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Abstracts

Georgia Entomological Society



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Molecular Markers for Identification of the Parasitoids and Hyperparasitoids of Some Homopterous Insects

Shaaban Abd-Rabou

Plant Protection Research Institute, Agricultural Research Center, Dokki, Giza, Egypt
shaaban59@yahoo.com

GA Entomol. Soc. Annual Meeting 2006. 70: 5 (Abstract)

Abstract Molecular markers have been developed to detect the presence of primary parasitoids in some homopterous insects for use in estimating parasitism rates. However, the presence of parasitoids may lead to underestimates of primary parasitism rates. Therefore, molecular markers to detect parasitoids were developed. The 16S ribosomal RNA mitochondrial gene was amplified by polymerase chain reaction (PCR) and sequenced from four parasitoid and hyperparasitoid species, *Ablerus atomon* (Walker), *Encarsia citrina* (Craw), *Eretmocerus parasiphonini* Evans and Abd-Rabou and *Eretmocerus aegypticus* Evans and Abd-Rabou, five geographic isolates of the primary parasitoid, *Aphytis chrysomphali* (Mercet) and six whiteflies and scale insects species: *Aonidiella aurantii* (Maskell), *Chionaspis stantophri* Cooley, *Chrysomphalus aonidum* (L.), *Hemiberlesia latania* (Signort) (scale insects); *Bemisia tabaci* (complex) (Genn.) and *Siphoninus phillyreae* Haliday). Species-specific PCR primers were designed for each insect on the basis of these 16S rRNA gene sequences. Amplification of template DNA, followed by agarose gel electrophoresis, successfully distinguished *A. atomon*, *E. citrine*, *E. parasiphonini* and *E. aegypticus* five geographic isolates of the primary parasitoid from all five isolates of *A. chrysomphali* and all six whiteflies and scale insects species.

Greenhouse and Field Evaluations of WideStrike™ Cotton Trait Efficacy under Variable Infestations of the Corn Earworm, *Helicoverpa zea*, During 2003-2005

J. N. All¹ and L. B. Braxton²

¹Department of Entomology, University of Georgia, Athens GA jall@uga.edu

²Dow AgroSciences, Indianapolis IN

GA Entomol. Soc. Annual Meeting 2006. 70: 5 (Abstract)

Abstract Various cotton varieties possessing the WideStrike™ trait (plant incorporated protectant expressing Cry 1F and Cry 1Ac insecticidal proteins derived from *Bacillus thuringiensis* (*Bt*)) showed good suppression of corn earworm, *Helicoverpa zea* (Boddie), damage to plant terminals and fruiting structures under intense and moderate infestations were in greenhouse and field tests during 2003-2005. In all three years, the WideStrike™ cotton had significantly better control of insect infestations and a trend for higher yield than non*Bt* cotton. Examination of trends in the data during the three years indicates that use of Karate® @ 0.03 lbs ai/acre + Tracer® @ 0.062 lbs ai/acre increased insect control and improved yield in both WideStrike™ and the non*Bt* cotton used as a check in the tests. Insect control by WideStrike™ varieties tolerant to glyphosate were not affected by use of the herbicide on the cotton and was similar to glyphosate tolerant cotton varieties expressing either Bollgard I® (plants producing Cry 1Ac insecticidal protein) or Bollgard II® (plants producing Cry 1Ac and Cry 2Ab insecticidal proteins) traits.

