FLORIDA ENTOMOLOGICAL SOCIETY
94TH ANNUAL MEETING PRESENTATION ABSTRACTS
(Some with Spanish translation)

Posters

DSP1

***Candidatus* Liberibacter asiaticus Infection Modifies Host Preference of *Diaphorina Citri* Kuwayama (Hemiptera: Psyllidae) Via Mechanisms Which May Enhance Transmission.**

Hermann, Sara L., Mann, R.S., Ali, J.G., Tiwari, S., Pelz-Stelinski, K., Alborn, H.T., and Stelinski, L.L. University of Florida Entomology and Nematology Department Citrus Research and Education Center (IFAS-CREC) 700 Experiment Station Road, Lake Alfred, FL 33850. slhermann@mail.usf.edu

Transmission of plant pathogens by insects is a complex process involving interactions between the plant, insect and pathogen. Experiments evaluated how *Candidatus* Liberibacter asiaticus infection influenced *D.citri* host selection. Two-choice bioassays, settling experiments, nutrient analysis and headspace volatile collections evaluated plant status and *D.citri* behavior. Collectively, our results indicate *D.citri* preference behavior may be modified by changes associated with bacterial plant infection that alter nutrients and headspace volatiles, ultimately promoting the spread of disease.

DSP2

***Tuta absoluta* (Lepidoptera: Gelechiidae), a Species of Concern to Agriculture in Florida.**

Julieta Brambila. USDA-APHIS-PPQ, P.O. Box 147100, Gainesville, FL 32614.

Tuta absoluta is a small moth from South America that belongs in the Gelechiidae family. It is a primary pest of tomato, causing crop losses up to 100%, but it also feeds on other Solanceous plants, both native and commercial. It entered Europe in 2006 (reported first in Spain in 2008) and spread to the east and south; it now occurs as far east as Iraq and also in some North African countries. In the Americas, *T. absoluta* has been recently found in northern Panama. Surveys in tomato fields are taking place in Florida in 2011 for this pest leafminer. The Cooperative Agriculture Pest Survey Program (CAPS) is leading in this effort in cooperation with various agencies and personnel. As of June 2011 *Tuta absoluta* has not been found in Florida and has not been reported from any other U.S. state. The purpose of this presentation is to explain why this non-native species, also known as the South American Tomato Leafminer, is of such concern that early detection surveys were initiated and to present preliminary results of the spring season survey, with a discussion of some findings.

DSP3

Baseline Susceptibility Study for Cyantraniliprole (Cyazypyr™ 20 SC, DPX-HGW86) To Pepper Weevil, *Anthonomus eugenii* Cano (Coleoptera: Curculionidae). Rafael Caballero[1], David Schuster[1], Hugh Smith[1] and Hector Portillo[2] [1] Gulf Coast Research and Education Center, University of Florida. 14625 C.R. 672. Wimauma, FL 3359, rcaballero@ufl.edu. [2] DuPont Crop Protection, Stine-Haskell Research Center. 1090 Elkton Road. Newark, DE 19711.

Cyantraniliprole is a new insecticide in the new Anthranilic Diamides class with a novel mode of action. The baseline was developed with a susceptible laboratory colony of pepper weevil using pepper seedlings and a systemic bioassay. As a comparison, thiamethoxam was used. Cyantraniliprole and thiamethoxam inhibited daily feeding, showing a pooled LC_{50} and slope values of 2.12690 mg ai L^{-1} and 1.4318 and 0.45263 mg ai L^{-1} and 3.7971 after seven days of exposition, respectively.

DSP4

***Calophya latiforceps*, a New Species of Jumping Plant Lice (Hemiptera: Calophyidae) Associated with *Schinus terebinthifolius* (Anacardiaceae) in Brazil.** D. Burckhardt, J. P. Cuda, V. Manrique, R. Diaz, W. A. Overholt, D. A. Williams, L. R. Christ, And M. D. Vitorino. University of Florida, Department of Entomology & Nematology, P. O. Box 110620, Gainesville, FL 32611-0620. jcuda@ufl.edu

A new species of leaflet galling psyllid was discovered attacking Brazilian peppertree in Bahia, Brazil in March 2010. A formal morphological description of new psyllid *Calophya latiforceps* sp. nov. (Hemiptera: Calophyidae) was prepared along with molecular evidence confirming new species designation. This previously unknown natural enemy may have potential as a biological control agent for Brazilian peppertree.

DSP5

Thrips Species in Wheat Production Areas of Lakes District of Turkey. Ozan Demirözer, Joseph Funderburk, and Mrittunjai Srivastava. North Florida Research and Education Center, 155 Research Road, Quincy, FL 32351-5677. odemirozer@ufl.edu

Lakes district is located in west part of the Mediterranean region of Turkey and it covers provinces of Antalya, Burdur and Isparta. In this study, we aimed to determine Thrips species in wheat production areas of lakes district due to keep in different habitats within. Samples were collected in between 15th May to 23rd June of 2010 (beginning of milk stage to the grain period of ears) from 50 different fields and altitudes (800-1200m) and 100 ears were collected from each field. In this study *Aeolothrips intermedius* Bagnall, *A. collaris* Priesner, *Frankliniella tenuicornis* (Uzel), *Haplothrips tritici* (Kurdjumov), *Limothrips denticornis* Haliday, *Sitothrips arabicus* Priesner, *Thrips angusticeps* Uzel were determined. Result of the study *Haplothrips tritici* (Kurdjumov) was found to be the main species in all sampling areas.

DSP6

Efficacy of Essential Oil Lures for Detection of Redbay Ambrosia Beetle, *Xyleborus glabratus* (Coleoptera: Curculionidae: Scolytinae). Paul E. Kendra, Jerome Niogret, Wayne S. Montgomery, Jorge S. Sanchez, Jorge E. Peña, Nancy D. Epsky, and Robert R. Heath. USDA-ARS, Subtropical Horticulture Research Station, 13601 Old Cutler Rd., Miami, FL 33158. paul.kendra@ars.usda.gov

The redbay ambrosia beetle (RAB) is a wood borer that vectors laurel wilt, a lethal vascular disease of trees in the Lauraceae, including avocado. Field tests and chemical analyses were conducted with commercial lures of manuka oil and phoebe oil to (1) compare efficacy of lures for capture of RAB, (2) compare captures in Lindgren funnel traps versus sticky traps, (3) evaluate lure longevity in Florida, and (4) determine release rates of putative attractants.

DSP7

Scolytinae (Coleoptera: Curculionidae) Inhabiting Avocado (*Persea americana*) in Florida. R. E. Duncan , M. Thomas, G. Brar, S. McLean and J. E. Pena. University of Florida, Tropical Research and Education Center, 18905 SW 280th Street, Homestead, FL 33031. red@ifas.ufl.edu

During the last 3 years, logs of avocado as well as trees infested by scolytinae have been collected in Florida. Logs or portions of avocado trunks have been placed in emergence cages/boxes and held for 2-5 months under laboratory conditions. Scolytinae emerging from *P. americana* have been either identified by RED or sent to identification by MT at FDOACS, Entomoloy. Here we present a summary of the species emerging from avocado and compare the frequency of the species with those emerging from *P. borbonia* and *P. pallustris*.

