



Center for Biological Control Celebrates 10 Year Anniversary

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The 10-Year Anniversary Symposium included poster presentations in the School of Architecture Building Atrium

The Center for Biological Control (CBC) was formally established in 1998 within the College of Engineering Sciences, Technology and Agriculture at Florida Agricultural and Mechanical University (FAMU). Leaders from the United States Department of Agriculture (USDA) Animal Plant Health Inspection Service (APHIS) and Agricultural Research Services (ARS) chose FAMU as the site to establish a Center for Excellence that would implement a biological approach to pest management. The CBC team member Kenneth Bloem was the first APHIS researcher to join the CBC in 1998. In 1999, USDA-ARS agreed to support the CBC as well with funding and personnel. During its ten years of service, the CBC has developed and implemented ecologically-sound pest management solutions for several invasive insects and weeds, including cactus moth, varroa mite, tropical soda apple, hydrilla, and cogongrass. CBC researchers not only investigate invasive pests in the US, but they also are studying pests in the Caribbean and South America that are considered high risk for entry into the US.

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Dr. Moses T.K. Kairo
Professor/Director, FAMU CESTA-CBC

Dr. Stuart R. Reitz
Co-Director, USDA-ARS-CMAVE-CBC

Dr. Makola M. Abdullah
Professor and Dean
College of Engineering Sciences,
Technology and Agriculture

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:

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Team from the CBC Receives Friends of IPM "Pulling Together" Award

Dr. Steve Toth, Associate Director of the Southern Region IPM Center (SRIPMC) attended the 10 Year Anniversary Symposium on April 9th, 2010 to present the Friends of IPM "Pulling Together Award" to the CBC team comprised of experts from FAMU-CESTA, USDA-ARS and USDA-APHIS. The CBC won the award for outstanding integrated pest management research, education and outreach.

The Friends of IPM Award recognizes individuals and groups who have demonstrated outstanding service in IPM. The Pulling Together award is one of six categories of awards in the program. "Based on the nomination, *continued on page 2*



Dr. Steve Toth (Associate Director of the Southern Region IPM Center) presents the plaque for the Friends of IPM "Pulling Together" Award to Dr. Moses Kairo (Director of CBC) and Dr. Makola Abdullah (Dean, College of Engineering Sciences, Technology and Agriculture).

Editorial: A Decade of Action, Growth and Delivery



Dr. Moses T.K. Kairo,
Center Director

The Center marked ten years of existence by holding a symposium and open house on April 9, 2010. We were honored to have many of our stakeholders, partners, collaborators and friends attend this event. A special 10th anniversary brochure outlining some of the key milestones and outcomes was produced



and this is available on request. Additionally, some of the pages of this newsletter provide a snap shot of the event.

Whereas as Directors, we would naturally be expected to say nice things about the Center, I believe it is fair to say that over the last decade, the Center has grown tremendously both in terms of numbers of faculty and students, but more critically in the portfolio and breadth of projects and issues addressed. Clearly, the commitment of the three partners (USDA-APHIS, USDA-ARS and FAMU) has been critical in ensuring this growth, as well as the support from other agencies especially USDA-NIFA and the State of Florida.

We believe that this commitment and support have been rewarded in the impact the Center has had, as shown by the following highlights:

- The Center has been actively investigating effective, sustainable management tactics for the Varroa mite, a key pest of honeybees. This research is helping to reverse the decline of honeybee populations throughout the US.
- CBC research findings have been incorporated into the IPM Florida guidelines for vegetable production, thus directly benefitting farmers.
- The Center is a key player in offshore efforts in the Caribbean Basin, to mitigate the threat of invasive species.
- The Center is involved in natural resource management as well as agricultural pest management research, as exemplified by it's lead role in limiting the range expansion of the invasive Cactus moth and efforts to eradicate the moth from Mexico.
- The Center has capitalized on FAMU's historic strength in taxonomy by developing LUCID diagnostic keys for important groups of pest and beneficial insects.
- The Center has mentored at least 10 M.S. and many B.S. students. Currently there are 10 graduate students including three Ph.D. students in the cooperative program.



Dr. Stuart R. Reitz, Co-director

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10-Year Anniversary continued from page 1

In addition to publishing their research in journal articles and presentations, they also share their knowledge with students. The CBC is at the core of the cooperative Ph.D. program in entomology which is managed jointly by Florida A&M University and the University of Florida.

The CBC is now a recognized Research Center within the Florida State University System. Dr. Charlie O'Brien served as the CBC's first Director with Dr. Ken Bloem (USDA-APHIS), and Dr. Stuart Reitz (USDA-ARS) serving as Co-Directors. Dr. O'Brien retired in 2004. Although he now resides in Arizona, he still collaborates on projects with the CBC. In 2005, Dr. Moses Kairo was hired as the new Director and Dr. Reitz as Co-Director. Dr. Bloem relocated to Raleigh in 2006 but the strong linkages between USDA-APHIS and the Center are maintained through collaborative work.

Awards were presented by Drs. Abdullah (Dean, CESTA) and Kairo to members of the CBC Advisory Council for appreciation of their service in providing oversight which is instrumental in the CBC's success.



Discussions occurred in front of the posters during the afternoon. Drs. Stephen Hight (CBC) and Ed Knipling (Administrator, USDA-ARS) (right) conversing to the right and Dr. John Capinera (Chair UF, Entomology and Nematology Dept.) and Abbie Fox (Assistant Bureau Chief, BMDBC-DPI, Florida Dept. of Agriculture and Consumer Services) (left).