Georgia Entomological Society 2006 Founder Lecture Honoring Dr. Gary Herzog

Max Bass

Retired Interim Resident Director, University of Georgia, Coastal Plain Experiment Station and Interim Associate Director, University of Georgia Experiment Station System mjbeck@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 6 (Abstract)

Abstract Dr. Gary Herzog (1947-2001) was born to the late Carl Herzog and Leona Herzog on February 2nd 1947, in Slaton, Texas, where he grew up on the family farm. Gary received his B.S. degree at Texas Tech and then served two years in the army before entering Graduate School at the University of Arkansas. Working at U Ark at the time was a beautiful young lady named Ann Burdette who later became Mrs. Gary Herzog. Dr. Herzog began his career at the University of Georgia in 1977 as a Research Cotton Entomologist. Gary held 69 national or regional offices during his career, plus served as Chairman of the Cotton Insect Research and Control Conference for 10 years. Gary also served as President of the Southeastern Branch of the ESA and was on the Governing Board of the ESA. While at UGA, Dr. Herzog received approximately 3.1 million dollars in grant funds and selflessly used much of his funding for the good of all at the Experiment Station. For example, a new research farm was purchased for the UGA Tifton Campus in the mid-1990's from Dr. Herzog's grant funds. Gary Herzog loved farming and the study of insects in field environments. His academic achievements were many, although he would consider his greatest achievement to have been providing useful information to the cotton farmer.

Evaluation of *LastCall*TM NPTM for Control of Nantucket Pine Tip Moth in Loblolly Pine Plantations

Jessica Beck, C. Wayne Berisford, and Mark Dalusky

Department of Entomology, University of Georgia, Athens, GA 30602 mjbeck@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 6 (Abstract)

Abstract The Nantucket pine tip moth is a significant pest of pine plantations in the southeast United States. Rising societal concerns demand an increase in environmentally friendly, cost-effective pest control options. *LastCall*TM NPTM is a hydrophobic, UV stable attracticide containing both pheromone and insecticide components. Varied rates of *LastCall*TM were tested in loblolly pine plantations in the Georgia Coastal Plain. Efficacy was determined through tree damage and volume measurements.

Functional Response of Generalist Predators to Common Turfgrass Pests

Kris Braman

Department of Entomology, University of Georgia, Griffin, GA 30223 kbraman@griffin.uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 6 (Abstract)

Abstract The functional response of *Geocoris*, *Harapalus* and *Megacephala* spp. to fall armyworm and Japanese beetle eggs and larvae was examined in the laboratory. The comparative efficiency of each predator will be discussed.

Development and Use of Bt Cotton in the U.S.

L.B. Braxton

Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46268 lbraxton@dow.com

GA Entomol. Soc. Annual Meeting 2006. 70: 7 (Abstract)

Abstract Cotton genetically engineered to express insecticidal toxins of *Bacillus thuringiensis* has been commercially available in the U.S. since 1996. Activities associated with the discovery, development and maintenance of this technology in the marketplace requires significant biology, regulatory and commercial effort. In addition to standard agronomic considerations, the successful management of a *Bt* cotton crop requires attention to pest density, differential susceptibility of pests to specific *Bt* toxins, dynamics of plant toxin expression and management of non-*Bt* susceptible pests.

Effect of Seeding Rate and Gaucho Seed Treatment on Aphid and BYD Incidence and Yield of Winter Wheat

G. D. Buntin¹ and R. D. Lee²

¹Department of Entomology, University of Georgia, Griffin, GA gbuntin@griffin.uga.edu

²Department of Crop & Soil Sciences, University of Georgia, Tifton, GA.

GA Entomol. Soc. Annual Meeting 2006. 70: 7 (Abstract)

Abstract The effect of seeding rate and seed treatment of the systemic insecticide Gaucho 480 (imidacloprid) on aphid abundance, incidence of barley yellow dwarf infection, and yield of winter wheat was studied. Trials were conducted near Tifton, Plains, and Griffin, GA in 2004 and 2005. Aphid numbers per unit area were similar among seeding rates but were greater per plant at lower seeding rates. Likewise, BYD incidence was greater at lower seeding rates. Gaucho ST reduced aphid numbers at 30 days after planting at all locations but only suppressed BYD incidence at Griffin. Yield declined at the lowest seeding rate (10 seeds/ft²) but wheat compensated by producing more tillers per plant at seeding rates of 20 – 40 seeds/ft². Seeding rates of winter wheat can be reduced without affecting yield potential, but reducing seeding rate increases the potential risk of BYD infection. Gaucho insecticide was not effective in suppressing BYD incidence but may be useful in controlling aphids and suppressing BYD at Griffin and areas northward.

