FAMU-CAFS

Center for Biological Control Newsletter

Florida A&M University

College of Agriculture and Food Sciences

Tallahassee, FL 32307

2013 Volume 12

Ladybird beetle Predator, *Chilocorus cacti* May Control New Invasive Pest of Florida.

Lambert Kanga, Ph.D.
Professor & Director CBC

Crypticerya genistae (Hemiptera: Margarodidae) also known as soybean scale is an invasive scale insect native to Brazil. The insect was originally described as *Icerya genistae* by Hempel (1912). It has been found in Florida, Barbados, Puerto Rico, Guadeloupe, Dominican Republic and Haiti (Fig. 1). There is a very little information available on this scale insect and its biology. The overall economic significance of this scale insect varied between the different countries infested by the scale. In Florida, *Crypticyera* attackd more than 50 hosts in several plant families (Hodges et al., 2008). The insect pest has been responsible for repeated crop losses in peanut in Barbados and readily attacks plants in the Leguminoseae plant family, including soybeans (Ciomperlik et al. 2010). In Haiti, *Crypticerya genistae* destroyed crops in the northeast of the country (affecting more 10,000 ha). Two natural enemies, the lady bird beetle (*Anovia circumclusa*) and a Phorid fly (*Synegeura cocciphila* Coquillett) have been reported to provide successful control of *C. genistae* (Hodges et al., 2008, Ciomperlik et al. 2010). Preliminary results in our cage studies suggested the ladybeetle predator, *Chilocorus cacti* (Linnaeus) (Coleoptera: Coccinellidae) (Fig. 2) could also be a promising biological control agent for *Crypticerya genistae*.

Fig. 1. *Crypticerya genistae.*
Courtesy of Lyle Buss, U. of Florida: FDACS-DPI

Fig. 2. Adult ladybird beetle, *Chilocorus cacti*

Florida A&M Master's student Saundra Wheeler received a Friends of Southern IPM Graduate Student award on April 8 at the 17th Symposium of the Association of 1890 Research Directors in Jacksonville, FL for her work with small hive beetle control in honey bee colonies.

Dr. Oghenekome Onokpise, Dr. Henry Fadamiro, Saundra Wheeler, Dr. Robert Taylor, Dr. Lambert Kanga

Inside This Issue

Dr. Lambert Kanga
Director/Professor, FAMU-CBC

Dr. Suzie Legaspi
Co-Director, USDA-ARS-CMAVE-CBC

Dr. Robert Taylor, *Dean and Director*
College of Agriculture and Food Sciences

This Newsletter is published by the **Center for Biological Control**. Subscriptions for the newsletter are free, available upon request. Questions, comments or editorial submissions may be submitted to:

Editor: Dr. Raymond L. Hix
Raymond.Hix@FAMU.EDU

Contact Details
FAMU:
Tel. (850) 561-2216
Fax. (850) 412-7263

USDA-ARS:
Tel. (850) 656-9870
Fax. (850) 656-9808

Editorial: Outlook for Optimism with Growth, Challenges and Changes

Dr. Lambert Kanga

The Center for Biological Control (CBC) continues to expand its training, research and outreach activities despite a limited number of core faculty members. The CBC embarks on implementation of its strategic plan with enthusiasm and dedication. As the Center's five year plan draws to an end, it organized a retreat in 2012 to begin planning for the third phase of CBC and to identify research priorities for the next five years. The CBC and its federal agency partners (USDA-ARS and USDA-APHIS) remain committed to the success of its mission.

The major priorities identified for 2013 were (a) the construction of a building to combine the expertise of the Entomology Program, the CBC and partners, (b) the expansion of breadth of research projects and (c) the filling of vacant positions.

The Center has made substantial efforts towards both the construction of the building as well as the filling of vacant positions and the outcome seems promising. However, many of the challenges (resource acquisition and program development) still remain. Appropriate staffing and facilities are critically important for the continued success of the activities of the Center and the national and international recognition of CBC as a Center of Excellence.

The CBC continues to provide successful and novel biologically-based solutions to pest problems for its stakeholders (vegetable producers, cactus industry, honey producers, food industry etc.).

Dr. Jesusa Legaspii

The CBC also emphasizes its support of the academic program as indicates by the record number of new students and high graduation rate. Students in the CBC represent more than 75% of the graduate student population in the College of Agriculture and Food Sciences. In 2013, ten (10) of the twenty one students graduated with a Master of Science degree. Four of the MS graduates have found employment with the State of Florida; the remaining students are enrolled in a doctoral degree program in other institutions. Currently, three Ph.D. students are enrolled in the cooperative program in Entomology between Florida A&M University and the University of Florida.

We thank you for your interest and support and look forward to strengthening our collaborative linkages as we strive to seek solutions to existing and future challenges.

