

Department of *Entomology* NEWS

Fall 2008

From the Department Head



Tim Schowalter

The Entomology Department at Louisiana State University and the LSU AgCenter is gaining recognition for its research productivity, involvement in classroom instruction and engagement with stakeholders. We also continue to overcome disruption of programs by hurricanes (most recently Gustav and Ike)."

Major research discoveries by our faculty during the past year include identification of pheromones produced by soldier termites that regulate caste organization in termite colonies, identification of molecular markers for identification of termite colony membership, assessment of the impact of red imported fire ants on the predator guild in sugarcane fields and experimental control of sand fly larvae by means of toxic rodent feces passed through the gut as insecticide-laced rodent bait. Major funding was acquired from the Department of Defense (DoD) for continued work on control of sand fly vectors of leishmaniasis (Lane Foil and colleagues with the LSU Vet School, \$735,000) and for multistate research on post-harvest rice pest management (Gene Reagan and colleagues with Texas A&M University and USDA-ARS, \$610,000).

(Continued on page 2)



Dr. Natalie Hummel speaks at a press conference in Plaquemines Parish about the Citrus Psyllid. She was joined at the podium by Louisiana Agriculture Commissioner Mike Strain. Plaquemines Parish President Billy Nungesser and Plaquemines Parish Sheriff Jiff Hingle are also at the table.

Asian citrus psyllid discovered in Louisiana

The Asian citrus psyllid was discovered in south Louisiana in June 2008. This insect is known to transmit greening disease, which could cause significant damage to Louisiana's citrus industry. The first infected tree in the state was discovered and diagnosed in a backyard in Orleans Parish. That tree was destroyed by Louisiana Department of Agriculture and Forestry. This insect and disease have been a serious problem for citrus producers in Florida for several years (the insect since 1998, the disease since 2000). Texas also has the psyllid, but not the disease. There currently is no treatment for the disease, so management options must focus on the psyllid.

Natalie Hummel, our extension specialist responsible for fruit tree entomology, has been proactive in addressing this situation, especially providing agent training in identification and treatment, since the insect and disease apparently were discovered at an early stage of establishment. She has worked with commercial growers as well as par-

ish, state and federal officials to develop an aggressive plan of action to keep the psyllid populations low to prevent widespread occurrence of the greening disease. The predominance of urban ornamental citrus in the southern part of Louisiana, however, presents a special challenge since there are no pesticides available to homeowners for this insect on citrus.

Since the first infestation was discovered, the Louisiana Department of Agriculture and Forestry and the U.S. Department of Agriculture, the regulatory agencies for this type of pest, have begun surveying citrus trees from across southern Louisiana to determine the extent of the problem. The insect has now been confirmed in Jefferson, Lafourche, Orleans, Plaquemines, St. Charles, St. James, St. Tammany and Terrebonne parishes, and no additional trees infected with the disease have been found. A quarantine has been placed on citrus trees moving out of the affected areas of the state.

Sugarcane Entomology

Sugarcane and rice generate more than \$2.5 billion for Texas and Louisiana growers, but these commodities are vulnerable to effects of storms on coastal agroecosystems, to new invasive species, such as the Mexican rice borer and to restrictions on insecticides available for control of current pests, such as the sugarcane borer. LSU AgCenter and Texas A&M researchers have developed a proactive integrated pest management program to control stalk borer populations in rice and sugarcane.

Mexican Rice Borer

A new \$215,390 grant Gene Reagan's project received this summer from the USDA (CSREES) Crops-at-Risk program emphasizes collaborative research efforts on the Mexican rice borer with Texas A&M scientists. These studies supporting the training of several graduate students have brought in more than \$1.4 million in competitive grant funds since 2002. Two Crops-at-Risk grants, two grants from the EPA Strategic Agricultural Initiative, several USDA IPM programs to develop pest-resistant varieties and a more timely use of environmentally friendly insecticides have contributed to the proactive program of IPM in sugarcane and rice.