DSP8

Chemical Control of Scolytinae (Coleoptera: Curculionidae) Infesting Avocado (*Persea americana*) in Florida. J. E. Pena, R. E. Duncan , R. Cave , Jonathan H. Crane , Paul Kendra and J. Capinera. University of Florida, Tropical Research and Education Center, 18905 SW 280th Street, Homestead, FL 33031. red@ifas.ufl.edu

Three trials were undertaken to determine the effectiveness of insecticides against Scolytinae infesting avocado between 2010 and 2011. These included contact and systemic insecticides applied either to trees or to avocado logs. Efficacy of the insecticides was determined either by the number of entrance holes into logs or trees or by emergence of scolytinae from treated and untreated logs/trees. The effectiveness of the treatments is discussed.

DSP9
Effectiveness of Surfactants and Physical Control of *Brevipalpus phoenicis* Infesting Lemons. Ignacio Baez, M. Hennessey, K. Santos, D. Carrillo, R. E. Duncan and Jorge E. Pena University of Florida, Tropical Research and Education Center, 18905 SW 280th Street, Homestead, FL 33031. red@ifas.ufl.edu

Brevipalpus phoenicis (Acarina: Tenuipalpidae) as vector of citrus leprosies is feared as an invasive species Several trials were undertaken to determine the effectiveness of surfactants, soaps and brushing against Brevipalpus phoenicis infesting post harvested lemons. The effectiveness of the treatments is discussed.

DSP10
Choice Tests of Silverleaf Whitefly, *Bemisia tabaci* B Biotype, on Zucchini Squash and Buckwheat and the Effect of *Delphastus Catalinae* on Whitefly Population Densities. Janine Razze and Oscar E. Liburd. University of Florida, Entomology and Nematology Department, Bldg. 970 Natural Area Drive, PO Box 110620, Gainesville, FL 32611. jrazze@ufl.edu

Zucchini squash is susceptible to feeding damage from immature silverleaf whiteflies. This study investigated preference of the silverleaf whitefly between zucchini squash and buckwheat, and how *Delphastus catalinae* affected whitefly populations. More whiteflies were recorded on zucchini squash compared with buckwheat. Fewer whiteflies were observed in the cage with *D. catalinae* compared with other treatments. Our findings suggest that the implementation of an alternative host and *D. catalinae* can be used to suppress whitefly populations.

DSP11
Potential Attractants for the Redbay Ambrosia Beetle (*Xyleborus glabratus* Eichhoff). Elena M. Rhodes. University of Florida, North Florida Research and Education Center, 155 Research Road, Quincy, FL 32351-5677. erhodes@ufl.edu

The redbay ambrosia beetle (RAB) was first detected in Florida in 2005. The fungus they carry causes laurel wilt, which kills members of the family Lauraceae. The purpose of this study was to screen various essential oils singly and in combination to determine if they are attractive to RAB. Calamus oil was not statistically different from manuka oil on 2 out of 5 sampling dates. Combining treatments with camphor oil did not increase trap catch.

DSP12
Development of a Pest Management Decision Support System for the Management of Ornamental Plants. Alfredo Rios, Luis Cañas, Christopher Ranger, Michael Reding, Randall Zondag, and Heping Zhu. OARDC/Entomology Department, The Ohio State University, 1680 Madison Avenue, Wooster 44691. rios.43@osu.edu

Nurseries and greenhouses throughout the US produce large numbers of ornamentals resulting in systems with a wide diversity of plants and pests. This requires that growers make complex decisions to select the best management programs against pest complexes. We report on the

design and implementation of a USDA-Ohio State University decision support system aimed at simplifying growers' pesticide selection and evaluation and on the potential constraints for the adoption of pest management decision support systems.

DSP13
Evaluation of *Metarhizium anisopliae* Strains to Control the Grass Spittlebug *Prosapia* sp.
Osvaldo Avalos-de León, Jesús M. Villegas-Mendoza, Alejandro Sánchez-Varela, and Ninfa M. Rosas-García. Centro de Biotecnología Genómica, Instituto Politécnico Nacional Blvd., Del Maestro s/n esq. Elías Piña Colonia Narciso Mendoza CP 88710, Reynosa Tamaulipas, México. nrosas@ipn.mx; ninfarosasg@yahoo.com.mx

The grass spittlebug is a very important pest in nine Mexican states. *Metarhizium anisopliae* has offered good results in controlling this pest. So in this work the collection strains 798, 3019 and 6347 demonstrated to kill adults of *P. simulans*. Interesting results are observed when protease production to degrade insect cuticle and protease gene contents are related to fungus killing abilities and also considered as pathogenic factors.

DSP14
Management of Western Flower Thrips on Pepper and Tomato in North Florida.
Mrittunjai Srivastava, J.E. Funderburk, Ozan Demirözer, and Steve Olson. North Florida Research and Education Center, IFAS, University of Florida, 155 Research Road, Quincy, FL 32351-5677. mrittunjai@ufl.edu

Among the several factors attributed to low productivity, damage of crop due to western flower thrips is substantially important. Research has been conducted at the North Florida research and education center, Quincy, Florida in 2008, 2009, and 2010 to gain an understanding of flower thrips population dynamics in pepper and tomato. This information coupled with insecticide efficacy studies has allowed us to direct recommendations for managing these serious pests. Present studies provide guidelines for growers in making management decisions.

DSP15
Evaluation of Insecticidal Peptides against Phloem Feeding Citrus Pests.
Kirsten S. Pelz-Stelinski, Harsimran K. Gill, Gaurav Goyal, and Siddarme Gowda. Citrus Research and Education Center, 700 Experiment Station Rd,Lake Alfred, FL 33850. pelzstelinski@ufl.edu

Transgenic crops expressing insecticidal peptide genes have been successful in increasing plant resistance to insect pests. Currently, we are investigating citrus tristeza virus (CTV) engineered to express insecticidal peptides as a novel tool for control of two important citrus pests: the Asian citrus psyllid (ACP), *Diaphorina citri*, and the brown citrus aphid.

DSP16
RNA Interference Reduces Viral Disease. Wayne B. Hunter, Rohan Reddy, and Xiomara H. Sinisterra. USDA, ARS, U.S. Horticultural Research Lab, 2001 South Rock Road, Fort Pierce, FL, 34945. Wayne.hunter@ars.usda.gov

RNA interference, RNAi, successfully reduced virus replication, resulting in improved growth and cell health. The dsRNA's were made to the virus capsid of an insect-infecting, single, stranded RNA virus, ssRNA, which was co-inoculated onto cell cultures. Cell lines established from leafhoppers (Hemiptera: Cicadellidae: *Homalodisca vitripennis*) were used as a model system to examine RNAi applications for the treatment of viral diseases.