CBC Integrated Management of Thrips in Peanut Crops

Tobacco thrips, *Frankliniella fusca*, and western flower thrips, *F. occidentalis*, are major pests of peanut plants in the southeastern United States. Thrips damage peanut plants primarily by spreading Tomato Spotted Wilt Virus (TSWV), which causes plant stunting and death, and reduces peanut yields. Researchers with USDA-ARS and the Center for Biological Control completed the final year of a three-year peanut field study aimed at integrated management of thrips and TSWV. The study examined the effectiveness of cultural practices like planting date, seeding rate, and resistant peanut varieties, along with reduced risk insecticides, to control thrips and TSWV, resulting in increased peanut yields. Preliminary information from these studies revealed that new peanut varieties, planted early in the season, and sprayed with less harsh, newly developed insecticides can increase peanut yields. Peanut trials were replicated in two locations in south Georgia and one location in north Florida, and carried out with the help of cooperators from the University of Georgia, Tifton and North Florida Research and Education Center, University of Florida, Quincy. The research was funded by Southern Region IPM. [Source K. E. Bowers & S. D. Hight]

USDA-ARS Technician Brandy Lopez (right) monitors the peanut harvest with a field crew from NFREC-UF-IFAS

Research & Outreach News

USDA-ARS-CMAVE/FAMU-CBC Open House

On Aug. 24, 2013, scientists, students and staff at the USDA, ARS, CMAVE satellite laboratory held an open house for the public during the Grape Harvest Festival at the Florida A&M University - Center for Viticulture and Small Fruits Research in Tallahassee, FL. Indoor and outdoor exhibits included pinned insect displays, poster/brochures, live insects and plants, videos, insect traps and collecting equipment, and hands-on demonstrations (ex. insect illustrations, sounds, artwork, balloons, trivia questions). Through trail rides to the ARS field plots and Integrated Pest Management (IPM) plots, visitors were shown the various vegetables, horticultural/ fruit crops and nut trees grown through sustainable management practices such as the use of beneficial insects, trap cropping, insect scouting and cultural practices (in collaboration with FAMU Extension IPM Team). Information was provided on the different research activities on controlling the insect pests such as whiteflies and the cactus moth in vegetable crops and horticultural plants.

FAMU students and Brazilian visitors with Dr. Larry Robinson, Interim FAMU President (3rd from left) [Photo by J. C. Legaspi, USDA-ARS]

What is buzzing!

The New York Times featured and interview with FAMU professor Dr. Lambert Kanga in their Science section originally published on January 29, 2013
A version of this article appeared in print on January 29, 2013, on page D6 of the New York edition with the headline: Pesticide Protection.

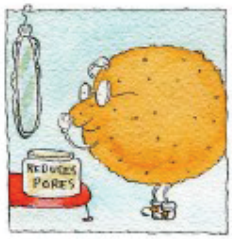
The New York Times

SCIENCE

WORLD U.S. N.Y./REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION ARTS STYLE TRAVEL JOBS REAL ESTATE ENVIRONMENT SPACE & COSMOS

Q & A
Pesticide Protection
By C. CLAIBORNE RAY
Published: January 28, 2013

Q. Are people at risk from pesticide residue on the skin of citrus fruits?



A. Residues from various pesticides may be found on the skin of many fruits, including citrus fruits, but there are official regulatory efforts to keep the levels low in the American market and ways to remove most of the chemicals before the fruit is consumed, said Lambert H. B. Kanga, professor of entomology at Florida A&M University in Tallahassee.

The concentration of residues depends on the class of pesticide and frequency of applications, Dr. Kanga said, and several federal agencies work to protect consumers by setting tolerance limits and regulating use and exposure.

Residues become a concern when repeated exposure to potentially harmful compounds lets them accumulate and gradually increase in concentration to a harmful level, he said, adding that some individuals may be more susceptible than others.

As for removal, the National Pesticide Information Center points out that no washing method is 100 percent effective. Still, Dr. Kanga said, "there are some valuable techniques that provide the best possible outcome when cleaning your fruits and vegetables."

Washing with slightly warm water, 80 to 100 degrees Fahrenheit, is most effective for firm fruits and vegetables, he said.

One way to minimize exposure to chemical residues is to buy certified organically grown crops or to grow your own fruits and vegetables without using chemicals.

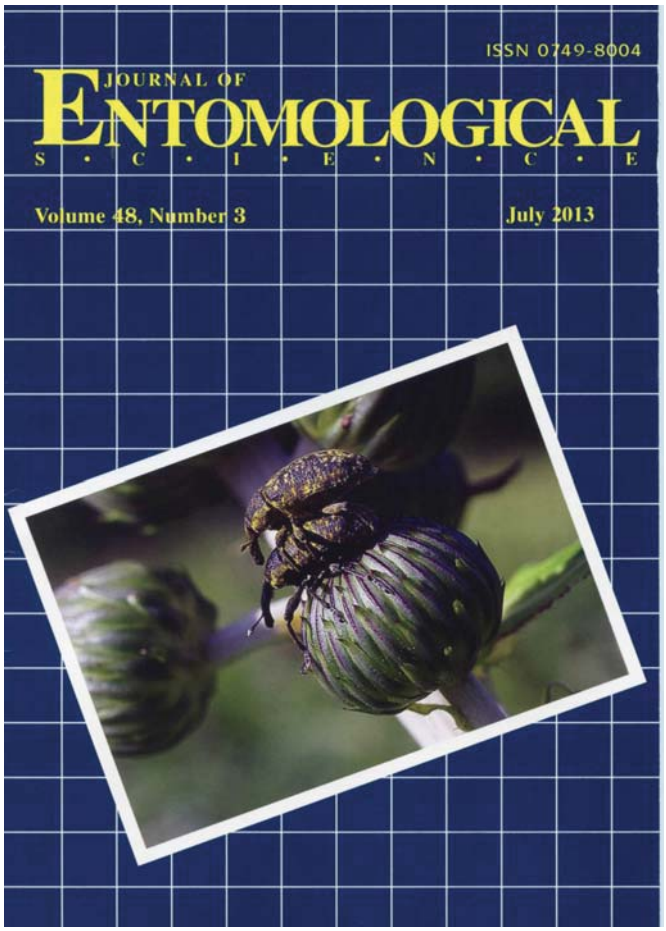
A version of this article appeared in print on January 29, 2013, on page D6 of the New York edition with the headline: Pesticide Protection.