IPM Award continued from page 1

the CBC is clearly deserving of the Friends of IPM Award," said Steve Toth, associate director of the Southern Region IPM Center who presented the award. Recipients were Drs. Moses Kairo (Director), Stuart Reitz (Co-Director), Jesusa Legaspi, Lambert Kanga, Stephen Hight, Ken Bloem, Muhammad Haseeb, Wills Flowers and Raymond Hix.

Supporters of the CBC from universities, USDA, private consulting companies and the state legislature were gathered at a Symposium celebrating the 10th Anniversary of the CBC. Staff from the offices of Congressman Allen Boyd and Senator Bill Nelson were among those who witnessed the award presentation. The CBC Advisory Council was also present. "We really appreciate the recognition, especially during these tough times," said Dr. Makola Abdullah, Dean of CESTA.

Center for Biological Control Celebrates 10 Year Anniversary



Participants viewed posters during the 10 Year Anniversary Symposium



Some of the many conversations during the poster presentation portion of the CBC 10 Year Anniversary celebration.



People gathered and talked during the poster presentations in the Atrium of the Architecture Building most of the afternoon as part of the CBC 10 Year Anniversary Symposium.



Students gathered in the Atrium to make poster presentations.



Students gather near a poster during the CBC 10 Year Anniversary Symposium

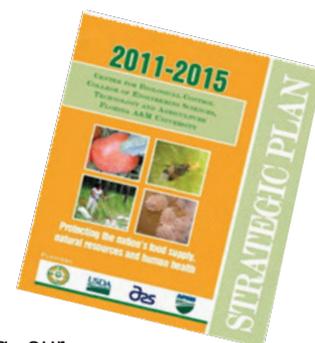
Editorial (continued from page 2)

This year was also significant because following endorsement by the Advisory Council, the Center launched its new strategic plan for 2011-2015. While reaffirming the Center's vision - to protect the Nation's food supply, natural resources, and human health, the new plan emphasizes four interlinked objectives:

1. *To generate and apply knowledge in the development of ecologically-based management of pests in agroecosystems, with a particular focus on invasive alien species.*
2. *To develop human capacity for continued future innovation, through undergraduate, graduate and specialist training.*
3. *To implement innovative knowledge transfer and public outreach efforts, ensuring that solutions generated by the Center benefit the targeted end users.*

4. *To ensure operational effectiveness and growth of the center.*

We believe that by focusing our efforts on these objectives, the Center will be able to effectively deliver on its mission: *To generate, apply and transfer innovative, ecologically based solutions to pest problems affecting agriculture, natural resources, and human health while developing the human capacity for continued future innovation.* This ensures that the Center will continue to focus on fulfilling the land grant mission by addressing issues of state, national and global significance. The strategic plan and 10th anniversary brochure are available on request by emailing (Moses.Kairo@famuedu.edu).



Student News & Research

Three Students Completed their M.S. Degrees



Keith Marshall (2nd R) and his committee from right, Drs. Jesusa Legaspi, Lambert Kanga and Manuel Pescador

Keith Marshall had a successful thesis defense for a Master of Science degree in Entomology in the Fall semester of 2010. Under the guidance of Dr. Lambert Kanga, He developed a user friendly technique for use in monitoring for insecticide resistance in the *Varroa* mite populations. He also determined the genetic and physiological mechanisms of resistance to these insecticides and designed a resistance management strategy for *Varroa* mite in honey production. He will be joining the United States Army as medical entomologist with the rank of First Lieutenant and will be stationed in Fort Benning, GA.

Eutyachus Kariuki graduated this fall with a Master's degree in entomology under the direction of Dr. Raymond Hix. His thesis title was "tropical soda apple *Solanum viarum* - mediated competition via induced resistance: interaction between *Gratiana boliviana*, *Frankliniella occidentalis* and *Spodoptera exigua*".



Eutyachus Kariuki (right) receives his Master's degree from President James H. Ammons

Some of the findings in his study include: 1) feeding action of *Gratiana boliviana* 3rd instars on TSA had a substantial effect on the survival of beet armyworm larvae; 2) The results further showed that feeding action of *G. boliviana* on TSA had no significant influence on WFT host choice; and 3) results suggested that the biological control agent, *G. boliviana*, provides better control of plants growing in shade than plants growing in full sun, and it is more likely to have a greater impact in terms of defoliation.

Eutyachus will be starting a Ph.D. working hydrilla biological control on the Wacissa River. His co-major advisors will be Drs. Raymond Hix (FAMU) and Jim Cuda (University of Florida). He will be participating in the FAMU-UF Co-operative Ph.D. program.



Dr. Mike Thomas and Nandkumar Divate

Nandkumar Divate graduated this summer with a Master's degree in Agribusiness under the direction of Dr. Mike Thomas. His thesis title was "Economic Impact of Cogongrass on Private Non-Industrial Forest Owners in Florida".

Some of the findings in his study: 1) Cogongrass was ranked by Private Non-industrial Forest Owners as the most common forest weed across the state of Florida; 2) With Cogongrass's continued spread, it will likely generate more economic losses to the woodland industry; and 3) With impacts ranging from \$18.5 to \$43.9

million on NIPF owners cogongrass is major concern for Florida and other southeastern states.

Nandkumar is currently working with Dr. Kairo on a project to review the economic impact of Tropical Soda Apple (TSA) on Ranchers in Florida. The project will help to document the effect of green tortoise beetle (*Gratiana boliviana*) which was introduced over the past several years to help control TSA in Florida.