The Biology of the Corethrellidae of the Southeastern U.S.: Host Attraction and Host Selection

Jeremy V. Camp and William S. Irby

Department of Biology, Georgia Southern University, Statesboro, GA jcamp12@georgiasouthern.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 7 (Abstract)

Abstract Flies in the genus *Corethrella* were captured using sound traps. The traps broadcast the mating calls of native frogs. All traps were attractive to corethrellids; however, some host calls were far more attractive than others. Additional experiments will analyze the species of blood taken by these flies in nature in relation to host abundance.

The CR12-MPED Fragment from the Cadherin-Like Protein Bt-R₁ Enhances Cry1a Toxicity to Lepidopteran Larvae

Jiang (John) Chen, Gang Hua, Juan Luis Jurat Fuentes, Mark R. Brown, and Michael J. Adang

Department of Entomology, University of Georgia, Athens, GA 30602-2603 adang@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 8 (Abstract)

Abstract Bt-R₁ is a Bt Cry1A-binding protein on *Manduca sexta* larval midgut epithelia. Insect bioassays indicated that, when applied with Cry1A toxins, the *E. coli* expressed CR12-MPED fragment of Bt-R₁ could significantly potentiate toxin-induced lepidopteran larvae mortality. With this peptide, Cry1A toxin in lower dose could also powerfully control lepidopteran pests.

Anti-Insect Defensive Behaviors of Equines after West Nile Virus Infection

Linsey R. Cozzie and William S. Irby

Department of Biology, Georgia Southern University, Statesboro, GA 30460 lcozzie1@georgiasouthern.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 8 (Abstract)

Abstract Behavioral and neurological sequelae are present in equines infected with and recovered from West Nile Virus. We hypothesized that survivor equines would display changes in their defensive behaviors against biting insects. Results suggest that changes in the rate and/or suite of behaviors utilized are displayed by WNV survivor equids.

Morphological and Physiological Responses of Corn Seedlings to Brown and Southern Green Stink Bug Feeding

Kedong Da¹, Xinzhi Ni¹, David Buntin², and Steve Brown³

¹ Crop Genetics and Breeding Research Unit, USDA-ARS, Tifton, GA 31793 kdda@uga.edu

² Department of Entomology, University of Georgia, Griffin, GA 30223

³ Department of Entomology, University of Georgia, Tifton, GA, 31793

GA Entomol. Soc. Annual Meeting 2006. 70: 8 (Abstract)

Abstract Effect of brown, *Euschistus servus* (Say), and southern green stink bug, *Nezara viridula* (L.) (Hemiptera: Pentatomidae), feeding on 2- 3- and 4-leaf stages of corn seedlings was examined under greenhouse conditions. Impact of stink bug feeding was assessed by morphological (i.e., plant height, stem circumference) and physiological parameters (i.e., photosynthetic rate, and light and CO₂ response curves). The impact of stink bug feeding on corn seedlings varied among the growth stages of corn seedlings.

Development and Use of YieldGard Corn in the Corn Belt and the South

Todd DeGooyer

Technology Development, Monsanto Company, St. Louis, MO 63167 todd.a.degooyer@monsanto.com

GA Entomol. Soc. Annual Meeting 2006. 70: 9 (Abstract)

Abstract YieldGard® Corn was the first full-season *Bacillus thuringiensis* or Bt based plant insect protection technology to be commercialized in the United States. YieldGard Corn, or YieldGard Corn Borer as it is known as today, provides broad spectrum lepidopteran control of European, southwestern and sugarcane borers as well as suppression of corn earworm, fall armyworm and stalk borer. Today, the YieldGard Insect-Protected Corn family has grown to include YieldGard Corn Borer, YieldGard Rootworm and YieldGard Plus. An overview of the current YieldGard Family including market penetration and performance in the Corn Belt and the South will be discussed. In addition, future corn insect technologies that will be available to corn growers in the next five years also will be highlighted.