Mexican rice borer first detection in Louisiana sugarcane and rice is expected by 2009. Estimates obtained from former Ph.D. student Dr. Francis Reay-Jones from research with Texas A&M scientists indicate that annual losses of \$220 million will be expected with current varieties and cultural practices when the whole Louisiana sugarcane crop becomes infested. The current work of Ph.D. student Julien Beuzelin addresses the potential for manipulation of noncrop (weed) hosts and late-season cultural practices for enhancing Mexican rice borer IPM.

From the Department Head

(Continued from page 1)

Research and extension faculty have been active in preparing the state for several invasive pests, by providing likely timetables to introduction and evaluating potential impacts and control measures. Regular e-mail alerts on seasonal or new appearance of insects are sent to extension agents to help them inform constituents. The recent appearance of the panicle rice mite and the Asian citrus psyllid (and its vectored citrus greening disease) have generated considerable demand for information from our faculty on biology and control options.

The department has taken responsibility for teaching a major College of Agriculture course, Science and Society (AGRI 1005) and increased enrollment from an average of 75 to more than 170 students each semester. We also have increased enrollment in our Urban Entomology and Agricultural Pest Management Concentration areas.

Our faculty have developed extensive networks of collaboration nationally and internationally. We have had good participation in professional meetings and activities, including the recent International Congress of Entomology in Durban, South Africa. We also have strong connection with our statewide network of extension agents and commodity producers. Feedback received from stakeholder groups continues to demonstrate that our department sets

the standard for engagement with constituents around the state. Strong advocacy among our stakeholder groups has helped us to fill three important positions in the department during the past year. Future staffing priorities include an insect physiologist and an aquatic entomologist.

We continue to seek financial support to invite distinguished lecturers and other outside speakers who augment the value of our graduate education, travel grants to permit students to attend scientific meetings, our Louisiana State Arthropod Museum and, of course, our stipends for exceptional graduate students. Your support for these and other departmental programs are greatly appreciated.

Please contact me at 225-578-1634 or tschowalter@agcenter.lsu.edu if you have questions or suggestions, would like to visit the department or use our services or would like to support departmental programs. For your convenience, an insert is enclosed, with options for you to check if you would like to contribute to the department or update your contact information. We appreciate the support of all our donors and supporters, always enjoy hearing from you and welcome an opportunity to see you if you visit our campus.

Sincerely,
Tim Schowalter
Professor and Head



African honeybee (Hluhluwe National Park, South Africa)

Panicle Rice Mite

Natalie Hummel

During the summer of 2007, rice research greenhouses and a limited number of fields in Arkansas, Louisiana and Texas, were found to be infested by the panicle rice mite, *Steatotarsonemus spinki* Smiley. This included one commercial field in Vermilion Parish that was infested with both PRM and bacterial panicle blight. Currently, the PRM is present in nearly all rice producing regions of the world. In the tropical climate of the Caribbean, it has caused the most significant crop losses. Fortunately, the damage from this mite can be minimized by variety development and proper management.