La interferencia ARN (ARNi) redujo de manera efectiva la replicacion viral in celulas de modo que incrementos en crecimiento y mejoras en salud fueron observados. El ARN de doble cadena (dsARN) fue disenado para afectar el gen de la capside del virus, el cual posee un genome compuesto por ARN de cadena sencilla. El virus fue co-inoculado en cultivos celulares. Lines celulares de salta hojas (Hemiptera: Cicadellidae: *Homalodisca vitripennis*) se usaron como modelos para examinar las posibles aplicaciones de la interferencia ARN para tratar infeciones virales

DSP 17
Psyllid Genome Analysis Reveals Unique Features for Designing Specific Control Strategies. Wayne B. Hunter and Blake R. Bextine. USDA, ARS, U.S. Horticultural Research Lab, 2001 South Rock Road, Fort Pierce, FL, 34945. Wayne.hunter@ars.usda.gov

Genomics of psyllids has opened the door for the development and application of RNA interference strategies aimed at reducing psyllid populations in citrus and potato crops. Successful feeding of dsRNA made to psyllid genetic transcripts were shown to reduce transcript levels and increased psyllid mortality. Commercialization of dsRNA's and a broader understanding of the specificity of RNAi suggest that RNAi strategies have a place in insect pest management.

La genómica de psílido ha abierto la puerta para el desarrollo y aplicación de estrategias de interferencia de ARN para reducir las poblaciones del psílido de los cítricos y los cultivos de papa. Alimentación exitosa de dsARN complemetarios al los transcritos del psílido mostraron una reducción de los niveles de transcripción y el aumento de la mortalidad del psílido. Comercialización de dsARN y una mayor comprensión de la especificidad de ARNi sugieren que las estrategias ARNi tienen un lugar en el manejo de plagas de insectos. [Xiomara H. Sinisterra, Ph.D.]

DSP18
dsRNA Movement from Rootstock to Scion in Citrus Trees. Wayne B. Hunter, Blake R. Bextine, Ed Stover, and Xiomara H. Sinisterra. USDA, ARS, U.S. Horticultural Research Lab, 2001 South Rock Road, Fort Pierce, FL, 34945. Wayne.hunter@ars.usda.gov

This study demonstrates the movement of dsRNA molecules from rootstock to scion, supporting further development of RNA interference, RNAi, strategies to protect citrus trees and other

woody crops, like grapevines. RNAi was shown to successfully reduce psyllid and leafhopper survival rates. Movement of dsRNA molecules which were evaluated were of varying lengths from 140 to 850 bases. Absorption by plants, plantlets and cuttings were influenced by pH, as well as concentrations. Characterization of dsRNA movement through plants and insects advances the understanding and applications of RNAi strategies under real world production systems.

Este estudio demuestra el movimiento de las moléculas de dsARN desde ela raíces hasta lose patrones de injerto, apoyando a un mayor desarrollo de las estrategias de interferencia de ARN, el ARNi, para proteger los árboles de cítricos y otros cultivos leñosos, como la vid. ARNi ha demostrado que puede reducir con éxito las tasas de supervivencia de los psílidos y saltahojas. las moléculas de dsRNA evaluadas fueron de diferentes longitudes desde 140 hasta 850 bases. La absorción por las plantas, plántulas y esquejes fue influenciada por el pH, y las concentraciones. La caracterización del movimiento de dsARN en plantas e insectos incrementa la comprensión y la aplicación de estrategias de ARNi en condiciones reales de producción. [Xiomara H. Sinisterra, Ph.D.]

DSP19

Systemic RNA interference, RNAi, in Hemiptera: Psyllids and Leafhoppers Pests of Citrus and Grapevines. Wayne B. Hunter, Blake R. Bextine, and Xiomara H. Sinisterra. USDA, ARS, U.S. Horticultural Research Lab, 2001 South Rock Road, Fort Pierce, FL, 34945. Wayne.hunter@ars.usda.gov

Evidence supports a systemic movement of dsRNA molecules in psyllids and leafhoppers. Movement of dsRNA molecules ingested by two psyllid species which are vectors of Liberibacter species of bacteria; Asian citrus psyllid, *Diaphorina citri*, and potato psyllid, *Bactericera cockerelli*, and the glassy-winged sharpshooter leafhopper which vectors of Pierce's disease of grapevine, *Homalodisca vitripennis*, all demonstrated movement of dsRNA's into the gut cells, hemolymph and then tissues and organs distal from the midgut, supporting a systemic RNAi hypothesis. Understanding the movement of dsRNA through plants and insects advances the understanding and applications of RNAi strategies.

La evidencia apoya la existencia de movimiento sistémico de las moléculas de dsARN en psílidos y chicharritas. El movimiento de las moléculas de dsRNA ingeridos por dos especies de psílidos, vectores de diferentes especies de la bacterias Liberibacter; (El psílido asiático de los cítricos, Diaphorina citri y psílido de la papa Bactericera cockerelli), y la chicharrita de alas cristalinas el cual es el vector de la enfermedad de Pierce de la vid, (Homalodisca vitripennis), fue demostrado por la presencia de dsARN en células del intestino, la hemolinfa y tejidos y órganos distales del intestino medio. Comprender el movimiento de dsRNA a través de las plantas e insectos ayuda de manera importante a la comprensión y aplicación de estrategias de RNAi. [Xiomara H. Sinisterra, Ph.D.]

SYMPOSIUM: **Invasive Species: Are We Communicating?**

Organizers: **Lance Osborne,** University of Florida-IFAS, MREC, **Amanda Hodges,** University of Florida-IFAS, **and Stephanie Stocks,** University of Florida-IFAS

10:00 [1]
Introduction: **Remarks and Lessons Learned from Past Introductions.** Lance Osborne. University of Florida-IFAS, MREC, Apopka, FL 32703.

No Abstract.

10:18 [2]
An Opinion from the Ornamental Industry. Lin Schmale. Society of American Florists, Alexandria, VA 22314.

No Abstract.

10:36 [3]
Responding to Exotic Species in Florida-a State Perspective. Wayne Dixon, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, FL 32608.

No Abstract.

10:54 [4]
Research Needs for Invasive Species in Florida, (*Bemisia tabaci,* Q biotype). Cindy McKenzie. US Horticultural Research Lab, ARS, USDA, Ft. Pierce, FL 34945.

No Abstract.

11:12 [5]
Reaching Traditional and Non-Traditional Clientele. Amanda Hodges and Stephanie Stocks. University of Florida-IFAS, Gainesville, FL 32611.

No Abstract.

