated September 2009. We used the last remnants of funds to provide a few months of IT and programming support.

The third agreement ($4.6 m) was initiated in September 2007.

- Funds for general IT and programming support from this agreement have been exhausted.
- Remnant funds from subcontracts to state Extension specialists for soybean rust (SBR) were reconfigured after the 2008 growing season to support to concentrate SBR monitoring in critical southern (Tier 1) and mid-south (Tier 2) states. These funds will be exhausted by December 2009.
- Remnant funds for Soybean Aphid (SBA) were reconfigured to provide monitoring in key SBA states in 2009. These funds will be exhausted by December 2009.
- The Cucurbit Downy Mildew (CDM) component was entirely funded through a competitive process with these funds. It continues for another year but its budget does not include support for field monitoring in 2010.
- The pecan nut casebearer component was funded at approximately half of the original request through a competitive process with these funds. It continues for another year. This project received some additional support from RMA funds in 2009 to address elements of the reduced initial funding.

For several years the Soybean Check-off (United Soybean Board and North Central Soybean Research Program) has provided significant funding to support SBR monitoring – min 2009, $364,000. This is currently only identified source of funding to support a national SBR monitoring project in 2010. These grower Check-off sources have tentatively committed to fund the SBR monitoring program again in 2010, but that decision and the level of support will not be confirmed until mid-December.

USDA-NIFA provided about $175,000 for IT and programming and expects to continue that support in 2010.

USDA-RMA allotted $500,000 that was finally distributed by USDA in September. Most of these funds will pay for 2009 (that is correct, 2009) monitoring for the legume component, with state contracts managed by Rick Melnicoe at UC Davis (WIPMC). A small amount - $70,000 – is slated for communications and other coordination through 2010 and will be managed by Jim VanKirk at NCSU (SRIPMC). The remainder will be used for programming and IT. We have received no encouragement to expect further RMA funding.

New Federal Funding:

We have no expectation of new RMA funding.

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ipmPIPE Update (continued)

USDA-NIFA expects to be able to fund support of IT and programming at a significantly reduced level from previous years, but comparable to 2009.

No funds are explicitly mentioned for ipmPIPE in the budgets passed by the House and Senate Appropriations Committees for the next fiscal year. Both of these do include significantly increased funding for AFRI, along with possible increased requirement for use in extension or integrated projects. This offers some hope for applicability to ipmPIPE.

Components:

SBR: Sustainability continues to be an issue in light of declining USDA funding. At the NCERA 208 meeting in September, the group agreed to submit a proposal to the Soybean Check-off to support monitoring in Tier 1 states where the pathogen overwinters. They expect that this will be supplemented with state grower association funds in many states. Monitoring in Tier 2 and Tier 3 states will receive no support from the national program and are entirely dependent upon state grower associations and other support mechanisms. These adjustments all are relate not only to decreasing national funds but also to greater emphasis on predictive models and regional spore trapping finds.

SBA: The SBA component has proven useful to entomologists in many states and through them to growers. Leadership of this component including the S1039, Biology, impact, and management of soybean insect pests in soybean production systems multi-state committee has begun to consider ways to effectively wind this ipmPIPE component down. No future funding has been identified.

Legume: The 2009 season was covered by the most recent USDA-RMA funds. Proposals for funding from SCRI were unsuccessful in both 2008 and 2009. No new funding for 2010 and beyond has been identified.

CDM: The CDM PIPE has been very successful at developing a network and presenting information online in new and innovative ways. Leadership is pursuing sustainable funding, perhaps to include proposal submissions to one or more RFAs.

The original plan for this component did not include funding to support field monitoring in 2010, and no such funding has been identified yet. The current plan is to use research and other plots voluntarily monitored by collaborators and cooperators.

Pecan: The Pecan PIPE has made significant strides in developing and providing an information network addressing the key insect pest pecan nut casebearer. Recently the team has considered integrating pecan scab information. The project was funded at a significant reduced amount from the original proposal and has since added $45,000 from the most recent RMA outlay.

Southern corn rust (NEW). Bob Kemerait (UGA) has spearheaded an effort to present the Southern corn rust (*Puccinia polysora*) ipmPIPE. He was able to use state funds to pay for initial web design, etc. with ZedX, and is currently recruiting other state specialists.

NCipmPIPE (NEW): Darren Meuller of Iowa State reports success with a 2-year, $50,000 grant from EPA for the North Central ipmPIPE. Mike Greifenkamp (University of Illinois) will provide web design, management, etc. At the start the project will focus on Western bean cutworm, black cutworm, and possibly soybean aphid.

UF Researchers Explore the Use of Buckwheat as a Cover Crop in the South

If buckwheat had a nickname, it would be the "do-it-all crop." Since colonial times, it has been milled into flour for nutritious breakfast foods and pasta. In the mid 1960s buckwheat dwindled as a crop, but a health-conscious public created a new demand for it by the next decade. Beekeepers sometimes use buckwheat to produce honey.