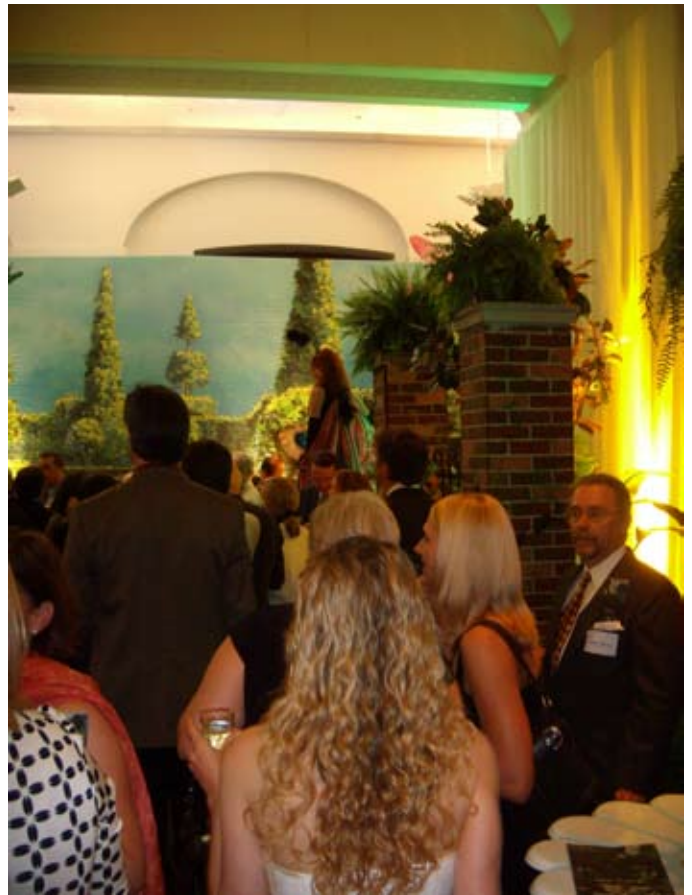
PRM are clear to straw-colored and approximately 250 μm (1/100 of an inch) in length so the must be scouted for with a hand lens. Male PRM have elongated rear legs containing a pair of elongated spines. The legs are carried above the body. Female PRM are ovoid. Larval stages are about half the size of adults. Eggs are also about one-third the size of adults. The PRM is parthenogenetic, which means that virgin females can produce male offspring. The female will then mate with these male offspring and produce eggs. A mated female PRM can produce an average of 55 eggs in her lifetime. The lifecycle in the laboratory can vary from three days at 86 degrees to 20 days at 68 degrees. When held in the laboratory at 17.6 degrees for 72 hours, all PRM died.

Panicle rice mites cause damage to plants directly by both feeding on leaf tissue in the leaf sheath and developing grains at the milk stage and indirectly by transmitting fungal pathogens such as sheath rot and bacterial panicle blight. PRM can carry sheath rot spores on their body. It is thought that feeding by the mites causes damages to plant tissue, which may facilitate entry of fungal pathogens into developing grains and the leaf sheath. Damage to grains can result in sterility and deformed grains, parrot-beaking of grains and straight-head type symptoms. Damage to the leaf sheath may decrease yield. Research is needed to determine how much damage is caused directly by PRM feeding and how much is caused by PRM associated with disease.

Scout for PRM by looking for the symptoms associated with bacterial panicle blight and sheath rot. In affected plants, look for a cinnamon, yellow or chocolate-brown discolored lesion on the leaf sheath that do not have a distinct edge. To find mites, pull the leaf sheath back and examine the underside of the leaf sheath with a minimum 20X hand lens. The PRM feeds on the plant material on the inside of the flag leaf sheath. Once a new leaf begins to develop, a female PRM will move to the new leaf sheath, produce male offspring and establish a new feeding lesion. Thus, damage will often be observed on inner sheaths when the outer sheath is removed. This continues until the PRM reaches the leaf nearest the stem. They also feed on developing panicles.

High temperatures and low amounts of rainfall are favorable for developing large populations of PRM in the field. Continuous rice culture, as well as the sharing of equipment between infected and uninfected fields, is also conducive to building economically damaging populations of PRM. The PRM can be spread to other fields by: (1) people, equipment and other insects; (2) irrigation water; and (3) wind.

LSU AgCenter staff are exploring options to best manage this pest. Contact your county agent if you suspect that this mite may be present in your field and to obtain the latest information on this pest.



LSU entomology alumnus Erin Watson (Ph.D. '04) and Chris Carlton (pictured) were among several faculty members and staff who attended the opening of the Audubon Nature Institute's Insectarium in New Orleans.

Predator ecology

Gene Reagan, Ph.D. student Julien Beuzelin and county agents Howard Cormier and Jimmy Flanagan conducted a study in 2006 showing that storm surge flooding in St. Mary, Iberia and Vermilion parishes from Hurricane Rita caused numerous changes among arthropod complexes in sugarcane. The weather-related 2.8-fold reduction in the predaceous red imported fire ant allowed for a greater diversity of soil-associated arthropods. Growers incurred higher injury, however, even with a 2.4-fold increase in the frequency of insecticide applications used in previously flooded fields. The disrupted insect pest management balance associated with the storm surge caused an estimated loss in revenue between \$1.9 and \$2.6 million to the Louisiana sugarcane industry for the 2006 production season. Although some fields in Vermilion parish showed a continued impact from the hurricane during the spring of 2007, the pest management system was characterized as recovering.