Manipulating Thrips Ecology to Control TSWV in Tomato, Pepper, and Cucumber

Cover crops and companion plants have multiple purposes within an agroecosystem. Some suppress weeds; others attract natural enemies of crop pests or improve soil health. Scientists at the Center for Biological Control received a three-year USDA-SARE grant to develop a system employing all these benefits to suppress Frankliniella occidentalis, western flower thrips, and the plant disease that this insect vectors, Tomato Spotted Wilt Virus (TSWV), in tomatoes, peppers, and cucumbers. Previous research found that not all thrips species vector TSWV. Populations of these non- vector thrips species, which are native to the southeastern US, can build up on flowering vegetation and displace non-native and damaging western flower thrips. The minute pirate bug, *Orius insidiosus*, is an important predator of thrips, especially western flower thrips, and conservation of pollen-rich floral resources is important in attracting and maintaining minute pirate bugs in an agroecosystem. Spanish needle, *Bidens* spp., was planted alongside the planted cash crops to provide pollen to both non-pest thrips and minute pirate bugs. After the cash crops were finished producing, the study plots were planted with sunn hemp, *Crotalaria juncea,* a tropical legume that can smother summer weeds. White lupin, *Lupinus albus,* a cool-weather nitrogen fixing legume, was planted in the fall to increase soil fertility. [Source K. E. Bowers & S. D. Hight]

Journal Cover Photo *Entomological Science*, July 2013 (Vol 48 No 3) Thistle Head Weevils On Thistle

Dr. Raymond Hix



"Push-pull" strategies against vegetable insect pests

Whiteflies and aphids are important insect pests in vegetable crops. To mitigate the use of chemical insecticides, "push-pull "strategies can be used as components of sustainable or cultural pest management. Dr. Jesusa C. Legaspi (USDA-ARS) and collaborators conducted field studies using mustard plants (var. giant red mustard and caliente) as companion crops intercropped at different ratios with the target collard crops. Additionally, laboratory olfactometer tests measured the effects of plant volatiles from giant red mustard as whitefly repellents. We found that the giant red mustard and caliente mustard plants are promising repellents against silverleaf whitefly, thereby comprising a potential "push" component. In another field study, buckwheat was used as an attractive plant for beneficial natural enemies when intercropped with collards. Preliminary analysis combined with a separate study on sweet alyssum intercropped with lettuce revealed the most common predatory hoverflies to be *Eupeodes americanus* and *Allograpta obliqua.* "Push-pull" strategies can be complemented with natural enemy refuges as cultural management techniques in farmscaping towards sustainable management of whiteflies and aphids. [submitted by J. C. Legaspi, USDA-ARS; collaborators: James, Hagler, USDA-ARS, Maricopa, AZ; John Sivinski, USDA-ARS, Gainesville, FL]

Sweet alyssum intercropped with lettuce in demonstration garden. [Photo by J. C. Legaspi, USDA-ARS]

Silverleaf whitefly, *Bemisia argentifolii* adult

Danielle Wolaver, FAMU B. S. student in Entomology

Research & Outreach News

Understanding the Importance of a Non-Native Leaf-Rolling Moth On the Non-Native Chinese Tallow Tree

Chinese tallow tree (Triadica sebifera) is an invasive plant that out-competes native vegetation and is currently on Florida's noxious weed list. In the 1700's, this plant was brought from China to the U.S. as an ornamental and for making soap from its seed oil. The tree has spread throughout the southeastern U.S. and is a problem from South Carolina to Texas. Tallow tree can be controlled by chemical and mechanical means, but this can be costly and only a short-term solution. Few native insects in the U.S. have broadened their host range and attack this plant be controlled by chemical and mechanical means, but this can be costly and only a short-term solution. Few native insects in the U.S. have broadened their host range and attack this plant.

This moth species has numerous generations per year in the U.S. and has become widespread and abundant. Two studies are being conducted by researchers with USDA-ARS and the Center for Biological Control to better understand the importance of this moth on tallow. One study is evaluating the impact this moth causes to small Chinese tallow plants. Half of the plants are sprayed with an insecticide to protect the plants from the moths, and the other half are attacked by the moths. The two groups of plants will be compared as to the numbers of leaf mines and leaf roles they receive, and differences in plant survival and growth measurements. The second study is evaluating the types and abundance of parasitoids attacking the moth larvae throughout the growing season. Since the moth was introduced from China, we want to determine if natural enemies attacking the moth in the U.S. also came from China, or are moving onto this new host from other leaf miners/rollers native to the U.S. These studies will help scientists understand the specific role this insect plays in managing Chinese tallow, and to better understand the general influences that natural enemies have on introduced biological control agents. [Source S. D. Hight & J. L. Mass]

Fig. 1 Photo Caption: ARS Biological Science Technicians John Mass (left) and Kristen Bowers prepare rearing samples of Chinese tallow leaves infested with Caloptilia triadicae larvae to collect potential parasitoids attacking the immature moths.