Monday Afternoon, July 25th

SYMPOSIUM-INDUSTRY: **Advances in Vegetable Entomology Research in Florida: a Tribute to the Research Programs of Dr. Dave Schuster**

Organizers: **Joe Eger,** Dow AgroSciences, **Jim Price,** University of Florida – IFAS, GCREC, Wimauma, and **Scott Ferguson,** Atlantic Turf & Ornamental Consulting

1:15 [6]
Entomologist David Schuster: A Leading Partner to Florida's Vegetable Industry. Jack Rechcigl, University of Florida – IFAS, GCREC, Wimauma, FL.

No abstract.

1:35 [7]
Twenty Two Years Fighting Whiteflies. Phil Stansly, University of Florida – IFAS, SWREC, Immokalee, FL.

No abstract.

1:55 [8]
Spatial Statistics and Geographical Information Systems (GIS) for Studying *Bemisia tabaci* and *Tomato Yellow Leaf Curl Virus,* a Fishing or Catching Expedition? James "Shine" Taylor, University of Florida – IFAS, GCREC, Wimauma, FL.

No abstract.

2:35 [9]
From Pepper Weevil to Fishing: Lessons for Life. Marco Toapanta, Syngenta Vegetables, Kansas City, MO.

No abstract.

2:55 [10]
Whiteflies in Tomatoes: A Florida Perspective. Cindy McKenzie, US Horticultural Research Lab, ARS, USDA, Ft. Pierce, FL.

No abstract.

3:15 [11]
Dave Schuster: Partnering with Industry from Discovery to Practical application. Tony W. Weiss, Dow AgroSciences, Brandon, FL.

No abstract.

3:35 [12]
Thirty Three Years of Fruitful and Memorable Collaborations—Thank You, Dave. Galen Frantz and H. Charles Mellinger, Glades Crop Care, Jupiter, FL.

No abstract.

Student Competition (2:35-5:03), Concurrent Session

PhD

2:40 [13]
Manipulating Entomopathogenic Nematodes with Belowground Herbivore Induced Plant Volatiles Increases Mortality of Root Weevil. Jared Gregory Ali, Hans T. Alborn, Raquel Campos-Herrera, Larry Duncan, Inna Kuzovkina and Lukasz L. Stelinski. University of Florida, Entomology and Nematology Department, Citrus Research and Education Center (IFAS-CREC), FL 33850. Jgali@ufl.edu

In response to herbivore feeding, damaged plants release odors that attract natural enemies of herbivorous insects. This interaction has been thoroughly examined aboveground. It has become increasingly evident that similar interactions occur belowground. We demonstrated that Citrus roots fed upon by, root-weevils (*Diaprepes abbreviatus*) release a volatile that attracts EPNs in multiple bioassays. Isolation, identification, and deployment of this chemical in the field increased larval mortality by attracting EPNs.

2:53 [14]
Stimuli Inducing Movement of ACP, *Diaphorina citri.* Scott Croxton and Dr. Phil Stansly South West Florida Research and Education Center, University of Florida, 2685 SR 29 N, Immokalee, FL 34142. croxtsd@ufl.edu

The Asian Citrus Psyllid (ACP), *Diaphorina citri*, is considered to be the single most serious threat to citrus production. An in depth understanding of the movement behaviors of the ACP would enable growers to target current control methods for maximum effect. We tested the response to multiple colors of light, olfactory stimuli, physical objects that resemble host plants, air movement and combinations of these stimuli to determine their impact on ACP movement patterns.

3:06 [15]
Adaptation of Native Generalist Larval Endoparasitoids to an Invasive Host. Henry Murillo, David Hunt and Sherah L. VanLaerhoven. University of Windsor, Biology Department, Insect Ecology & Behaviour Lab, 401 Sunst Ave, Windsor, ON, Canada. N9B 3P4. murillo@uwindsor.ca

In the study of the adaptation of native larval endoparasitoids to an invasive host, the food web of the native *Trichoplusia ni* and invasive *Chrysodeixis* sp. in southwestern Ontario Canada shows that *T. ni* has been displaced and that most of the *T. ni* larval parasitoids have expanded their host range into the new *Chrysodeixis* species. *Campoletis sonorensis*, *Cotesia plathypenae* and *Cotesia marginiventris*, the most common larval parasitoids found in the invasive species, display crop preferences.

En el estudio de la adaptación de endoparasitoides de larva nativos a un hospedero invasor, la red alimentaria de *Trichoplusia ni* (Nativo) y *Chrysodeixis* sp (invasor) en el suroeste de Ontario,

Canadá muestra que *T. ni* ha sido desplazado y que la mayoría de los parasitoides de larvas de *T. ni* han ampliado su rango de hospederos en *Chrysodeixis* sp. *Campoletis sonorensis*, *Cotesia plathypenae* y *Cotesia marginiventris*, los parasitoides de larvas más comunes encontrados en la especies invasora, presentan preferencias por determinados cultivos.

3:19 [16]
Effect of Using Sustainable Growing Practices on Spider Mites, Insect Pests and Marketable Yields of Strawberries. T. W. Nyoike and O. E. Liburd. Entomology & Nematology Dept., University of Florida, Bldg 970 Natural Area Drive, Gainesville, FL 32611. nyoiket@ufl.edu

Two field experiments were conducted to evaluate the effect of pruning old leaves on strawberry transplants, re-using plastic mulch and planting directly into strawberry thatch on strawberry production. Twospotted spider mites, insect pests and beneficial insect populations were monitored biweekly as well as marketable yields. Results show that pruning older leaves promoted vigorous plants and higher yields, whereas leaving old plants did not affect strawberry arthropod populations and marketable yields.

3:32 [17]
Development of an IPM Program for the Tropical Sod Webworm *Herpetogramma phaeopteralis* Guenée (Lepidoptera: Crambidae: Spilomelinae). Nastaran Tofangsazi, Steven Arthurs, Eileen Buss and Rob Meagher. Mid-Florida Research and Education Center, University of Florida, 2725 Binion Rd, Apopka, FL 32703. ntsazi@ufl.edu

Herpetogramma phaeopteralis is an important turfgrass pest in Florida and there is a need for effective alternative management strategies. I will describe aspects of my proposed research including the use of microbial control agents, namely entomopathogenic nematodes and fungi, as potential tools to manage the damaging larval stages of *H. phaeopteralis*.

3:45 [18]
Stochastic Simulation of Termite Dispersal in a Homogeneous Environment Using an Individual-Based Modeling Approach. Francesco Tonini, Rudolf H. Scheffrahn, and Hartwig H. Hochmair. Ft. Lauderdale Research & Education Center - University of Florida11037 SW 139th Place, Miami, FL 33186. ftonini@ufl.edu

Termites are destructive insect pests that cause billions of dollars in property damage every year. Understanding the dynamics and speed of their invasion would assist planners who must assess the impact of these pests on construction practices, landscaping elements, and area-wide management programs. This presentation illustrates a stochastic simulation model to study the dynamics of a termite pest invasion dispersing from a single source point by natural means.