Bugwood Network 2006

G. Keith Douce, David J. Moorhead, Charles T. Barger and Christopher W. Evans

University of Georgia, Bugwood Network, Tifton, GA 31793 kdouce@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 9 (Abstract)

Abstract The University of Georgia's Bugwood Network maintains 15 websites, with topics ranging from entomology and IPM to invasive species and forest health. These sites average over 7 million hits per month. This talk will focus on new and future directions and technologies used to enhance and deliver information.

Insect Images: Developing a Comprehensive Collection of Entomology Images

G. Keith Douce, David J. Moorhead, Charles T. Barger and Christopher W. Evans

University of Georgia, Bugwood Network, Tifton, GA 31793 kdouce@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 9 (Abstract)

Abstract Insect Images, www.insectimages.org, contains over 13,000 images of 2300 species taken by over 500 photographers. These images are available for use in all educational applications. The authors are currently pursuing images in order to provide examples of each of the major insect families in North America.

Parasitic Arthropods of Sympatric Woodrats and Cotton Mice with Emphasis on Ectoparasites of Medical/Veterinary Importance

Lance A. Durden, Craig W. Banks and Andrew N. Quesada

Department of Biology and Institute of Arthropodology & Parasitology, Georgia Southern University, Statesboro, GA 30460 ldurden@georgiasouthern.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 10 (Abstract)

Abstract Parasitic arthropods were collected from cotton mice and eastern woodrats at Broxton Rocks Preserve, Georgia. Twelve species of arthropods were collected from cotton mice and 14 from woodrats; 5 species occurred on both hosts. Seven species of ectoparasites of medical/veterinary importance were collected: 2 fleas, 2 ticks, 1 mesostigmatid mite and 2 chiggers.

Release of Predatory Mites for Control of Pecan Leaf Scorch Mite

Jim Dutcher

Department of Entomology, University of Georgia, Tifton, GA 31793 dutch88@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 10 (Abstract)

Abstract Western predatory mite release in the center tree of a one acre block of pecan trees lead to control of pecan leaf scorch mite in four weeks over the entire one acre plot. Acramite was found to kill pecan leaf scorch mite and conserve phytoseiid mites. In the following season, western predatory mite was established in the orchard and Acramite controlled scorch mites for six weeks whereas standard materials only controlled mites for two weeks. High levels of rainfall during the trial tends to indicate that the increased residual control in the Acramite treatment was due to the presence of more phytoseiid mites in the Acramite treated trees.

Management of Coastal Forests and Forest Insect Pests

Dr. Rebecca S. Effler

UGA Marine Institute, Island Forest Research Lab, Sapelo Island, GA 31327, reffler@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 10 (Abstract)

Abstract Coastal forests are impacted through development, hydrological modification, and global sea level rise; and these changes continue to rise. Interactions of coastal management and forest insect pests will be discussed in a Louisiana baldcypress-water tupelo swamp (Maurepas) and a Georgia barrier island maritime forest (Sapelo Island).

Effects of Parasitism on Honey Bee Pollination Efficacy and Foraging Energetics

Amanda M. Ellis and Keith S. Delaplane

Department of Entomology, University of Georgia, Athens, GA 30602 amorgan@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 11 (Abstract)

Abstract We investigated the sub-lethal effects of parasitic varroa mites and small hive beetles on the pollination efficacy and foraging energetics of honey bees. Plants pollinated by parasitized bee colonies had higher fruit-set. Varroa-parasitized bees realized a significantly lower rate of net energy gain while foraging.

An Evaluation of Fruit-Boost™ in Enhancing Honey Bee Pollination of Seedless Watermelons

Amanda M. Ellis and Keith S. Delaplane

Department of Entomology, University of Georgia, Athens, GA 30602 amorgan@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 11 (Abstract)

Abstract We determined if the application of Fruit Boost™, a honey bee attractant, to seedless watermelon during bloom promotes pollination by honey bees. Fruit Boost™ did not significantly increase the proportion of honey bee visits. There was a non-significant increase in percent fruit-set in Fruit Boost plots compared to controls.