Fig. 2 Photo Caption: Angela Galette (FAMU Graduate Student and ARS Intern) (left) and John Mass (ARS Biological Science Technician) evaluating Chinese tallow potted plants for damage by the leaf-rolling moth Caloptilia triadicae.

Eric Turner

Eric Turner started an M.S. in entomology in the fall 2013. He has a B.S. in Biology from Fort Valley State University. His major and co-major professors are Dr. Lambert Kanga and Dr. Jesusa Legaspi. His thesis research is on "Analyzing the Functional and Numerical Response of Spined Soldier reared on Kudzu Bug instars."

New International Collaborative Project Initiated on Potential Invasive Weevil Species of the World – Chinese Academy of Sciences, China

The superfamily Curculionoidea of Coleoptera is the largest group of Insecta, with up to 62,000 recorded species. Curculionoidea is also one of the most invasive groups, and includes a large number of well-known pests such as rice water weevil, red palm weevil and cotton boll weevil. Because of the difficulty in identifying Curculionoidea species and the serious damage they inflict on agricultural crops, research specialists of this insect group must work together to solve the global problem of how to identify which weevils are likely to become invasive and then how to prevent their invasion. The project is based on the concept that any pest species in any other country has the potential to be invasive in the local country, and the pests of the local country have the potential to be invasive species in any other countries. This project is funded by the National Science Foundation for five years and Project Director is Dr. Runzhi Zhang. Dr. Haseeb has initiated this project in 2013 and visited Beijing and Jilin Province with Dr. Charles O'Brien to cover fauna of North American weevils. The project will bring together 11 of the most renowned entomologists from 8 countries to carry out research to identify potential invasive weevils of the world. This will be done by providing full protocols for morphological identification of more than 300 important species, building appropriate skills for molecular identification of 50 allied species, producing risk analyses of 100 species, constructing the website "Identification System of Global Potential Invasive Weevils" and publishing an "Illustrated Handbook of Potential Invasive Weevils of the World" are some of the targets of this international collaborative project. Also, faculty and students exchanges will occur for this joint research work. An MOU between Florida A&M University and the Chinese Academy of Sciences is being processed for this collaborative research work on invasive species

Two color forms of *Exophthalmus similis* in Jamaica

Left to Right, Dr. Yussef Omar, Dr. Charles O'Brien and Dr. Muhammad Haseeb in Beijing China

STUDENT NEWS

Kane Barr Completes A B.S. Degree In Entomology

Kane Barr graduated with a B.S. degree in Entomology December 13, 2013. He was hired by ARS-Tallahassee for a term appointment from August 2013 to June 2014 and assisted with research on the Argentine cactus moth, *Cactoblastis cactorum*. Kane successfully competed for an internship from Kansas State University and was in Manhattan, KS during the summer of 2014 working with Dr. C. Michael Smith on a project entitled "The Detection of Tritichome Mosaic Virus in Wheat Breeding Lines". During the internship, Kane gained skills in molecular genetics. After returning from Kansas, Kane moved to Gainesville, FL in August and accepted a job with the UF-IFAS Bee Biology Unit where he coordinates the Operation Pollinator Project spearheaded by Syngenta. The overall goal of the project is to increase the number of pollinating insects on commercial farms by creating specific habitats tailored to local conditions and native pollinators. [Source K. L. Barr & S. D. Hight]

Kane Barr

Student News

Megan Wilkerson Completed An M.S In Entomology

Megan Wilkerson

Megan Wilkerson graduated in August 2013 with an M.S. Degree in entomology. Dr. Raymond Hix was her major adviser, and Dr. Violeta Tsolova and Dr. Oghenekome Onokpise were on her committee. The title of her thesis was "An Evaluation Of Amplified Fragment Length Polymorphism (Aflp) In Characterizing *Aleurodicus rugioperculatus* Martin (Hemiptera: Aleyrodidae) With whitefly species was collected from gumbo limbo trees, in Miami-Dade County,Florida, documenting the first detection of *Aleurodicus rugioperculatus* in the continental US. Apart from *A. rugioperculatus*, Florida's agriculture is vulnerable to two similar whitefly species, *A. dispersus* and *A. dugesii*. Dubbed Rugose Spiraling whitefly, *A. rugioperculatus* has rapidly become a detrimental pest, chiefly problematic for the southernmost counties of Florida, often injurious to gumbo limbo, avocado, coconut and several palm species. The goals of this study were to assess the morphological and population structure of *A. rugioperculatus*. Molecular analysis was achieved through polymorphic fragments generated from amplified fragment length polymorphism (AFLP) markers. AFLP markers allow a rapid assessment of the level of genetic variation that would be difficult to evaluate using a limited number of morphological markers. AFLPs were used to assess the level of genetic variation among *A. rugioperculatus* in 5 different counties in Florida. External morphological examination was accomplished through Scanning Electron Microscope (SEM). Phenotypic characterization revealed a lack of variability both between and among populations. Roughly twenty-six populations of A. rugioperculatus yielded 266 amplified polymorphic bands, which were later analyzed to determine whether prevailing A. rugioperculatus exist as a single, uniform population. This study unveiled several limitations that reduced the quality and capacity of results revealed from the utilization of dominant PCR-based markers. Statistical software evaluated output generated from fragments analyzed by GeneMapper. Genetic analysis revealed similarities between populations from Miami-Dade, Palm Beach, Broward, Collier and Lee counties. Results were consistent with previous reports which indicated that Miami-Dade County was the point of introduction of *A. rugioperculatus*. Megan is working on a Ph.D. in Entomology at The Pennsylvania State Univeristy.