2008 Status of French Quarter Formosan termite management

Alan Morgan, Dennis Ring

The Formosan subterranean termite (*Coptotermes formosanus* Shiraki) was first discovered in New Orleans in 1966 and has caused serious losses in the New Orleans area for 30 years. It is a devastating pest in several parishes with estimates of losses reaching \$300,000,000 in the New Orleans area and \$500,000,000 in Louisiana. Losses include the collapse and demolition of structures and defaults on loans. This termite will eat the center of creosote-treated wood and attack live trees.

An areawide management program for the termite was begun in the French Quarter in 1998. The goal was to reduce densities of termites and validate the effectiveness of areawide management. The program is one part of the national Formosan subterranean termite management program and it is a cooperative program among the LSU AgCenter, the Agricultural Research Service and the New Orleans Mosquito and Termite Control Board.

A 15-block area of the French Quarter was treated with nonrepel-

lent termiticides or baits. Licensed pest management professionals applied the treatments. The remainder of the French Quarter was not treated by the program but was monitored to provide a comparison to the treated area.

Sticky traps were placed within two meters of lamps on light poles in 46 locations in 1998, 1999 and 2000. One sticky trap was put on every corner of the 15-block test area. The remaining 22 traps were placed in the untreated area. From 2001 to 2006, sticky cards were placed on all corners of the French Quarter area, adding 56 sites in the untreated area. Sticky traps were replaced twice a week in May and June.

The number of alates (winged adult termites) on each sticky trap was determined. In-ground monitoring stations were placed in contact with the soil using holes drilled through the sidewalk to monitor termite foraging activity. Twelve stations were placed at regular intervals around each block in the 15-block area with 44 additional stations placed outside the test area.

In January of 2002, an additional 300 stations were placed outside of the test area. Stations were sampled monthly and the presence or absence of termites was recorded. The treated area was expanded in 2002, 2003, 2006 and 2007.

The data showed that areawide management reduced termite activity in area 1 by 75 percent. A reduction in the number of alates was observed in other areas within two years of treatment. The number of alates decreased in most of the areas in 2006 following Hurricane Katrina. The decrease in alate numbers in 2006 could possibly be due to the severe drought in the area. Another possible reason might be the decreased FST population along the levy area of the French Quarter.

A 50 percent reduction in the number of in-ground monitoring stations with termites was observed in area 1. Many of the stations with termites were around the Wildlife and Fisheries building. This building has been under renovation through the duration of the program and has not been treated.

Isolated areas of "high" termite activity remain inside the test area. Inspections of properties using infrared technology are being conducted to allow discovery and treatment of colonies which have, so far, escaped treatment. Visual inspections of courtyards and trees are being conducted to detect and treat termites in the treated area outside of structures. A fourth expansion began in June of 2006 and a fifth expansion began in September of 2007. Continued treatment, expansion and monitoring are required to assess the long-term effects of the areawide management program.



Josh Temple, Jeffrey Davis and Gene Burris watch Roger Leonard address farmers at the Northeast Field Day in St. Joseph.

Entomology Club

The Entomology Club had a good year in 2007-2008. We regained official Student Organization status with the university, complete with an updated constitution.

Our first order of business was to put a face on the club with a new logo. A contest was held with more than a dozen entries from students, staff and even faculty (thanks Dr. Gregg Henderson). The winning logo was by Anna Beuzelin of an entomologically inclined ant and was the center piece of our T-Shirts. The runner-up logo was a collaboration between Katherine Parys and Mike Ferro of a butterfly with a hometown twist and can be found on our mugs.

In early November, Matt Gimmel, Katherine Parys, Lee Eisenberg and Mike Ferro organized and presented a booth on insects at the Kids Fun Day at the Block and Bridle Rodeo. The children enjoyed the "bugs," and most parents were coaxed into admitting they liked them too.