Pei-wen Huang measuring photosynthetic active radiation with an Accu-PAR LP-80 Ceptometer in 2 week-old buckwheat.

In many northern and Midwestern states, farmers use it as a cover crop to prevent weeds from overtaking a fallow field between field crops. Rapid foliar canopy establishment and chemical properties make it an excellent option for weed suppression for organic farmers, often limited in terms of weed control. Buckwheat's advantages as a cover crop enticed University of Florida researcher Carlene Chase to experiment with its use as a cover crop in the Southeast.

In the North and Midwest, cool springs and mild summers give buckwheat an ideal growing season, since buckwheat grows best in temperatures ranging from 60 to 85 degrees Fahrenheit (EF). Southern growers, however, have not traditionally grown buckwheat. In southeastern states, temperatures can dip into the 40s in the winter and hover near 100EF in the summer, limiting the growing season for buckwheat. Located at the University of Florida in Gainesville, Chase wanted to determine if Florida growers could use buckwheat as a cover crop, when they would need to plant it for optimum weed control, and how they would need to terminate the crop to benefit from its allelopathic qualities.

Working with University of Florida master's student Pei-wen Huang, Chase selected several dates for seed planting at the University's Plant Science Research and Education Unit in Citra. Spring planting dates ranged from late February to late May, while fall planting dates began in late September and ended in early December. For comparison, Huang also maintained weedy control plots and plots that were kept weed-free by occasional tillage.

Buckwheat beginning to flower at 4 weeks after planting.

To determine which planting date was optimal, Huang measured plant height, canopy closure, and shoot dry weight for each buckwheat crop. She also compared weed infestation in the buckwheat cover crops with that occurring in weedy control plots. At 5 weeks after planting buckwheat, weedy, and weed-free plots were all tilled in the manner of preparing a seedbed and the regrowth of weeds was compared in the three types of plots.

After repeating the trials for a second year, Huang concluded that the best planting dates for buckwheat were May 1 and October 16. Early spring and late fall proved too cold for maximum growth, and late spring and early summer were too hot.

Unfortunately for Florida growers spring- and fall-planted vegetables are still in the field during the optimal planting windows for buckwheat. Growers who plant a variety of crops and establish those crops at different times during the spring and fall may find it useful to use buckwheat as a short term cover crop. Alternatively, growers may want to use buckwheat in mixtures with other cover crops during less optimal growing conditions. Dr. Xin Zhao, Chase's colleague in the Horticultural Sciences Department has observed a grower using buckwheat intercropped with sorghum sudangrass during summer. A summer cover crop like sorghum sudangrass has a longer cover cropping prospect.

Chase and Huang also tested nonchemical methods to kill the buckwheat crop. These methods included rolling over it with a drum roller, mowing it with a flail mower, lightly tilling it into the ground, and a combination of flail mowing followed by light tillage. More than

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IPM at Work (continued)

90% of the buckwheat was killed by these practices.

"Rolling and flail mowing can be favorable practices in spring or for no-till cropping systems to provide organic mulch, although the mulch generated by rolling persists longer than that produced by flail mowing," Huang writes in her thesis. Huang hypothesizes that the mulch created by the flattened buckwheat and the chopped buckwheat residue that results from flail mowing can suppress weeds that are stimulated to germinate by light and chemically suppress other weeds through allelopathy, respectively.

Buckwheat planted at 50 lb/acre on Apr. 10, 2007; photo taken at 4 weeks after planting.

Weeds within the buckwheat crop were not as effectively killed by rolling and flail mowing and tended to regrow. Light tillage alone and flail mowing plus tillage effectively killed both buckwheat and weeds. However, light tillage may be more useful in fall since it stimulated weed seed germination when used in spring and the cooler fall temperatures may help to inhibit weed emergence.

Although buckwheat proved to be an effective weed control alternative, Huang concludes that the seasonal limits imposed by Florida's weather may restrict its uses as a cover crop for weed management but not preclude it from use in sustainable farming practices.

"Even though hot weather in Florida is not appropriate for buckwheat growth and reduces the effectiveness of buckwheat for weed suppression, buckwheat may still play a role in sustainable cropping systems by providing ecosystem services such as nectar sources for beneficial insects, phosphorus, organic matter, and short-term soil cover for neighboring or subsequent crops," she writes.

Publications and Events

October 6-7, 2009: National IPM Committee meeting, Washington, DC

October 7-8, 2009: IPM Coordinating Committee (IPM Center Directors) meeting, Washington, DC

October 13, 2009: From Research to Implementation to Impact, 3 PM ET (second training teleconference for IPM Programs, sponsored by USDA)

November 6, 2009: Deadline for Friends of IPM Nominations

November 9-10, 2009: Southern IPM Center Advisory Council / Steering Committee meetings

Publications

Managing Stink Bugs in Cotton: Research in the Southeast Region. For copies, see page 2.

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