Omotola Dosunmu Completed An M.S. In Entomology

Omotola Dosunmu

Omotoloa Graduated in August 2013 with an M.S. in Entomology. Her major adviser was Dr. Haseeb. Her committee consisted of Dr. Raymond Hix, and Dr. Richard Mankin.

The Title of her thesis was "Early detection of the palmetto weevil, *Rhynchophorus cruentatus* F. ((Coleoptera: Dryopthoridae)." The palmetto weevil, *Rhynchophorus cruentatus* F. is native to Florida and causes economic damage to stressed native palms like *Sabal palmetto* and *Phoenix canariensis*. This study was carried out to determine the feasibility of using acoustic technology to detect and target early instars with the ultimate goal to identify and treat infested trees before extensive damage occurs. Three neonates were put into separate holes drilled in base of uninfested palm frond, there were a total of ten replicates and they were kept under ambient conditions. After 24hours, 2 minute recording of each replicate was made, and this continued at 7 day interval until day 106 after inoculation. Each replicate was recorded five times indoors and outdoors using an AED 2000 insect detector. The recordings were analyzed using the Digitize, Analyze, and View Insect Sounds (DAVIS) software. Results showed that *R. cruentatus* of all instars produced enough audible sounds to be detected both indoors and open environments.

She received her Bachelor's degree in the Department of Plant Science in 2008 at Obafemi Awolowo University, Nigeria. She is currently in the PhD program in entomology at the University of Florida under the supervision of Dr. Oscar Liburd.

Student News

The CAFS Entomology Debate Team Competes During ESA National Meeting Student Debates

The CAFS Entomology Debate Team competed in the Graduate Student Debates at the Entomological Society of America Annual Meeting in Austin, Tx on Nov 12, 2013. They competed against Louisiana State University. The position assigned to the CAFS Debate Team was "Con Team (Florida A&M, faculty advisor - Dr. Raymond Hix), Topic 2: Using Citizen Scientists to Collect Data in Scientific Experiments." The team's paper will be published in a future issue of *The American Entomologist*. In the attached photo from left to right are Julius Eason, Angela Galette, and Courtnee Eddington.

CAFS Team: Julius Eason, Angela Galette, and Courtnee Eddington listen to LSU make theier positional statement.

Angela Hutcherson Completes An M.S. Degree

Angela Hutcherson

Angela (Angi) Hutcherson graduated summer 2013 with a Master's degree in entomology under the direction of Dr. Stephen Hight and Dr. Stuart Reitz. Her graduate committee also included Dr. Raymond Hix and Dr. James Muchovej. Her thesis title was "The Role of Tropical Soda Apple (*Solanum viarum* Dunal) in the Life Cycle of Western Flower Thrips (*Frankliniella occidentalis* Pergande) and the Transmission of Tomato Spotted Wilt Virus in Florida". Because previous reports identified tropical soda apple (TSA) as a reservoir of tomato spotted wilt virus (TSWV), Angi addressed the relationship of western flower thrips (WFT) vectoring TSWV from TSA to crop plants. Angi determined that although TSA pollen increased WFT oviposition compared to tomato and pepper pollen, TSA leaf tissue did not support WFT in the laboratory. Field surveys confirmed that TSA was not used by WFT, although limited numbers of other thrips species were found in field collected flowers. Angi also found that TSWV would not infect TSA, either through insect vectors or mechanical inoculations. Angi's work determined that TSA was not a host plant of WFT or TSWV, eliminating the threat of TSWV transmission to or from crop plants from infected TSA. [Source S. D. Hight]

Grace Mhina Completes An M.S. Degree In Agribusiness

Grace Mhina completed an M.S. in Agribusiness on December 13, 2013. Her major adivser was Dr. Michael Thomas. The title of her thesis is "The cost effectiveness of biological control: the case of invasive mole crickets in Florida commercial pastureland."

Grace Mhina

Netalie Francis

Netalie Francis started an M.S. in Entomology in the fall of 2013. Her major and co-major professors are Dr. Lambert Kanga and Muhammad Haseeb. She is studying the croton scale. She is working with Dr. Cathrine Mannion, University of Florida, Tropical Research and Education Center Homestead, Fl.

Student News

Jordan Williamson Completes An M.S. Degree In Entomology

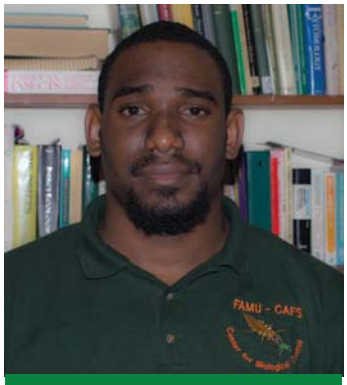
Jordan Williams

Jordan graduated Dec 13, 2013 with an M.S. degree in entomology. Dr. Raymond Hix was her major adviser. Dr. Legaspi and Dr. James Muchovej made up her committee. The objective of her thesis was to determine vegetable host crops serving as favorable reservoirs of parasitoids when attacking leafminers (Agromyzidae: Liriomyza). Brassicaceae, Cucurbitaceae, Fabaceae, Malvaceae, and Solanaceae crop families, in Leon County, North Florida were sampled. One Species of polyphagous leafminers, *Liriomyza trifolii* (Burgess), and nine larvae parasitoids, Braconidae species: *Opius dissitus*, *Opius* sp., *Euopius* sp., Eulophidae species: *Closterocerus* sp., *Chrysocharis* sp., *Diglyphus begini, Diglyphus isaea, Diglyphus intermedius*, and a Ptermalodie species: *Halticoptera* sp. occurred in the Brassicaceae, Cucurbitaceae, Fabaceae, Malvaceae, and Solanaceae crop families. Jordan is currently in the Doctor of Plant Medicine Program at the University of Florida.