The fall cookout was held at the LSU Burden Center on November 30. More than 60 faculty, students and staff attended. Excellent food was provided hot off the grill along with a wonderful array of side dishes (the international food was especially appreciated). Fun was had by all. Many thanks to Katherine Parys and Lee Eisenberg and all the others who helped and contributed.

In early January, the club went to prison. Stephanie Gill, Matt Gimmel and Mike Ferro visited the Louisiana Correctional Institute for Women to give a three-hour presentation on entomology and insects in general, complete with drawers of pinned specimens and handouts. A more pleasant, attentive, respectful and curious audience has never been encountered.

In February, Poornima Jayasimha and Katherine Parys braved an onslaught of kindergarteners at Brusly Elementary School and gave a half-hour presentation on why bugs aren't icky (among other things).

Finally, the club hosted the annual spring crawfish boil on April 12. Dr. Tim and Cathy Schowalter donated their house for the festivities. About 70 students, faculty and staff attended, and a fun time was had by all (even by those

International activity

A number of faculty participated in international activities during 2008. Linda Hooper-Búi, Claudia Husseneder, Alan Morgan, Dennis Ring, Tim Schowalter and Mike Stout participated in the International Congress of Entomology in Durban, South Africa, July 6-12. The meeting provided opportunity to interact with international colleagues on crop protection, forest entomology, insect ecology, termite control and social insect behavior and control, among other topics. Departmental materials were distributed to encourage students to apply to graduate programs in the LSU AgCenter Department of Entomology. LSU and African entomologists share interests in biocontrol, urban entomology, medical/veterinary entomology and pest management in forests, sugarcane, rice, sweet potatoes/yams, sorghum and other grains, providing opportunities for collaboration.

Chris Carlton traveled in New Zealand and France during his sabbatical. He and Ph.D. student Matt Gimmel also received an award to work in the Natural History Museum in Paris. Carlton, Gimmel, LSAM Curator Victoria Bayless and Ph.D. student Mike Ferro spent three weeks collecting insects in Ecuador. Claudia Husseneder returned to the People's Republic of China to collect Formosan subterranean termites for genetic analysis of population relatedness.

that ate way too much!). Mike Becker, Van Hilbun, and Lee Eisenberg were in charge of the feast, and all three can cook a mean crawfish!

Looking to the future, the club is working to create more avenues to promote a broad understanding of entomology among its members and the public and to promote the welfare of the Entomology Department. We're planning to foster a stronger graduate student community through poster and oral presentation contests and

small research and travel grants (funding permitted) based on competitive reviews. Encouragement and donations are always welcome!

Certainly many more people than those named were involved in all the events mentioned above. Many thanks to all who helped out, and I hope 2008-2009 is just as good. Entomology Club officers for the 2007-2008 year were president Mike Ferro, vice president Jason Hamm, treasurer Katherine Parys and secretary Poornima Jayasimha.



Graduate students Katherine Parys and Poornima Jayasimha show kindergarten students at Brusly Elementary various types of insects.

Department News

Recognition and Awards

Department faculty have been widely recognized professionally with selection for editorships, elected offices, committees and awards.



Linda Hooper-Búi



Gene Reagan



Lane Foil

Editorships

Linda Hooper-Búi:
associate editor, *Agricultural and Urban Entomology*

Lane Foil:
editor, *Journal of Medical Entomology*

Seth Johnson:
associate editor, *Environmental Entomology*

Wayne Kramer:
editor, *Wingbeats*

Jim Ottea:
associate editor, *Journal of Insect Science and Archives of Insect Biochemistry and Physiology*

Gene Reagan:
associate editor, *Environmental Entomology*

Tim Schowalter:
associate editor, *Frontiers in Ecology and the Environment and Population Ecology*

Mike Stout:
associate editor, *Open Entomology Journal and Entomologia Experimentalis et Applicata*



Seth Johnson



Wayne Kramer



Jim Ottea

Offices

Wayne Kramer:
nominee for vice president of the American Mosquito Control Association