How Small Hive Beetle (*Aethina tumida*) Density Affects Beetle Oviposition in Bee Brood and Subsequent Removal of Brood by European Honey Bees (*Apis mellifera*)

James D. Ellis and Keith S. Delaplane

Department of Entomology, University of Georgia, Athens, GA, 30602 jdellis@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 11 (Abstract)

Abstract Honey bees can detect abnormal/parasitized brood, remove the wax covering it, and remove the infected pupa (hygienic behavior). However, *Aethina tumida* can oviposit on brood in a disguised manner. Despite this ruse, we discovered that honey bees can detect and remove all brood on which *Aethina tumida* have oviposited.

The Importance of Confinement Behavior in Limiting the Number of Would-Be Symbionts in Honey Bee Colonies

James D. Ellis and Keith S. Delaplane

Department of Entomology, University of Georgia, Athens, GA, 30602 jdellis@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 11 (Abstract)

Abstract Honey bees host a limited number of symbionts when compared to ants and termites. A number of hypotheses have been suggested to explain this phenomenon but none are satisfactory. Here, we suggest that confinement behavior plays an integral role in limiting the number of would-be symbionts in honey bee colonies.

Collaborating with Libraries to Educate the Public about IPM

L.P. Guillebeau and G.V. Pettis

Department of Entomology, University of Georgia Athens, GA 30602 bugman@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 12 (Abstract)

Abstract Integrated pest management (IPM) is widely accepted as the best way to manage pest populations and minimize pesticide risks. However, the general public is not well informed about IPM strategies or implementation. Better public education about IPM could reduce pesticide risks around the home, and greater public support could result in increased funding for IPM research and outreach. With a grant from USDA, we developed a collaborative project with Georgia public libraries to educate the public about IPM, using displays, bulletins, and promotional items. This report will present the results from the pilot that included about 25 libraries.

Cultural Controls for House Flies in Caged Layer Houses

Nancy C. Hinkle¹, Bruce Webster², Sid Thompson³, and Bill Merka²

¹Department of Entomology, University of Georgia Athens, GA 30602 nhinkle@uga.edu

²Department of Poultry Science, University of Georgia Athens, GA 30602

³Department of Biological and Agricultural Engineering, University of Georgia Athens, GA 30602

GA Entomol. Soc. Annual Meeting 2006. 70: 12 (Abstract)

Abstract House fly larvae thrive in chicken manure. To investigate the process of rapidly composting manure as a fly management strategy, a procedure was developed for incorporating extraneous carbon sources and stimulating biogenic heat production through *in-situ* manure composting. While in-house composting provides many benefits in reducing manure volume and enhancing soil amendment value, it appears to have limited value in suppressing house fly development.

Ectoparasites of Road-Killed Mammals in Southeastern Georgia

Marquita T. Holmes, Alena E. Aviles and Lance A. Durden

Department of Biology and Institute of Arthropodology & Parasitology, Georgia Southern University, Statesboro, GA 30460 ldurden@georgiasouthern.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 12 (Abstract)

Abstract Ectoparasites were collected from fresh road-killed mammals in Bulloch, Bryan and Screven counties, Georgia. 33 different species of mammals were sampled and 86 ectoparasite species were recorded. Most ectoparasites were alive and undamaged. Some of the ectoparasites recorded also feed on humans or domestic animals and some are vectors of zoonotic pathogens.

Investigating the Impact of Chinese Privet Invasion on Insect Communities

Scott Horn and James L. Hanula

USDA Forest Service, 320 Green Street, Athens, GA 30602 shorn01@fs.fed.us

GA Entomol. Soc. Annual Meeting 2006. 70: 13 (Abstract)

Abstract Chinese privet, *Ligustrum sinense*, is estimated to occupy 3.5% of forestlands in the Southeast and as much as 59% of the Oconee River floodplain in Northeast Georgia. Chinese privet is considered one of the most disruptive exotic plants in Georgia, therefore we are beginning to investigate how its invasion might affect insect communities. Pitfall, pan, and canopy traps will be used to determine if privet invasion has an impact on target groups such as ground beetles and pollinators.