Victoria Smith-Thomas Completes M.S. Degree In Agribusiness

Victoria Smith

Victoria Smith graduated with an M.S. in Agribusiness. Her major adviser was Dr. Michael Thomas. Dr. Raymond Hix was on her committee. The title of her thesis was "Calibrating dissimilar payment vehicles in contingent valuation studies: an example of reducing hydrilla in two north Florida spring-fed river systems."



MacArthur Jones

MacArthur Jones is an undergrad majoring in agbuisness. He has worked for Dr. Raymond Hix assisting with field work related to the biological control of hydrilla on the Wacissa River.

Continuing Graduate Students in 2013

Several graduate students continued their work in 2013: Angela Galette (Major Adviser Dr. Stephen Hight) Mr. Gunasegaran Chelliah, Ph.D. Student (Major Adviser Dr. Lambert Kanga), Mr. Eutychus Kariuki, Ph.D. Student (Major Adviser Dr. Raymond Hix), Ms. Latasha Tanner, M.S. student (major adviser Dr. Lambert Kanga), Mr. Julius Eason M.S. Student (Major Adviser Dr. Lambert Kanga).

FAMU student scholarships – awarded by the Reuben Capelouto Foundation – presented at the William L. Peters 37th Annual Field Day and Workshop in Entomology, Nov 2013, Tallahassee, FL.

Tavia Gordon

Tavia Gordon Completed her Bachelor of Technology in Environmental Science degree at the College of Agriculture, Science and Education (CASE) Jamaica in August 2012. Ms. Gordon started her M.S. in Entomology fall 2013 working on "Vegetable Pest Management Using IPM Strategies in North Florida" under the supervision of Dr. Muhammad Haseeb. This research is aimed at developing IPM strategies in vegetable production. The focus of her study is to manage major vegetable insect pests such as the Southern Green Stink bug, *Nezara viridula*; Yellowmargined leaf beetle, *Microtheca ochroloma* and Silverleaf Whitefly, *Bemisia argentifolii* and conservation of natural enemies using plant mediated pest management in an effort to reduce the use of synthetic insecticides by growers. Her expected graduation date is fall 2015.

Carolyn Pompilus

Carolyn Pompilus started an M.S. degree in agribusiness in the fall 2013. She completed a B.S. in Social Science and Foreign Languages (French and Arabic) from Florida A&M University in the spring 2013. Her major advisers are Drs. Mike Thomas and Lambert Kanga. She is working on "Economics Impact of Small Hive Beetles on Honey Bee colonies."

FAMU Linnaean Games Team Competed in Baton Rouge, Louisisana

The FAMU Linnaean Games team competed at the 87th Annual Meeting of the Southeastern Branch-Entomological Society of America meeting in Baton Rouge, La. Eutychus Kariuki, Megan Wilkerson Omotola Donsunmu. FAMU lost a close game in the 2nd round against the University of Arlkansas that went down to the last tossup question 16.

Megan Wilkerson, Omotola Dosunmu, Kane Barr, and Eutychus kariuki Competeing in the SEB-ESA Linnaaen Games during during the 2013 Baton Roughe Meeting.

Peer-reviewed publications:

De Castro, A. A., A. S. Correa, J. C. Legaspi, R. N. C. Guedes, J. E. Serrao and J. C. Zanuncio. 2013. Survival and behavior of the insecticide-exposed predators *Podisus nigrispinus* and *Supputius cincticeps* (Heteroptera: Pentatomidae). Chemosphere. 93: 1043-1050.

Kanga, H. B. L, A.B. Somorin, and K. Aronstein, 2013. Molecular characterization and pathogenicity of fungal isolates for use against the small hive beetle *Aethina tumida* Murray, Subtropical Plant Science 65: 26-35.

Kanga, H. B. L, L. Guito and J. F.Andruz, 2103. Efficacy of new generations of insecticides (multiple site actions) for control of the peanut scale, *Crypticeyra genistae*. Pest Management (In Press)

Kairo, M.T.K., Paraiso, O., Peterkin, D.D., and Gautam, R.D. 2013. *Cryptolaemus montrouzieri* (Mulsant) (Coccinellidae: Scymninae): A Review of Biology, Ecology, and Use in Biological Control with Particular Reference to Host Specificity Issues. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources (in press).

Legaspi, J. C., C. Mannion, D. Amalin and B. C. Legaspi, Jr. 2013. Biology, ecology and control of the ficus whitefly, *Singhiella simplex* (Hemiptera: Aleyrodidae). In Potential Invasive Pests of Agricultural Crops, pp. 363-372, J. Peña, ed. CABI, Oxfordshire, U.K.