Nandkumar recently got a job with The International Agriculture Program in CESTA FAMU. He will be working as an Agricultural Development Specialist in the Farmer to Farmer program. [Funding: USDA-APHIS]

Three New Graduate Students Join the Center



Saundra Wheeler is a third semester graduate student majoring in Entomology and Agricultural Biosecurity. Ms. Wheeler received her BS degree from Fort Valley State University in Agricultural Science with a concentration in Plant Science and Biotechnology. Her major professor is Dr. L. B. Kanga. The focus of her research is the Small Hive beetle and the development of its control. She is member of several organizations such as Ecological Society of America, FAMU Entomology Club, Alpha Kappa Mu National Honor Society, Beta Kappa Chi Honor Society, Sigma Gamma Rho Sorority, Inc., MANNRS, and NAACP.

Shalom Siebert Benton received her undergraduate degree in Entomology and Structural Pest Control from Florida A&M University (FAMU) with a minor in Spanish. As an undergraduate, Siebert participated in an internship in Ecuador with Dr. Wills Flowers where she assisted him on two CRSP (USAID) projects:



one on aquatic biomonitoring and the other on integrated pest management in cacao. Later she was employed as a research assistant with USDA and FAMU on a project to evaluate potential biological control agents of the invasive pest *Cactoblastis cactorum* with Dr. Stephen Hight and Oulimathe Paraiso. Siebert has also worked with Dr. Moses Kairo on an international project to update the BIOCAT database. Currently Siebert is a graduate student under Dr. Lambert Kanga. She is working towards a Master of Science degree in Entomology and Biosecurity. The title of her research project is "A Comparative Study on Bee Health in Organic and Conventional Beekeeping." During her leisure time she practices ballet and enjoys spending time with her family and three dogs.



Geldar Matungwa is pursuing her master's degree in Agricultural Sciences with a concentration in Agribusiness. She attained her bachelor's degree in Environmental Sciences and she hopes to be an environmental economist in the future. She is currently working on assessing the economic the threats of the Red Palm Weevil to the palm industry in the United States under the guidance of and Drs. Michael Thomas and Moses T. Kairo.

Florida A&M University Linnaean Team Competes at the ESA-SEB 4th Straight Year

The Florida A & M University Linnaean Team took on the University of Florida and University of Georgia teams at the meeting of the Southeastern Branch (SEB) of the Entomological Society of America (ESA) in March 2010 held in Atlanta, Ga. The Rattlers were competitive in the game that ultimately went down to the final question, but the Rattlers came up short in the semi-finals against Georgia. The 2010 team was comprised of **Oulimathe Paraiso**, **Antonio Francis**, (Ph.D. students), and **Eutyachus Kariuki** (M.S. student) and **Kaneisha Barr** (Undergraduate). Alternates on the FAMU team were **Jordan Williamson** and **Chris Linton**. This was the fourth year in a row that Florida A&M University has sent a team to the ESA-SEB meeting under the guidance of Dr. Raymond Hix. The Games were won by Georgia with Florida the runner-up. Georgia and Florida will be representing the SEB at the National completion at the ESA National Meeting in December at San Diego. The FAMU team is beginning preparations to compete at the SEB branch meeting in Puerto Rico in March 2011.



The FAMU Linnaean Team from left to right: Antonio Francis, Kaneisha Barr, Oulimathe Paraiso, Eutyachus Kariuki



Some of the FAMU Linnaean Team and the Games Master Dr. Norm Leppla visit during the SEB mixer after the Linnaean Games. From left to right: Eutyachus Kariuki, Raymond Hix (coach), Kaneisha Barr, Norm Leppla (Games Master), Oulimathe Paraiso, and Jordan Williamson (alternate).

Students Receive Scholarships from the Reuben Capelouto Foundation

Once again the Reuben Capelouto Foundation generously awarded scholarships to ten entomology students based at the Center. The awards were presented during the Annual Field Day & Workshop on Nov. 4, 2010. The Center continues to be very appreciative of this support from the Foundation.



Back row: from right to left: Mr. Grant Capelouto representing the Foundation, Mr. John Dukes III (chair of the Advisory Council), and student recipients, Eutyachus Kariuki (M.S.), Keith Marshall (M.S.), Antonio Francis (Ph.D.), Enger German-Ramirez (M.S) and Drs. Lambert Kanga (Graduate Coordinator) and Oghenekome Onokpise (Associate Dean). Seated from right to left B.S students: Jordan Williamson, Kaneisha Barr and Courtney Eddington; Shalom Siebert-Benton (M.S.) and Oulimathe Paraiso (Ph.D.) Chris Linton also received a scholarship but missed the photo.

Faunistic Survey of Mealybugs in the Dominican Republic



Enger German Ramirez, M.S. student working under Dr. Kairo spent the summer in the field in the Dominican Republic collecting data for his thesis research, "A faunistic survey of mealybugs and their natural enemies in cocoa and coffee agro-ecosystems".