Evaluation of Mating Disruption as a Tool for Managing Lesser Peachtree Borer in Middle Georgia Peaches

Dan Horton¹ and Ted E. Cottrell²

¹ Department of Entomology, University of Georgia, Athens, GA dlhorton@uga.edu

² USDA-ARS, SE Fruit & Tree Nut Research Laboratory, Byron, GA

GA Entomol. Soc. Annual Meeting 2006. 70: 13 (Abstract)

Abstract Lesser peachtree borer (*Synanthedon pictipes*), which has long been a minor pest of declining older peaches, has become a primary tree-killing pest of southeastern peaches. Unfortunately, LPTB's pest status has been greatly elevated, apparently catalyzed by regulatory changes that eliminated encapsulated methyl parathion use, forcing growers to adopt a phosmet cover spray regime. Current control measures are inadequate. Pheromone mating disruption of LPTB and PTB has shown promise in middle GA trials, especially if begun early in orchard life. Unanswered questions regarding probable increases in orchard productivity and longevity are stalling implementation of this costly technology.

Flea Beetle Dispersal and Taxonomic Insights from DNA Sequence of *Altica* spp. Host-Specific Collections

T. M. Jenkins¹, S. K. Braman¹, and G. V. Pettis²

¹Dept. of Entomology, The University of Georgia, Griffin, GA 30223, jenkinst@uga.edu

²Dept. of Entomology, The University of Georgia, Athens, GA 30206

GA Entomol. Soc. Annual Meeting 2006. 70: 13 (Abstract)

Abstract We report a phylogenetic study using maternal DNA sequence from adult flea beetles, which were collected from herbaceous host plants in the *Onagraceae* and *Lythraceae* families. It revealed beetle-host plant specificity, a relationship between phenotypic and DNA character states and unrestricted gene flow with possible positive assortative mating.

Predatory Potential and Performance of Heteropteran Predators on Fall Armyworm-Resistant and Susceptible Turf

Shimat V. Joseph and S. Kristine Braman

Department of Entomology, University of Georgia, Griffin, GA 30223 shimat@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 14 (Abstract)

Abstract Laboratory and field experiments indicated effective predation of *O. insidiosus* on fall armyworms (*Spodoptera frugiperda*) feeding on resistant ‘Cavalier’ (zoysiagrass) followed by ‘Palisades’ (zoysiagrass), ‘TifSport’ (bermudagrass) and ‘Sea Isle-1’ (paspalum). *Geocoris punctipes* and *G. uliginosus*, however, were more efficient preying on fall armyworm larvae when feeding on ‘Sea Isle-1’ paspalum.

Monitoring Thrips Vectors in Flue-Cured Tobacco Using Yellow Sticky Traps

Robert M. McPherson and Stanley K. Diffie

University of Georgia, Department of Entomology, Tifton, GA 31793 pherson@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 14 (Abstract)

Abstract Thrips, primarily *Frankliniella fusca*, are a serious threat to Georgia’s tobacco crop. *F. fusca* is a confirmed vector of tomato spotted wilt (TSW), a disease that causes as much as \$17 million in losses in certain years. Thrips are tiny insects that are difficult to observe on the plant foliage or blooms. Yellow sticky traps can be used to effectively monitor the presence of thrips in the farmscape. Captures can be used to estimate the relative abundance of *F. fusca* on tobacco foliage and potential TSW infection. Most thrips movement occurs between 0900 and 1600 h, and more are observed arriving from an eastward direction, based on sticky trap captures.