Roger Leonard:
chair, ESA-SEB member awards committee

Gene Reagan:
faculty adviser to the ESA student affairs committee

Dennis Ring:
program vice chair, 2007 Rocky Mountain Entomology Conference

Tim Schowalter:
chair-elect, Council of Entomology Department Administrators

Committees

Dorothy Prowell:
LSU chancellor search committee

Gene Reagan:
LSU graduate school dean search committee



Tim Schowalter



Mike Stout



Roger Leonard



Dennis Ring

Awards

Gene Reagan:

2008 College of Agriculture Sedberry Outstanding Graduate Teaching Award.

Tim Schowalter:

2008 Extension Specialist Award from 4-H University, Louisiana Cooperative Extension Service.

Kay Schweinefus (entomology office administrator): first LSU AgCenter employee to be selected to participate in the 2008 LSU LEAD-EMERGE Leadership Program, designed to enhance leadership skills among professional staff.

Don Henne:

Received the Distinguished Dissertation nomination from the College of Agriculture.

New Faculty

Jeremy Allison joined the department Aug 1, 2008 as an assistant professor with responsibility for research and instruction on forest insect biology and management. He plans to pursue research on chemical ecology of forest insects with emphasis on identification of pheromones that may be useful for population management. He also will teach the entomology portion of ENTM 4018, Forest Insects and Diseases. Dr. Allison received his Ph.D. from the University of California-Riverside, followed by a postdoc at the University of Kentucky prior to joining our department.

Retirement

James Fuxa retired Feb. 29, 2008 after 30 years with the department. Dr. Fuxa built an internationally-recognized program in insect pathology at LSU and served twice as interim head of the department.



Kay Schweinefus



Jeremy Allison



James Fuxa



Hurricane Gustav (9/1/08)

Once more a hurricane seriously affected the department. Hurricane Gustav hit Baton Rouge directly on Sept 1, 2008, toppling trees, stripping roofing and disrupting power. High winds and heavy rain caused serious damage as far north as the Macon Ridge Research Station. Hurricane Ike, making landfall the next week, blew down weakened trees and branches in Baton Rouge and caused additional losses at field stations.

The department lost about \$23,000 worth of reagents, primarily due to power failure to ultra-low freezers. Some water damage resulted from rain forced through "sealed" windows and vents and pooled on counters and floors. Damaged field equipment represented additional losses. However, major and irreplaceable damage was done to many experiments as a result of destruction of field plots and colonies in environmental chambers. Power was restored to campus within a few days, but faculty and staff were not allowed back in buildings until Sept 8, when most of the interior damage was discovered.

In addition, several departmental faculty had homes damaged by fallen trees and more suffered roof damage from shingle loss. If departmental faculty were representative of Baton Rouge, 15-20% of homes were damaged by fallen trees, and an additional 30% suffered serious roof damage. Fallen trees blocked roads and hindered replacement of power poles and lines for more than a week after the storm. Generator noise replaced the usual summer songs of insects for 2-3 weeks in many parts of town. As of this printing, many parts of Baton Rouge still have large piles of woody debris (including material infested with Formosan subterranean termites) along roadsides, awaiting removal.

Although painful, the storm also provides opportunities to study insect responses to such events. For example, some forest insects should respond positively to the increased availability of woody debris and early successional vegetation, whereas other insects likely will decline in abundance as a result of canopy opening and increased exposure. Coastal storm surge is likely to affect the abundances of insects in rice and sugarcane fields, as shown following Hurricanes Katrina and Rita in 2005. Departmental faculty will be addressing these insect responses. Stay tuned...

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NEWS

Department of Entomology
Louisiana State University
Baton Rouge, LA 70803-6200

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Department of Entomology
Timothy D. Schowalter, Head
404 Life Sciences Building
Louisiana State University
Baton Rouge, LA 70803
tschowalter@agcenter.lsu.edu
Tel (225) 578-1634
Fax (225) 578-2257
www.lsuagcenter.com
<http://entomology.lsu.edu/index.htm>

Louisiana State University Agricultural Center
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Flooding damage (Hurricane Gustav) to experimental plots at the Macon Ridge Research Station (photo by Roger Leonard).