Graduate and Undergraduate Students Intern with USDA APHIS in Raleigh, NC

FAMU interns from the Center participated in risk analysis projects with USDA-APHIS in Raleigh, North Carolina this past summer. **Saundra Wheeler** (M.S. Student) participated in the *Phytophthora ramorum* project. she conducted a literature review on *P. ramorum* and prepared an annotated bibliography that was



Interns Saundra Wheeler (left) and Kaneisha Barr (right) with former FAMU student Ignacio Baez (now a CPHST employee) (center)

used to develop a detection protocol. Her mentor was Dr. Betsy Randall-Schadel. They also teamed up with members of the Pest Epidemiology and Risk Analysis Laboratory (PERAL) lab and volunteered at the Ag-Discovery camp for high school students. **Kaneisha Barr's** mentor was Dr. Esther Spaltenstein. Kaneisha (undergraduate student) worked with The New Pest Advisory Group (NPAG), helping them archive internal NPAG reports for an audit scheduled this past August. Kaneisha also completed a few literature reviews with Saundra and Dr. Randall-Schadel, and assisted Dr. Karl Suiter in entering data for the Medhost Plant Species List. **Jordan Williamson's** mentor was Dr. Stephanie Bloem. [Funding: USDA-NIFA; Contact: Moses Kairo]



Bukhari Baaset and Jordan Williamson

Staff News and Research

Dr. Fiaboe Joins CBC as Postdoc Research Associate

Dr. Komi K. M. Fiaboe joined the Center for Biological Control on October 22nd 2010 as Research Associate (Postdoc) in the "Strategic research on pest threats in the Caribbean Pathway" project led by Dr. Moses Kairo and Dr. Amy Roda (USDA-APHIS). The project aims at supporting efforts to better prepare USA and countries in the Greater Caribbean Region to effectively deal with existing and/or imminent invasive alien pest threats by generating the necessary knowledge which will facilitate preemptive action or rapid response should pest threats become established.



Dr. Komi K. M. Fiaboe

Dr. Fiaboe, a Togolese citizen, obtained his PhD in Entomology from Kenyatta University (KU-Kenya), through a collaborative program between the International Center for Insect Physiology and Ecology (ICIPE-Kenya), Escola Superior de Agricultura Luis de Queiroz (ESALQ-Brazil), Universidade Federal Rural do Pernambuco (UFRPE-Brazil) and KU from 2002 to 2007.

His MSc research was carried out at the International Institute of Tropical Agriculture (IITA) in Benin. Prior to joining FAMU, he served from 2006 to 2009 as Banana Entomologist at IITA in Uganda.

CBC Associate Travels to Port of Spain to Conduct Economics Workshop

Within the CBC, considerable effort is spent on establishing bio-control measures for invasive alien species (IAS). The methods of these invasions are often linked to human activities such as global trade and tourism. While CBC entomologists focus considerable attention to searching for biological agents to help control IAS spread, there is also growing interest in documenting the economic importance of these invasions. **Dr. Michael Thomas**, a Professor of Agribusiness and CBC associate, recently travelled to Port of Spain, Trinidad-Tobago to help conduct a three day workshop on the economics of invasive pests. During the meetings, Dr. Thomas worked with staff from the CABI Caribbean and Latin American Regional Center and faculty from the University of the West Indies to teach the basics of environmental economics to over 50 professionals from over a dozen island nations. This effort is part of a larger CBC goal of working with Caribbean nations to identify and stop potential pests before they enter our country and to increase the public's awareness of the IAS problem. [Funding: USDA-NIFA & USDA-APHIS; Contact: Michael Thomas]



Dr. Michael Thomas making a presentation at the CABI led invasive species workshop in Port of Spain.

Whiteflies and Cole Crops

Whiteflies, such as *Bemisia tabaci*, are major insect pests of important vegetable and horticultural crops. One method to control this pest is the use of companion plants that repel the insects. Dr. Jesusa C. Legaspi and cooperators conducted research on the effect of giant red mustard (*Brassica juncea*) plants in reducing whitefly populations in vegetables. In greenhouse studies, potted giant red mustard plants were planted next to collards. After a certain period, whiteflies were released near the potted plants. Collards planted next to the giant red mustard plants had significantly lower numbers of whiteflies compared to collards alone. It is possible that whiteflies were repelled by plant volatiles from the giant red mustard plants. In field experiments, larvae and adult whiteflies were highest on squash and cantaloupe, intermediate on broccoli, collards and cabbage, and lowest on mustard. In collaboration with a chemist, Dr. Agnes Rimando, (USDA, ARS, University, MS), further studies will involve determination of potential compounds in these plant volatiles for possible use as insect control agents. [Funding: USDA-ARS; Contact Jesusa Legaspi]

A Fast and User-friendly Technique to Monitor for Resistance in the Vampire Varroa Mite is now Available.

The occurrence of pesticide resistance in the Varroa mite is a serious threat to the beekeeping industry and crops that rely on the honey bee for pollination. **Dr. Lambert Kanga** and his research team have developed a simple, fast and user-friendly technique using glass vial tests to monitor for resistance in Varroa mite populations. Stakeholders could easily collect data needed to make informed decisions on an overall integrated pest management strategy.



Monitoring honey bee colonies at FAMU's Quincy Farm

A Dreaded Pest is Reported in the US

As part of its offshore work program, the CBC has been working on several dangerous pests which are a threat to the United States. One such pest is the red palm weevil, *Rhyncophorus ferrugineus* which appeared in the Curacao and Aruba about two years ago. CBC (Drs. Fiaboe and Kairo) has been collaborating with USDA-APHIS-CPHST (Dr. Amy Roda) and USDA-ARS (Dr. Richard Mankin) to generate critical information on the pest. Unfortunately in September,

2010 this dangerous pest was reported in Southern California. In view of the dangerous nature of the pest, CBC is continuing to work in Curacao and Aruba to mitigate spread of the pest in the Caribbean which would increase the risk of spread to Florida. [Funding: USDA-APHIS and USDA NIFA; Contacts: Komi Fiaboe]



A handful of red palm weevil grubs and pupae in Curacao.