MS

3:58 [19]
Species Complex and Monitoring For Stink Bugs in Blackberries. Sara A Brennan and Oscar E. Liburd. University of Florida Entomology and Nematology Department, 970 Natural Area Drive, PO BOX 110620, Gainesville, FL 32611. sbrennan@ufl.edu

In an investigation of stink bug species complex, we recorded several *Euschistus* spp. as well as *Thyanta custator*. When stink bugs were monitored, pheromone baited yellow pyramid traps captured significantly more *Euschistus* spp. than Trécé tube traps. No differences in attractiveness were found between traps baited with Suterra Scenturion, Trécé and Pherocon lures and unbaited traps. Overall trap catches were low and differences among lure rates were only minimally affected.

4:11 [20]
Complex and Seasonal Incidence of Leafminer Hymenopteran Parasitoids on Beans in South Florida. Jian Li, Dakshina. R. Seal, Gary L. Leibee, and Oscar E. Liburd. University of Florida, Tropical Research and Education Center, 18905 SW 280TH ST, Homestead, FL 33031 18905 SW 280TH ST, jli59@ufl.edu

The complex and seasonal incidence of hymenopteran parasitoids of *L. trifolii* was surveyed on snap beans in south Florida. Three families consisting of 13 species of parasitoids were reared. The parasitoids include *O. dissitus (*Muesebeck*), Diaulinopsis callichroma* (Crawford), *Euopius* sp., *Diglyphus begini* (Ashmead), *D. intermedius* (Girault), *D. iseae* (Walker), *Neochrysocharis* sp., *Closterocerus* sp. (Ashmead), *Chrysocharis* sp., *Zagrammosoma lineaticeps* (Girault), *Z. muitilineatum* (Ashmead), *Pnigalio* sp., and *Haltcoptera* sp.

4:24 [21
Oviposition Substrate Preference and Development Ability of Stable Flies (*Stomoxys calcitrans)* and House Flies (*Musca domestica)* in Common Equine Substrates to Improve Integrated Pest Management for North Florida Small Equestrian Farms. Erika Machtinger, Christopher Geden, Norman C. Leppla and Jerome Hogsette. University of Florida, Entomology and Nematology Department, 970 Natural Area Drive, PO Box 110620, Gainesville, FL 32611. irishtangerine@ufl.edu

Filth flies, such as the house fly (*Musca domestica* L.) and stable fly (*Stomoxys calcitrans* L.), frequently aggregate in great numbers at equestrian farms in Florida. There is a need for information on the most appropriate IPM practices for use in these farms. Six common substrates found on equestrian farms were evaluated to determine the oviposition preference of house flies and stable flies as well as the development ability and times of the immature flies.

4:37 [22]
Studies of Isotope Composition as a Biological Marker in *Lasioderma serricorne.* Lemeisha D. Jones and Rizana M. Mahroof. Department of Biological and Physical Sciences, South Carolina State University, P. O. Box 7365, 300 College Street NE, Orangeburg, SC 29117. rmahroof@scsu.edu

The cigarette beetle, *Lasioderma serricorne* (L.) (Coleoptera:Anobiidae) is associated with various forms of stored food products. We evaluated the carbon and nitrogen isotope composition of adults reared in the laboratory in different hosts. Then adult *L. serricorne* were trapped from various food and feed processing plants in the state of South Carolina using synthetically produced pheromone lures. Once determined the isotope composition in the body signatures of adults collected in stored products environments, the results were compared with the standard laboratory marker to provide host use information in outdoor conditions.

4:50 [23]
Elemental Markers for Stored Products Insects. Daniel S. Clark and Rizana M. Mahroof. Department of Biological and Physical Sciences, South Carolina State University, P. O. Box 7365, 300 College Street NE, Orangeburg, SC 29117. rmahroof@scsu.edu

Significant damage to post harvest commodities occur frequently due to the infestation of cigarette beetle, *Lasioderma serricorne* (F.) (Coleoptera: Anobiidae). The aim of the study was to determine feeding habits of *L. serricorne* by rearing them in different hosts in the laboratory and then evaluate the various elemental compositions in the body of adult insects. Eggs of *L. serricorne* were reared in different hosts and then adults were analyzed for a series of elemental composition. This paper further discusses results of the study and how that information is valuable in pest management.

Tuesday Morning, July 26th

Contributed Papers

8:05 [24]
Experiences on Integrated Pest Management of Coffee Berry Borer CBB in Colombia Luis F. Aristizábal, Mauricio Jiménez, Alex E. Bustillo, and Steven P. Arthurs. University of Florida, Mid-Florida Research and Education Center, Apopka, Fl 32703. larist@ufl.edu

The Coffee Berry Borer CBB, *Hypothenemus hampei* (Coleoptara: Curculionidade) is the most important pest in coffee producers countries. The National Coffee Research Center, in Colombia, Cenicafé, established an IPM program involving monitoring, cultural, biological, and chemical controls. Cultural control through regular harvesting can reduce CBB populations by 80% and is the most important strategy for many small coffee producers. The entomopathogenic fungi *Beauveria bassiana* and three exotic parasitoids are important biological control options.

8:20 [25]
The Bean Plataspid, Coming Soon to Florida? J. E. Eger. Dow AgroSciences, 2606 S. Dundee St., Tampa, FL 33629. jeeger@dow.com.

The bean plataspid *Megacopta cribraria* (Heteroptera: Plataspidae) an Asian stink-bug relative, was first found in the United States in late 2009 in northeastern Georgia. It was associated with kudzu, *Pueraria lobata*, and was invading homes near kudzu patches in large numbers. Although associated mainly with kudzu, it does attack other legumes and is considered a pest of a number of bean crops. Background information on this pest and its current distribution will be presented.

8:35 [26]
Spatial Association of Marine Dockage with Land-Borne Infestations of Invasive Termites (Isoptera: Rhinotermitidae, *Coptotermes*) in Urban South Florida. Hartwig H. Hochmair and Rudolf H. Scheffrahn. University of Florida, Fort Lauderdale Research & Education Center, 3205 College Avenue, Davie, Florida 33314. hhhochmair@ufl.edu

It has long been suspected that two invasive termites, the Formosan subterranean termite (FST), and the Asian subterranean termite (AST), were introduced to South Florida by sailboats. We use spatial analysis to compare distances between 190 terrestrial point records for FST, 177 records for AST, and random locations with the nearest marine dockage. Statisticial results show that AST and FST are significantly closer to potential infested boat locations than random points in these urban areas, which supports the aforementioned hypothesis.

8:50 [27]
Phenology and Management of the Citrus Leafminer *Phyllocnistis citrella* (Lepidoptera: Gracillariidae) in Southwest Florida Citrus. Moneen M. Jones and Phil Stansly. Southwest Florida Research and Education Center, 2685 SR 29 N., Immokalee, FL 34142. mmjones2@ufl.edu

The citrus leafminer causes damage to leaves by larval mining and leads to reduction in photosynthetic capacity, malformation of leaves, and increased susceptibility to citrus canker. To describe the seasonal flight and monitor the effect of various insecticide treatments and applications during the growing season, pheromone traps were set out in spring 2011. Differences between treatments were assessed by sampling leaf damage using a modified Horsfall Barratt rating system and monitoring cumulative moth flight counts.