Legaspi, J. C., C. Mannion, and D. Amalin. 2012. Preliminary evaluation of *Delphastus catalinae* (Coleoptera: Coccinellidae) as a predator of the ficus whitefly, *Singhiella simplex* (Singh) (Hemiptera: Aleyrodidae). Subtropical Plant Science. 64: 34-36.

Legaspi, J. C., and A.M. Simmons. 2012. Evaluation of selected commercial oils as oviposition deterrents against the silverleaf whitefly, *Bemisia argentifolii* (Hemiptera: Aleyrodiae). Subtropical Plant Science. 64: 49-53.

Miller, N. M., S.Al-Dobai, J. Legaspi and J. Sivinski. 2013. Estimating Attraction of Syrphidae (Diptera) to Flowering Plants with Interception Traps. Biocontrol Science and Technology. 23(9):1040-1052.

Nagoshi, R. N., Paraiso, O., Brambila, J., and Kairo, M.T.K. 2013. Assessing the Usefulness of DNA Barcoding to Identify *Oxycarenus hyalinipennis* in Florida, a Potentially Invasive Pest of Cotton. Florida Entomologist 95: 1174-1181.

Paraiso, O., Kairo, M.T.K., Hight, S., Leppla, N., Cuda, J., Olexa, M., and Owens, M. 2013. Opportunities for Improving Risk Communication during the Permitting Process of Entomophagous Biological Control Agents-Review of Current Systems. BioControl 58: 1-15.

Paraiso, O., Hight, S., Kairo, M.T.K., Bloem, S., Carpenter, J., and Reitz, S. 2012. Laboratory Biological Parameters of *Trichogramma fuentes*i (Hymenoptera: Trichogrammatidae), an Egg Parasitoid of *Cactoblastis cactorum* (Lepidoptera: Pyralidae). Florida Entomologist 95: 1-7.

Tavares, W. De S. J. C. Legaspi, M. T. Tavares, E. Nunez, R. Pinto, and J. C. Zanuncio. 2013. *Brachymeria koehleri* (Hymenoptera: Chalcididae) as a hyperparasitoid of Lespesia melloi (Diptera: Tachinidae) pupae in *Thagona tibialis*(Lepidoptera: Lymantriidae) caterpillars in Brazil. Florida Entomologist, 96(4):1635-1638.

Wyckhuys, K., Lu, Y., Morales, H., Vazquez, L. L., Legaspi, J. C., Eliopoulous, P. A., and Hernandez, L. M. 2013. Current status and potential of conservation biological control for agriculture in the developing world. Biological Control. 65:152-167.

Presentations, Seminars, Extension Activities:

Haseeb, M, O. Dosunmu, and L.H.B. Kanga. 2013. Weevil Pests of Economically Important Crops in the Caribbean Pathways. Talk presented at the 49th Annual Meeting of the Caribbean Food Crops Society held in Port of Spain, Trinidad & Tobago (30 June to 5 July 2013).

Haseeb, M. Offshore Mitigation of Potential Weevil Species. Special talk presented at the Institute of Zoology, Chinese Academy of Sciences, Beijing, China (13 June 2013).

Haseeb, M. Exophthalmus Species Potential Threat to Citrus and Other Economical Crops in Florida. Talk presented at the 87th Annual Meeting of the Southeastern Branch of Entomological Society of America, held in Baton Rouge, Louisiana, LA, The United States (3-5 March 2013

Hix, R.L, E. Kariuki, and J. Cuda. Biological Control of Hydrilla verticillata (L.f.) Royle in the Wacissa Springs Group in the Wacissa River. Southeastern Branch of Entomological Society of America Meeting, Baton Rouge La, March 2013.

Kanga, H. B. L, and C. Carlos, 2013. Monitoring and Mechanisms of Resistance to Miticides in the Ectoparasitic Mite, Varroa destructor Populations in Honey bee, Apis mellifera Colonies. 17th Biennial Research Symposium of the Association of Research Director, Jacksonville, FL. USA

Kanga, L. and J. C. Legaspi. Highlights of research and activities of the Center for Biological Control (CBC). Stakeholder meeting. June 2013, Gainesville, FL.

Miller, N., J. Pinero and J. C. Legaspi. Sustainable practices in vegetable crops: trap cropping and beneficial insect releases. Turkey Hill Farm, Tallahassee, FL, April 2013.

Poster Presentations:

De Castro, A. A., A. S. Correa, J. C. Legaspi, R. N. C. Gueddes, . E. Serrao and J. C. Zanuncio. Sublethal effects of insecticides on the predators, Podisus nigrispinus and Supputius cincticeps: Implications for IPM. SEB-Entomologicl Society of America Annual Meeting. Baton Rouge, LA, March 3-6, 2013.

Donaldson, A. and L. H. B. Kanga, 2013. The Use of Nematophagous Fungi as Biological Control Methods against Parasitic Nematodes. 17th Biennial Research Symposium of the Association of Research Director, Jacksonville, FL. USA

Eason,J. and L. H.B. Kanga, 2013. Monitoring for Susceptibility of the Asian Citrus Psyllid to Insecticides and Potential Microbial Control Agents. Southeastern Branch of ESA annual meeting, Greenville, SC.