Development of Enhanced Lure for the Invasive Argentine Cactus Moth

An insect trap baited with a synthetic female sex pheromone is being used in Mexico and the U.S. to monitor the presence of the Argentine cactus moth, *Cactoblastis cactorum*. While the current synthetic pheromone works, it catches many non-target moths. Scientists with the CBC are conducting collaborative research with a Mexican pheromone chemist to identify a better trap for this invasive pest insect. New female sex pheromone components that were identified in laboratory studies are being evaluated in field trapping studies. An improved pheromone will be one that attracts and captures more cactus moths while capturing fewer non-target moths. [Funding: USDA-ARS, USDA-APHIS, and Mexican Government; Contact Stephen Hight]



CBC scientists Chris Albanese (left) and Stephen Hight (right) check cactus moth traps baited with different experimental female sex pheromone blends. (Photo by Mayon Hight)

Enlisting the Fungi *Beauveria* #5658 and *Metarhizium* #5957 to Protect the Honey Bee from the Invasive Small Hive Beetle.



Dr. Lambert Kanga

Agriculture increasingly depends on managed honey bees for crop pollination, but the numbers of managed hives have been drastically declining over the past few years due to honey bee pest species such as the small hive beetle. This invasive and destructive pest has spread into more than 30 states since its recent introduction and caused substantial damage to honey bee colonies. Dr. Lambert Kanga and his research team have identified two fungal pathogens that are highly pathogenic to the small hive beetle, especially in soil applications.



Metarhizium #5957 sporulating on small hive beetle

The Economic Benefits of TSA Biological Control

Tropical Soda Apple (TSA) is an invasive exotic plant from South America that has become a weedy pest choking pastures and afflicting Florida's beef producers. In 2007, CBC associate Dr. Michael Thomas and MS student Tajudeen Salaudeen undertook a survey of Florida's cattle owners and documented a significant economic loss due to TSA. The economic impact at the state level ranged from approximately \$6.5 million to \$16 million annually.

Additionally, the CBC and entomologists with the University of Florida have worked together the past several years designing a biological control program to reduce the presence of TSA. After careful evaluation, the green tortoise beetle (GTB) has been released at several sites across Florida. Also a native of South America, the GTB is particularly fond of TSA foliage with no alternative native hosts. Initial results indicate the beetle is rapidly spreading and significantly reducing TSA stands in many areas of the state. To document the economic impact of this biological control effort, the CBC is presently implementing a follow up survey of Florida's cattle owners. Initial returns suggest that average TSA control costs are lower with biological control and cattle owners have noticed a significant reduction in TSA infestations. [Funding: USDA-APHIS, Contact Michael Thomas]



CBC scientists John Mass (right) and Chris Albanese (left) evaluate damage to Tropical Soda Apple plants caused by an introduced leaf-feeding beetle from Argentina. (Photo by Stephen Hight)

Management of Tropical Soda Apple

A leaf-feeding beetle from Argentina has been used in south and central Florida to successfully control the noxious weed tropical soda apple. Beetle density and spread are increasing at south Florida release sites, however, beetle releases in north Florida have been disappointing – beetles do not become established for more than one year. The beetles are originally from warmer regions in South America and they may not be able to persist in the cooler winter temperatures of north Florida. Scientists with the Center for Biological Control are collaborating in identical studies conducted in north and south Florida to compare the beetles' survival over the winter, adult longevity, reproductive output, and attack from predators and parasitoids. This information has implications for management tactics of tropical soda apple, selection of control agents, and release strategies of biological control agents. [Funding: USDA-ARS, Contact Stephen Hight]

IPM-Ramp Project Funded to Battle Hydrilla

Dr. Raymond Hix (Associate Professor in CBC) is part of an interdisciplinary team funded for a new project designed to tackle one of the U.S.'s most troublesome invasive plants: The Hydrilla Integrated Pest Management Risk Avoidance and Mitigation Project (Hydrilla IPM RAMP).

Hydrilla verticillata (a.k.a. hydrilla) is an invasive freshwater weed common in Florida. It was probably brought to the Tampa and Miami areas as an aquarium plant in the late 1950s. By the 1970s, it was established throughout Florida. If left unmanaged, hydrilla is capable of creating damaging infestations which can choke out native plants, clog flood control structures (which can lead to flooding), and impede waterway navigation and recreational usage. In addition, hydrilla is showing resistance to fluridone, a systemic herbicide used to manage it for the past 20 years. According to the University of Florida (UF)/IFAS Center for Aquatic and Invasive Plants, millions of dollars are spent each year on herbicides and mechanical harvesters in Florida in an effort to place hydrilla under "maintenance control."

There is a need for experts to design and transfer new, innovative methods of managing hydrilla.

Thanks to a new 4-year, \$500,000 grant from the USDA National Institute of Food and Agriculture, UF/IFAS research and extension faculty, FAMU Faculty and an ARMY Corps Engineer are tackling the hydrilla problem head-on. This funding will enable the team to study new chemical and biological control methods as part of an overall hydrilla integrated pest management (IPM) plan.