9:05 [28]
Developing Regulatory Ecosystem Services as IPM Tools: Trap Crops and Other Tactics. Russell F. Mizell, III and T. Charles Riddle. NFREC-Quincy, UF-IFAS, 155 Research Rd, Quincy, FL 32351-5684. rfmizell@ufl.edu.

The ecosystem services (ES) concept is not new but it has not received much attention from entomologists. IPM is rooted in strategies and tactics that aim to prevent and suppress pests

using bio-based manipulations, so the ES concept is readily applicable. Pollination and biological control are regulatory ESs used in IPM. Trap cropping for stink bugs, a related tactic, will be discussed for its potential use in multifunctional plots that provide a number of ESs.

9:20 [29]
Crape Myrtles, *Lagerstroemia indica* and *L. faurei* Are Important But Unknown Pollen Sources for Many Native and Exotic Pollinator Species in the Southern U.S. Russell F. Mizell, III and T. Charles Riddle. NFREC-Quincy, UF-IFAS, 155 Research Rd, Quincy, FL 32351-5684. rfmizell@ufl.edu

Crape myrtles are arguably the most widely-planted non-native ornamental plant species in the southern U.S. Previously, we have demonstrated the importance of this plant species in augmentation of predacious insects. Crape myrtles have large flower spikes that occur through the summer months in a range of colors. Flowers exhibit heteroanthicity and attract a wide range of pollinating insects. Results from a field study examining the Hymenopteran pollinators associated with crape myrtle will be discussed.

9:35 [30]
Thresholds for HLB Vector Control in Infected Commercial Citrus and Compatibility with Biological Control. Cesar Monzo and Philip A. Stansly. Southwest Florida Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida, 2685 SR 29 N., Immokalee, Florida 34142-9515. cmonzo@ufl.edu

Three-year field experiments were initiated 2010 in two commercial orange blocks with high HLB incidence. Experimental design is RCB with 4 replicates and 4 treatments: (1) No insecticide, (2) Calendar applications (3) threshold of 0.2 psyllids/tap, and (4) threshold of 0.7 psyllids/tap. Yield loss will be related to the accumulated number of adults/tap as well as the average HLB titer as estimated using Q-PCR. Beneficial arthropods and secondary pests are also being evaluated by various methods.

10:10 [31]
Augmentative Release of the Parasitic Wasp *Tamarixia radiata* (Hymenoptera: Eulophidae) to Enhance Biological Control of *Diaphorina citri* (Hemiptera: Psyllidae) in Florida. Jawwad A. Qureshi and Philip A. Stansly. University of Florida, Southwest Florida Research and Education Center, 2685 SR 29 N, Immokalee, FL 34142. jawwadq@ufl.edu

Tamarixia radiata, is a species specific ectoparasitoid of *Diaphorina citri* Kuwayama, also known as Asian citrus psyllid (ACP). ACP vectors *Candidatus* Liberibacter asiaticus, a bacterium which causes huanglongbing (HLB) or citrus greening disease, now wide spread in Florida. *T. radiata* has been effective in controlling ACP in the islands of Reunion, Guadaloup and Puerto Rico. Initial releases of *T. radiata* in 1999 were made from a mixed colony imported from Taiwan and South Vietnam. Although a survey in 2006-2007 revealed widespread establishment of *T. radiata* throughout the state, incidence of parasitism was generally low. Therefore, we initiated a mass rearing and release program using the already established

strain and brought in new colonies from Pakistan, South China and North Vietnam. More than 270,000 adults of *T. radiata* from all 4 colonies were released during 2009-2011. Parasitism rates of up to 60% were observed at release sites during spring and summer compared to < 20% at sites with no releases, showing that augmentative release can potentially increase incidence of parasitism by *T. radiata* in the field, particularly during spring when young shoots and psyllids are abundant and natural parasitism rates low.

10:25 [32]
Novel, Hands-On Educational Methods for Pest Control Professionals. Ellen Thoms. Dow AgroSciences, 7257 NW 4th Bvld, #20, Gainesville, FL 32607. emthoms@dow.com

The presentation will review novel hands-on methods for training pest control personnel, including training facilities for control of wood-destroying pests, Washington State University Structural Pest IPM Facility, University of Florida School of Structural Fumigation, and the University of Georgia Pest Management Certificate Program.

10:40 [33]
Evaluation of Tuber Characteristics on the Larval Infestation Potential of the Andean Potato Weevil (*Premnotrypes Suturicallus*). Alfredo Rios. OARDC/Entomology Department, The Ohio State University, 1680 Madison Avenue, Wooster 44691. rios.43@osu.edu

Intensification of agriculture in the Andes has increased the use of high yielding over native potato varieties. This study evaluates the impact of tuber characteristics including tuber position within the potato hill on the larval colonization potential of the Andean potato weevil (*Premnotrypes suturicallus*). Evaluations were made in a native and a high yielding variety through the use of artificial infestations.

10:55 [34]
Evaluation and Implications of Andean Potato Weevil Infestation Sources for Its Management in the Andean Region. Alfredo A Rios and Jurgen Kroschel. OARDC/ Entomology Department, The Ohio State University, 1680 Madison Avenue, Wooster 44691. rios.43@osu.edu

This study quantified Andean potato weevil (*Premnotrypes suturicallus*) infestation sources in Peruvian crop rotation systems. Infestation sources were mainly potato fields with the highest infestation (89%) followed by olluco (*Ullucus tuberosus*) and oat (*Avena sativa*) fields having volunteer potato plants (35%) and fallow fields (20%). Weevil larval densities per plant showed that fields on 2-year potato rotations had eight times more overwintering weevils than 1-year rotations confirming the importance of potato crop rotations for weevil management.

11:10 [35]
Eradication of an Invasive Termite: *Nasutitermes corniger* (Isoptera: Termitidae: Nasutitermitinae) from Southeastern Florida. Rudolf H. Scheffrahn, Hartwig H. Hochmair, William H. Kern Jr., Jan Krecek, Boudanath Maharajh, John Warner, Brian J. Cabrera, Robert B. Hickman, and Steven E. Dwinell. University of Florida, Fort Lauderdale Research & Education Center, 3205 College Avenue, Davie, Florida 33314. rhsc@ufl.edu

In 2001, a flourishing infestation of the exotic termite, *Nasutitermes corniger*, was discovered in Dania Beach, Florida. This was the first land-based population of a *Nasutitermes* sp. on the U.S. continent. In 2003, a series of surveys and spray applications with fipronil were conducted. Populations declined rapidly early on, but activity lingered until 2009 because small colonies were difficult to find. Three recent survey cycles have failed to yield live termites making this the first known eradication of an established termite population.