Eddington. C. and L. H.B. Kanga, 2013. Insecticide Resistance Management in the Ectoparasitic Mite, Varroa destructor of Honey Bee, Apis mellifera Populations and Susceptibility of this Invasive Alien Pest to Fungal Pathogens. Southeastern Branch of ESA annual meeting, Greenville, SC.

Legaspi, J.C., N. Miller, C. Mannion, and D. Amalin. Ficus whitefly, Singhiella simplex, and its predation by a coccinellid beetle, Delphastus catalinae. Annual Meeting of the Entomological Society of America, Austin, TX, Nov. 10-13, 2013.

Siebert, S. and L. H. B. Kanga, 2013. Assessing Honey Bee (Apis mellifera L.) Health in Conventional and Organically-Kept Apiaries for the Development of Sustainable Beekeeping Practices. 17th Biennial Research Symposium of the Association of Research Director, Jacksonville, FL. USA

Tanner, L. and L. H.B. Kanga, 2013. Evaluation of monitoring methods for the redbay ambrosia beetle (Xyleborus glabratus), a new invasive species from southeast Asia. Southeastern Branch of ESA annual meeting, Greenville, SC.

Participation (University and Public Service / Outreach Activities / Workshops):

Monarch Butterfly Festival, Entomology Club, St. Marks National Wildlife Refuge, St. Marks, FL. October 27, 2013
FAMU Grape Harvest Festival, Tallahassee, FL, August 24, 2013
W. L. Peters 36th Annual Field Day and Workshop in Entomology - FAMU, Tallahassee, FL, November 6-8, 2013
Vegetable and Small Farm Fruit IPM workshop, Center for Viticulture, FAMU, spring 2013

USDA - ARS – CMAVE / CBC-FAMU Contact information

USDA-ARS-CMAVE 6383 Mahan Dr. Tallahassee, FL 32311
Center for Biological Control, Perry-Paige Building South Room 308, Tallahassee, 32307

Dr. Jesusa (Susie) Legaspi
Research Entomologist & CBC Co-Director
850-656-9870 ext. 10
Jesusa.Legaspi@ars.usda.gov

Dr. Stephen Hight
Research Entomologist
850-656-9870 ext. 18
Stephen.Hight@ars.usda.gov

Mr. Neil Miller
Biological Science Tech
850-656-9870 ext. 28
Neil.Miller@ars.usda.gov

Mr. John Mass
Biological Science Tech
850-656-9870 ext. 27
John.Mass@ars.usda.gov

Ms. Kristen Bowers
Biological Science Tech
850-656-9870 ext. 22
Kristen.Bowers@ars.usda.gov

Mr. Marcus Edwards
Farm Manager
850-510-0385
Marcus.Edwards@ars.usda.gov

Dr. Lambert Kanga
Professor and Center Director
850-599-8725
Lambert.Kanga@famu.edu

Dr. Raymond Hix
Associate Professor
850-561-2216
Raymond.Hix@famu.edu

Dr. Muhammad Haseeb
Research Associate
850-412-7060
Muhammad.Haseeb@famu.edu

Ms. Rashunda Keenon
Administrative Assistant & Office Manager
850-599-4929
Rashunda.Keenon@famu.edu

Dr. Robert Taylor
Dean, CAFS
850-561-2644
Robert.Taylor@famu.edu

Advisory Council Members

Dr. Norman Leppla, UF, IFAS, Gainesville, FL (Chair)
Mr. Joshua Craft, Florida Farm Bureau, Gainesville, FL
Ms. Abbie Fox, DPI, FDACS, Gainesville, FL
Mr. Paul Hornby, USDA, APHIS, PPQ, Gainesville, FL
Dr. Charlie Mellinger, Glades Crop Care, Inc. Jupiter, FL
Dr. Amy Roda, USDA, APHIS, PPQ, CPHST, Miami, FL
Dr. Don Schmitz, Invasive Plant Management Section, FFWCC, Tallahassee, FL
Dr. John Sivinski, USDA, ARS, CMAVE, Gainesville, FL
Dr. Trevor Smith, DPI, FDACS, Gainesville, FL
Dr. Jennifer Taylor, CAFS, FAMU, Tallahassee, FL
Dr. Verian Thomas, Graduate Studies and Research, FAMU, Tallahassee, FL

Ex-Officio Members

Dr. Robert Taylor, CAFS, FAMU, Tallahassee, FL
Dr. Ken Redda, Division of Research, FAMU, Tallahassee, FL
Dr. Lambet Kanga, CBC, CAFS, FAMU, Tallahassee, FL
Dr. Oghehenkome Onokpise, CAFS, FAMU, Tallahassee, FL
Dr. Susie Legaspi, USDA, ARS, Tallahassee, FL

Recognition for Dr. John Sivinski's service to FAMU-CBC as Research Leader. (4th from the left, back row)

M.S. Student (Megan Wilkerson) making presentation at Southeastern Branch of the Entomological Society of America

Graduate Assistantships Available

Interested in joining our M.S. Entomology Program or the cooperative Ph.D. Program? Please write to Dr. Lambert Kanga (Lambert.Kanga@FAMU.EDU).

Website Links:

FAMU: http://www.famu.edu/index.cfm?a=cesta&p=CenterforBiologicalControl

USDA-ARS: www.ars.usda.gov/saa/cmave/ibbru

Protecting the Nation's Food Supply, Natural Resources and Human Health

Center for Biological Control
Florida A&M University
310 Perry-Paige Building
Tallahassee, FL 32307-4100