As part of this project, the partnership of researchers will be studying the impacts of the integrated use of a new herbicide, a naturalized hydrilla mining midge and a native fungal pathogen. Co-PI's on the grant are: James P. Cuda (Lead PI) and Jennifer L. Gillett-Kaufman, UF/IFAS Entomology & Nematology Department; • Raymond L Hix, FAMU; Joan P. Bradshaw, UF/IFAS Extension: Citrus County; Ken Gioeli, UF/IFAS Saint Lucie County Cooperative Extension; Stacia Hetrick, UF/IFAS Osceola County Extension; William A. Overholt, UF/IFAS, Indian River Research and Education Center and Judy F. Shearer, U.S. Army Corps of Engineers, Research and Development Center [Funding: USDA-NIFA; Contact Raymond Hix]

Dr. Ralph Wills Flowers Retires After 34 Years

In December 2010, **Dr. Ralph Wills Flowers** retired from FAMU after 34 years of service. For the past 10 years, he was assigned to the Center for Biological Sciences in the College of Engineering Sciences, Technology and Agriculture. Dr. Flowers has been the recipient of two Fullbright Scholarships. He has been very active in international research while at FAMU, including projects in Ecuador, Costa Rica, Panama and Peru. He has published over 100 peer reviewed scientific journal articles and book chapters as well as numerous reviews. His areas of interest and expertise include leaf beetle taxonomy, aquatic insect ecology and vegetable pest management. Wills will be greatly missed, but as Emeritus Professor, we hope to continue seeing him!



of *Neochaetina bruchi* (identification confirmed by Dr. O'Brien) on many plants which appeared to be thriving in the presence of their alleged biocontrol agent. Neither the feeding preferences of the weevils nor the genetics of the water hyacinths are known from this part of Ecuador, so some interesting research waits to be done here.



Pushing through a mass of water hyacinth in the Esperanza Reservoir.

The Microhymenoptera Workshop: Taxonomy may be an unpopular dying branch of science in the United States, but nobody in Ecuador seems to have got that memo. When I gave an experimental workshop in insect identification five years ago, the event was so popular with students and agricultural professionals that I've been doing workshops on different insect groups ever since. This year I gave a three-day short course in identifying families of microhymenoptera in the Santo Domingo INIAP research station. Fifteen students attended from two universities and four different INIAP stations.



Students in the microhymenoptera workshop.

Biomonitoring in the Quevedo area

Norma Guerrero, an environmental science student at the Universidad Técnica Estatal de Quevedo, was my graduate student during the sabbatical. Her thesis project was a study of four small streams around the city of Quevedo, and how different biomonitoring metrics performed in evaluating the water quality of these streams. Last month Norma defended her thesis and received her degree of Ingeniera.

IPM Action in Western Ecuador: A Letter from Wills.

During my recent sabbatical in Ecuador, I was able to participate in a wide spectrum of activities, from SCUBA diving in the Pacific to a trip down the Amazon to the eastern border of the country. More prosaic but more important and almost as much fun were opportunities to get involved in IPM-related activities. Three are described below.

Fear no Weevil: When I first started visiting Ecuador I heard about the country's massive water hyacinth problem in its western reservoirs. From Dr. O'Brien I had learned years ago that two weevils are effective control of this aquatic weed, and one of the weevils was originally described from—wait for it—Ecuador (but the Amazon side). So I was wondering if those two weevils also occurred on the Pacific side, and if so, why was water hyacinth a problem there? In October I was able to (sort of) answer the question. I was invited to visit Represa La Esperanza, a long narrow reservoir in Manabí province, not far from the Pacific Ocean. My hosts were from a private company that was clearing the water of weeds by using long cables to drag the weeds up onto the shore where they were burned. We had no trouble locating adults

2009-2010 Scientific Publications

- Fanigliulo, A., S. Comes, R. Pacella, A. Crescenzi, M. T. Momol, S. M. Olson, and S. Reitz. 2009. Integrated management of viral diseases in field-grown tomatoes in southern Italy. *Acta Horticulturae* 808: 387-392.
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Awards & Honors

- FAMU-CESTA-Center for Biological Control. 2010 Friends of Southern IPM Pulling Together Award. Presented by the Southern IPM Center, April 9, 2010. Recipients of the award were Drs. Moses Kario, Raymond Hix, Wills Flowers, Muhamad Haseeb, Stuart Reitz, Stephen Hight, and Susie Legaspi.
- Antonio Francis received 2nd place for the Presidents prize for the oral presentation, "Field assessment of two encyrtid parasitoids of *Planococcus minor* (Maskell) in Trinidad". 57th Annual Meeting of Entomological Society of America, held in Indianapolis, IN, USA, December 13-16, 2009
- Dr. Raymond Hix: Best in Show, Best Photomicrograph and Best Traditional Macro, Southeastern Branch-Entomological Society of America Photo Salon, March 2010, Atlanta Georgia
- Dr. Raymond Hix: 1st Place Microscopic Photography, 1st Place Insect Biology and 3rd Place Sequence Photography at the 2010 Georgia Entomological Society Photo Salon.

Recent Presentations & Seminars

- Divate, N., and M. Thomas. Economic Impact of Cogongrass on Private non-industrial Forest owners in Florida. Florida Exotic Pest Plant Council 25th Annual Symposium. April 5th to 8th. Crystal River, Florida.
- Divate, N., and M. Thomas. Economic Impact of Cogongrass on Private non-industrial Forest owners in Florida. Center for Natural Resource Economics and Policy, 3rd National forum on Socioeconomic research in Coastal Systems. May 26th - 28th in New Orleans, Louisiana.
- Francis, A. and M. T. K. Kairo. Field assessment of two encyrtid parasitoids of *Planococcus minor* (Maskell) in Trinidad. 57th Annual Meeting of Entomological Society of America, held in Indianapolis, IN, USA, December 13-16, 2009
- Haseeb, M. and M. T. K. Kairo. Digital Identification of Rhynchophorus and Other Weevils That are Serious Emerging Threats to Cultivated Palms.