11:25 [36]
New Insecticides for Managing *Bemisia tabaci* and Tomato Yellow Leaf Curl Virus on Tomato. Hugh A. Smith and David J. Schuster. University of Florida, Gulf Coast Research and Education Center, 14625 CR 672, Wimauma, FL, 33598. hughasmith@ufl.edu

Information will be presented from greenhouse and field trials on the efficacy of new and standard insecticides for suppressing *Bemisia tabaci* and reducing transmission of tomato yellow leaf curl virus in tomato. New active ingredients include BYIO2960, cyazypyr, and pyrifluquinazon. Greenhouse trials were carried out in screen cages in which tomatoes (var. Florida 47) were exposed to viruliferous whiteflies 3, 7, and 14 days after insecticide treatment. Field trials include comparisons of at-plant neonicotinoid treatments (imidacloprid vs. dinotefuran).

11:40 [37]
Flea Beetles (Coleoptera: Chrysomelidae) in Florida Blueberries: Cultivar Preferences and Management. Craig R. Roubos, Oscar E. Liburd, and Teresia W. Nyoike. University of Florida, Entomology and Nematology Department, Bldg. 970 Natural Area Drive, Gainesville, FL 3261. roubosc@ufl.edu

Flea beetles are the most damaging post-harvest pests of blueberries in the southeastern United States. *Colaspis pseudofavosa* Riley was the most abundant flea beetle species sampled at a north-central Florida blueberry farm. Laboratory feeding assays were conducted using field-collected *C. pseudofavosa*. Results indicate that adults feed preferentially on young foliage. Varietal preference was also observed with adults consuming more southern highbush foliage than rabbiteye foliage.

Tuesday Afternoon, July 26th

SYMPOSIUM: **Chilli Thrips: Current Status and Future Challenges**

Organizer and Moderator: **Dr. Steven Arthurs,** University of Florida, IFAS, Mid-Florida REC

2:05 [38]
Chilli Thrips in Florida, A Perennial or Transient Problem? Steven Arthurs. Dept. Entomology and Nematology, Mid-Florida REC, Apopka, FL 32703

Since its establishment in Florida in 2005, chilli thrips has spread rapidly on ornamental nursery and landscape plantings. To date chemical controls are not always providing a robust solution, especially in outdoor plantings. I discuss the likely role of natural and augmentative biological control to manage this pest.

Chilli thrips en Florida, un problema permanente o transitorio? – Desde su establecimiento en Florida en 2005, el chilli thrips se ha propagado rápidamente en viveros de plantas ornamentales y paisajes plantados. Hasta la fecha los controles químicos no siempre han probado ser una solución amplia, especialmente en plantaciones de exterior. Se discute el papel del control natural y el control biológico aumentativo para el manejo de este insecto plaga.

2:25 [39]
Is Chilli Thrips (*Scirtothrips Dorsalis*) a Significant Pest for the Continental US? Matthew Ciomperlik. USDA APHIS PPQ Center for Plant Health Science and Technology, Mission Laboratory, Edinburg, TX.

Chilli Thrips, *Scirtothrips dorsalis* Hood has been in the U.S. for 6 years, and has caused significant damage in ornamental landscapes, but has not risen to become a prominent agricultural pest. This presentation will review information developed on identification of damage symptoms, potential crop impacts, distribution models, chemical control, DNA sequence analysis of worldwide populations, and preliminary tests of predator species.

Es el Chilli Thrips (*Scirtothrips dorsalis*) un insecto plaga significativo para el continente de los EE.UU.? – El chilli thrips, *Scirtothrips dorsalis* Hood ha estado en los EE.UU. por 6 años y ha causado significativos daños en paisajes ornamentales, pero no se ha incrementado hasta convertirse en una plaga propiamente agrícola. Esta presentación revisará la información desarrollada en la identificación de síntomas de daños, los impactos potenciales en cultivos, modelos de distribución, control químico, análisis de secuencia de ADN de poblaciones a nivel mundial y pruebas preliminar de especies predadoras.

2:45 [40]
Sampling, Distribution and Management of Chilli Thrips, *Scirtothrips dorsalis* Hood (Thysanopter: Thripidae). Dakshina R. Seal. Dept. Entomology and Nematology, Tropical REC, Homestead, FL 33031

Chilli thrips is an economically important pest of vegetable, ornamentals and fruits. To develop a reliable method for sampling chilli thrips is the first step in designing a proper management program. Direct sampling using leaves of host plants is accurate and reliable. This kind of

sampling provides information about distribution of CSF. Chemicals of various classes are effective controlling chilli thrips in a greenhouse situation. Various microbial and natural enemies are also effective against chilli.

Muestreo, distribución y manejo del Chilli Thrips, *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) – El chilli thrips es un insecto plaga de importancia económica en vegetales, ornamentales y frutas. Desarrollar un método confiable de muestreo del chilli thrips, es el primer paso en el diseño un programa de manejo adecuado. El muestreo directo usando hojas de plantas hospederas es exacto y confiable. Esta clase de muestreo brinda información acerca de la distribución de CSF. Insecticidas químicos de varias clases son controladores efectivos del chilli thrips en condiciones de invernaderos. Varios microorganismos y enemigos naturales también son eficaces contra el chilli thrips. .

3:25 [41]
A Novel Technique for Direct Correlation of Traditional Morphological Taxonomy with Molecular DNA Barcoding for Identification of Chilli Thrips Using Scanning Electron Microscopy. C. L. McKenzie, V. Kumar, D. R. Seal, and L. S. Osborne. USDA-ARS, Fort Pierce, FL 32945

Chilli thrips' small size and cryptic nature make monitoring and identification very difficult. We coupled morphological and molecular identification techniques to develop a novel diagnostic method for chilli thrips identification. In the past, thrips specimens had to be slide mounted for morphological identification and were destroyed or rendered unusable for DNA analysis. Our results showed the two techniques together could be used for identification and further molecular analysis of thrips species using a single specimen.

Una nueva técnica para la correlación directa de la taxonomía tradicional morfológica con código de barras de ADN molecular para la identificación del Chilli Thrips mediante microscopia electrónica de barrido – El tamaño pequeño del chilli thrips y su naturaleza críptica hacen el monitoreo y la identificaron difícil. Hemos unido las técnicas de identificaron morfológica y molecular, para desarrollar un nuevo método de diagnostico para la identificación del chilli thrips. En el pasado, los especimenes del chilli thrips fueron montados en placas para su identificaron morfológica y fueron destruidas o no utilizables para el análisis de ADN. Nuestros resultados muestran que las dos técnicas en conjunto podría ser usadas para la identificación y el adicional análisis molecular de thrips usando un solo espécimen.