Poster presented at the 57th Annual Meeting of Entomological Society of America, held in Indianapolis, IN, USA, December 13-16, 2009

Haseeb, M., R.W. Flowers and M. T. K. Kairo. Development of electronic identification resources in support of food and bio-security. Talk presented at the 45th Annual meeting of the Caribbean Food Crops Society, held in Frigate Bay, Saint Kitts & Nevis, July 12-17, 2009

Haseeb, M. and M. T. K. Kairo. Weevils of Cultivated Palms in the United States and Caribbean Countries. Poster presented at the 93rd annual meeting of Florida Entomological Society, held in Jupiter, Florida, USA, July 25-28, 2010

Kariuki, E. M., R. L. Hix, S. Reitz, S. Hight and M.T. Kairo. Tropical soda apple (*Solanum viarum*) mediated competition via induced resistance: Interaction between *Gratiana boliviana*, *Spodoptera exigua* and *Frankliniella occidentalis*. Poster presented at the 84th Annual Meeting of the Southeastern Branch, Entomological Society of America, held in Atlanta, Georgia, USA, March 7-10, 2010

Kariuki, E. M., R. L. Hix, S. Reitz, and S. Hight. Does tropical soda apple (*Solanum viarum*) mediate interactions between *Gratiana boliviana*, *Spodoptera exigua* or *Frankliniella occidentalis* via induced resistance? Poster presented at the 57th annual meeting of Entomological society of America, held in Indianapolis, Indiana, USA, December 13-16, 2009

Legaspi, J. Life history trade-offs and biochemical assessment of reproductive fitness of the spined soldier bug, *Podisus maculiventris*. Graduate Student Seminars, Department of Entomology, University of Florida, Gainesville, FL, September 2009

Legaspi, J. C. and N. W. Miller. Evaluating silverleaf whitefly oviposition on giant red mustard and other vegetable crops. SEB-Entomological Society of America Annual Meeting, Atlanta, GA, March 3-7, 2010

Legaspi, J. C., C. Gardner, G. Queeley, N. Leppla, and J. Cuda. Demonstrating integrated pest management of hot peppers. Integrated Pest Management Symposium, Portland, OR, March 24-26, 2009

Legaspi, J. C. N. W. Miller, and K. Marshall, Jr. Silverleaf whitefly reproduction and development on giant red mustard and other vegetable crops. 10th Anniversary Symposium and Open House, Center for Biological Control, Florida A&M University, Tallahassee, FL, April 9, 2010

Legaspi, J.C., I. Baez, J. Head, M. Soumare, C. Gardner, G. Queeley, J. Cuda and N. Leppla. Integrated pest management of hot peppers: a sustainable approach for resource-limited producers. 10th Anniversary Symposium and Open House, Center for Biological Control, Florida A&M University, Tallahassee, FL, April 9, 2010

Reitz, S. From small things big things one day come: Perspectives on thrips ecology. Department of Entomology and Nematology, University of Florida, Gainesville, FL. January 2010

Reitz, S. Integrating integrated pest management. Symposium Celebrating Stern et al. (1959): The Past, Present, and Future of IPM. Annual Meeting of the Entomological Society of America, Indianapolis, IN, 2009

Reitz, S. Predator-prey Interactions between *Orius insidiosus* and Flower Thrips. Symposium on New Perspectives on Density-dependence in Thrips. IX International Symposium on Thysanoptera and Tospoviruses. Gold Coast, Australia. 2009

Said, R., R. L. Hix, and S. Reitz. Biological Control Of The Grape Root Borer (Lepidoptera: Sesiidae) in "Cynthiana" Grapes. Oral presentation held in Indianapolis for the ESA annual meeting on December 12, 2010

Said, R., R. L. Hix, and S. Reitz. Biological Control Of The Grape Root Borer (Lepidoptera: Sesiidae) in "Cynthiana" Grapes. Oral presentation held in Atlanta, Georgia for the ESA South branch meeting on April 16, 2010

Said, R., R. L. Hix, and M. T. K. Kairo. How Do Soil Parameters Affect Heterorhabditis Bacteria Viability for the Biological Control of the Grape Root Borer (*Vitacea polistiformis*) in Muscadine Vineyards? Poster held at ESA annual meeting in Reno, Nevada on November 24

Williamson, J., A. Somorin, M. Haseeb, and M.T.K. Kairo. Susceptibility of Southern Green Stink Bug, *Nezara viridula* (L.) to different isolates of the mycopathogen, *Beauveria bassiana* under laboratory conditions. Poster presented at the 93rd annual meeting of Florida Entomological Society, held in Jupiter, Florida, USA, July 25-28, 2010

Popular Press Articles

"Florida Biological Control Team Receives Friends of IPM Award on 10th Anniversary". Southern IPM Center – Southern Exposure, Summer 2010, Vol. 7, Issue 1, p. 1-2.

"ARS, APHIS and Florida A&M University Receive Team Award". USDA, ARS Colors of Success Newsletter, July 2010 Special edition, p. 17.