3:45 [42]
Evaluations of Bioinsecticides to Control Populations of Chilli Thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae). Luis F. Aristizábal, Steven S. Arthurs, and Pasco Avery. Dept. Entomology and Nematology, Mid Florida REC, Apopka, FL 32703

The chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae), a recent exotic pest in Florida and elsewhere, has > known 100 host plants. We tested entomopathogenic fungi *Beauveria bassiana, Metarhizium brunneum (=anisopliae),* and *Isaria fumosorosea* in laboratory and greenhouse trials. Concentrations over 10^7 spore/ml of all fungi killed > 50% of insect under lab conditions while populations were reduced by 87%, 86%, and 62% by *M. brunneum*, *B. bassiana*, and *I. fumosorosea* respectively under greenhouse conditions.

Evaluaciones de bioinsecticidas para el control de poblaciones de Chilli Thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae) – El chilli thrips, *Scirtothrips dorsalis* (Thysanoptera: Thripidae), una reciente plaga exótica en la Florida y en otras áreas, tiene mas de 100 plantas hospederas conocidas. Se evaluaron los hongos entomopatógenos *Beauveria bassiana, Metarhizium brunneum* (= *anisopliae*) e *Isaria fumosorosea* en pruebas de laboratorio y en invernadero. Concentraciones superiores a 10^7 esporas/ ml de todos los hongos controlaron mas del 50% de la población del insecto, mientras que las poblaciones fueron reducidas en 87%, 86% y 62% por *M. brunneum*, *B. bassiana* e *I. fumosorosea* respectivamente bajo condiciones de invernadero.

4:05 [43]
Preventive and Curative Control of Chilli Thrips *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) Using Various Regimes of Biological and Chemical Insecticides. Vivek Kumar, Dakshina R. Seal, Cindy L. McKenzie, David J. Schuster, Lance Osborne, Charles A. Powell and Garima Kakkar. Dept. Entomology and Nematology, Tropical REC, Homestead, FL 33031

Worldwide, chemical control is the primary mode of regulating chilli thrips *Scirtothrips dorsalis* Hood. In order to forestall or delay the development of insecticide resistance in chilli thrips, we continued our focus on the discovery of insecticides with different modes of action for rotational use. In the current study we evaluated candidate insecticides including entomopathogenic fungi and various groups of chemical classes of insecticides to develop efficient, preventive and curative control strategies for regulating *S. dorsalis* populations.

Control preventivo y curativo del Chilli Thrips *Scirtothrips dorsalis* Hood (Thysanoptera: Thripidae) usando varios regimenes de insecticidas biológicos y químicos – A nivel mundial el control químico es el principal modo de regulación del chilli thrips. Con el fin de prevenir o retrazar el desarrollo de resistencia a insecticidas en el chilli thrips, continuamos nuestro enfoque en descubrir insecticidas con diferentes modos de acción para el uso rotacional. En el presente estudio, se evaluaron insecticidas candidatos incluyendo hongos entomopatogénicos y varios grupos químicos de las clases de insecticidas, para desarrollar estrategias de control eficaces, preventivas y curativas en la regulación de las poblaciones del *S. dorsalis.*

4:25 [44]
Ornamental Pepper: A Potential Banker Plant for Establishment of *Amblyseius swirskii* (Acari: Phytoseiidae) to Manage Chilli Thrips. L.S. Osborne, C.L. McKenzie, Y. Xiao, P. B. Avery, and J. Chen. Dept. Entomology and Nematology, Mid Florida REC, Apopka, FL 32703

We will discuss the development of IPM programs for managing chilli thrips, *Scirtothrips dorsalis*, in ornamentals using biological controls and pesticides.

Pimienta Ornamental: Una planta potencial para el establecimiento de *Amblyseius swirskii* (Acari: Phytoseiidae) para el manejo del Chilli Thrips – Vamos a discutir el desarrollo de un programa de manejo integrado del chilli thrips, *Scirtothrips dorsalis,* en platas ornamentales, usando controladores biológicos y plaguicidas**.**

SYMPOSIUM: **Current Research Related To Bed Bugs**

Organizer and Moderator: **Suganth Kannan,** Student, American Heritage School, Plantation, FL

3:30 [45]
Biology of the Cimicidae and Why Bed Bugs Are Pests. William H. Kern Jr. whk@ufl.edu

The Cimicidae (Hemiptera;Heteroptera) contains about 91 species, but only 3 species feed on humans; Common bed bug, *Cimex lectularius* , Tropical bed bug, *Cimex hemipterus*, and the African bed bug, *Leptocimex boueti*. Most species in the Cimicidae are very host specific and parasitize bats or cavity /cave nesting birds; especially swifts, swallows, owls, woodpeckers, parrots, etc. The most commonly encountered Cimicid other than bed bugs is the Eastern Bat Bug, *Cimex adjunctus.*

3:50 [46]
Heat, Volatiles and Monitoring in Bed Bug Management. Roberto M. Pereira. rpereira@ufl.edu, and Philip G. Koehler. pgk@ufl.edu

Detection and control of bed bugs can be challenging and alternative control methods are needed. Among new bed bug management techniques are localized heat treatments, use of volatile insecticides and heat combination, and new detecting techniques using monitors and electronic sensors. Research at UF Urban Entomology Laboratory has provided new effective and affordable techniques for management of bed bug infestations.

4:10 [47]
From Micro to Macro: Spatial Population Genetic Structure in the Bed Bug, *Cimex lectularius.* Warren Booth. wbooth@ncsu.edu

Despite global population resurgence, little is known regarding the genetic associations between aggregations or populations of bed bugs, *Cimex lectularius*, within the United States. Understanding such relationships is essential in the development of effective management strategies, both within and among infestations. Through the development and application of highly polymorphic, and hence informative, DNA markers, we describe genetic structuring at both the microgeographic (within apartment buildings) and macrogeographic (among buildings) scale within the United States.

4:30 [48]
New Chambered Heat Treatment of Bed Bugs. Phil Hadley. phil.hadley@collierpestcontrol.com

Proper procedures for Bed Bug Heat Treatment through Heat Treat, in the room infested, the mattress, box springs, bed frame, head board, upholstered furniture, draperies, drapery rods, and any other furniture Bed Bug infested. Benefits of the chambered heat treatment compared to other heat treatments and traditional chemical treatments.

4:50 [49]
Practical Methods of Bed Bug Treatment. Keith D Ruebling, President, Laure Pest Management. kdr@laurepest.com

5:10 [50]
Green Solution for Bed Bug Eradication. Suganth Kannan. suganthkannan@yahoo.com

Resurgence of the bed bug menace around the United States of America inspired the researcher to discover an eco-friendly way to eradicate the bed bugs without use of harmful chemicals. The researcher conducted experiments to kill bed bugs using fumes of organic vegetable skins of onion, garlic, and red chili. Then the dead ones were counted. The researcher found onion skin fumes were the most effective in eradicating the bed bugs. The result provides a potential breakthrough to eradicate bed bugs through an eco-friendly process.