Training & Workshops Attended

Legaspi, J. C. Science Technology and Public Policy Seminar. Eastern Management Development Center, Shepherdstown, WV, Feb. 22 – March 4, 2010

Legaspi, J. C. 25th National Leadership Training Conference. Federal Asian Pacific American Council. National Harbor, MD, May 3-7, 2010

Legaspi, J. C. Wilderness First Aid, May 18, 2009

Miller, N. W. Whitefly parasitoid identification with systematist, Dr. G. Zolrenowich, Kansas Stae University, Kansas, July 13-15, 2010

Continuing Education and Outreach

Monarch Butterfly Festival, Entomology Club, October 2010

FAMU – CESTA, Entomology Club mentoring, Walker Ford Community Center – after-school program, spring 2010

FAMU Grape Harvest Field Day, August 22, 2010

Farm Fest 2010

Tour of laboratories – elementary and middle-school students from Atlanta, GA, spring 2010 and Dr. Alvin Culaba and students, De La Salle University, MetroManila, Philippines, July 29, 2010

FAMU Entomology Field Day and Capelouto Foundation Scholarship awards, November 2009

Legaspi, J. C., Member, Nominating Committee, SEB-Entomological Society of America Meeting, 2009

Judge, Student paper competition, FAMU-CESTA organized by L. Kanga, – Student Colloquium, March 16, 2010

Sustainable communities summit organized by Leon County, Florida May 6-7, 2010

Trainings/Workshops/Field Days

- 1) ARS/UF-IFAS/FAMU Workshop. To Enhance Partnership and Develop Successful NIFA Grant Proposals in Arthropod Pests of Plant and Animal Systems. Organized by ARS/UF, IFAS and FAMU, held at Gainesville, Florida, USA, August 25, 2010
- 2) USDA, APHIS, Palm Resource Workshop IV. Pests and Diseases of Palms Cultivated in the United States and Caribbean: Identification Keys to Palms and Their Pests, Diseases, and Disorders. Organized by the Center for Plant Health Science and Technology and FDACS, DPI and University of Florida, IFAS, held at Gainesville, FL, USA, January 3-4, 2010
- 3) W.L. Peters, 33rd Annual Field Day and Workshop organized by Entomology program, College of Engineering Sciences, Technology and Agriculture, FAMU in cooperation with the Division of Education, Tallahassee-Leon County Civic Center, Florida, USA, November 4-6, 2009
- 4) Miller, N.W. Biological Control and IPM strategies against insect pests in vegetables and horticulture crops. Sustainable farming and transitioning to organics workshops coordinated by Florida Organic Growers Association and FAMU Small Farm Cooperative Extension Program. Crescent Moon Farm, Spochopy, FL, March 26 and June 5, 2010
- 5) Flowers, R.W. and M. Haseeb. 2010. Diagnostician Training – Caribbean Pest Diagnostic Network (CPDN), sponsored by T-STAR project entitled "Building Technical and Institutional Policy Support Platform for an Effective US/Caribbean Basin Invasive Species Safeguarding System" Training session on Economically Invasive Weevil Species of Caribbean Importance, held at University of Florida, IFAS, Extension, Gainesville, Florida, June 12-19, 2010
- 6) Survey and collection for ambrosia beetles on redbay plantations in South Carolina, Georgia and Florida, funded by the USDA, ARS, July 12-15, 2010

Appreciation Presentations at the CBC 10 Year Symposium



Dr. Ed Knipling (Administrator, USDA-ARS) receives a plaque from Dean Makola Abdullah in appreciation to the USDA-ARS for its support of the CBC.



Dr. Ken Bloem receives a plaque from Dean Makola Abdullah in appreciation to the USDA-APHIS for their support of the CBC.



Dr. Deborah Brennan, ARS Regional Director SAA receives a plaque from Dean Makola Abdullah in appreciation to the USDA-ARS South Atlantic Area Office for its support of the CBC.



Dr. John Sivinski receives a plaque from Dean Makola Abdullah in appreciation of the support received by CBC from the USDA-ARS Center for Medical, Agriculture and Veterinary Entomology.



Dr. Makola Abdullah presents a plaque to Mr. Raymond Capelouto on behalf of the Reuben Capelouto Foundation for their support of the CBC in the form of numerous scholarships to graduate and undergraduate students.



Dr. Adullah presents a plaque on behalf of the CBC to Dr. Norm Leppla, Chair of the CBC Advisory Council in appreciation for his outstanding service and leadership.



Dr. Abdullah presents a plaque on behalf of the CBC to Dr. Ken Bloem, for outstanding service as a member of the CBC Advisory Council.



Dr. Abdullah presents a plaque on behalf of the CBC to Ms. Abbie Jo Fox, for outstanding service as a member of the CBC Advisory Council.



Dr. Abdullah presents a plaque on behalf of the CBC to Dr. Catherine Marzolf, for outstanding service as a member of the CBC Advisory Council.



Dr. Abdullah presents a plaque on behalf of the CBC to Dr. John Sivinski, for outstanding service as a member of the CBC Advisory Council.



Dr. Abdullah presents a plaque on behalf of the CBC to Mr. Charles Mellinger, for outstanding service as a member of the CBC Advisory Council.



Dr. Abdullah presents a plaque on behalf of the CBC to Dr. Jennifer Taylor, for outstanding service as a member of the CBC Advisory Council.



Dr. Abdullah presents a plaque on behalf of the CBC to Dr. Trevor Smith, for outstanding service as a member of the CBC Advisory Council.

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) or Moses Kairo (Moses.Kairo@FAMU.EDU).

Website Links:

FAMU: <http://www.famu.edu/index.cfm?a=cesta&p=CenterforBiologicalControl>
USDA-ARS: www.ars.usda.gov/saa/cmave/ibbru

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