Advances Screening of Soybean Breeding Lines and Varieties for Stink Bug Resistance

Robert M. McPherson, Phillip Roberts, and Glenn Buss

University of Georgia, Department of Entomology, Tifton, GA 31793 pherson@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 14 (Abstract)

Abstract Stink bugs, primarily *Nezara viridula*, *Euschistus servus*, and *Acrosternum hilare*, are the number one pest of Georgia’s soybean crop, causing \$2-10 million in losses annually. These pests are elusive and often go undetected until population densities exceed economic threshold levels. Insecticidal controls are not very effective and are costly. Developing soybean breeding lines and varieties with resistance to stink bug feeding would provide a practical, effective and environmentally sound management option for Georgia producers. This project has identified several lines with stink bug resistance.

Community of Arthropods in the Webs of the Social Spider *Anelosimus studiosus*

Sarah Mock and Alan Harvey

Department of Biology, Georgia Southern University, Statesboro, GA 30460 entogirl@gmail.com

GA Entomol. Soc. Annual Meeting 2006. 70: 15 (Abstract)

Abstract While investigating the unusual social spider *Anelosimus*, we noticed other arthropod species, apparently not prey, found in the webs of this species. We counted and identified all arthropods in adjacent tree branches with and without *Anelosimus* webs. Found almost no overlap in arthropods of webbed and non-webbed branches, suggesting that *Anelosimus* webs represent a resource or habitat that supports a distinct community of arthropods. This community is surprisingly diverse, with representatives from seven orders recorded to date.

Spatial and Temporal Patterns of Maize Weevil Pre-Harvest Infestation in Corn Fields

Xinzhi Ni¹, Kedong Da¹, Steve Brown², Matthew Krakowsky¹, Dewey Lee³, Anton Coy³, and David Buntin⁴

¹ Crop Genetics and Breeding Research Unit, USDA-ARS, Tifton, GA 31793 xni@tifton.usda.gov

² Department of Entomology, University of Georgia, Tifton, GA, 31793

³ Department of Plant and Soil Sciences, University of Georgia, Tifton, GA 31793

⁴ Department of Entomology, University of Georgia, Griffin, GA 30223

GA Entomol. Soc. Annual Meeting 2006. 70: 15 (Abstract)

Abstract Three corn fields were sampled continuously for 6- or 8-wks to determine the invasion patterns of the maize weevil, *Sitophilus zeamais* Motschulsky (Coleoptera: Curculionidae), infestation. The weekly samplings started when the kernel moisture level was about 30%. The weevil infestation levels varied significantly among the three fields. The key spatial pattern was shown by the edge effect of the fields on weevil distribution, while the key temporal pattern was demonstrated by the gradual dispersal of the weevils throughout the 6- or 8-wk sampling period. The ramifications of the findings for other research and farm practice were also discussed.

Effects of Fire on the Ectoparasites of Small Mammals in Longleaf Pine (*Pinus palustris*) Habitats

Todd N. Nims¹, Lance A. Durden², C. Ray Chandler², and Oscar J. Pung²

¹ Georgia DNR Wildlife Resources Division, Social Circle GA 30025 todd.nims@dnr.state.ga.us

² Biology Department, Georgia Southern University, Statesboro, GA 30461

GA Entomol. Soc. Annual Meeting 2006. 70: 15 (Abstract)

Abstract We hypothesized that fire significantly decreases prevalence and abundance of ectoparasites. We collected 190 mammals in Georgia and recovered 32 ectoparasite species during 2002–03. The overall chance for any mammal of having an ectoparasite was significantly greater on unburned sites. We provide some evidence that fire can affect ectoparasite abundance.

Ticks of the Black Bear, with Recent Data for the Florida Subspecies

Todd N. Nims¹ and Lance A. Durden²

¹Georgia DNR Wildlife Resources Division, Social Circle GA 30025 todd.nims@dnr.state.ga.us

²Biology Department, Georgia Southern University, Statesboro, GA 30461

GA Entomol. Soc. Annual Meeting 2006. 70: 16 (Abstract)

Abstract Seven species of ixodid ticks have been previously recovered from American black bears. Four of these have been collected from the Florida black bear in central Florida. From 2004 to 2005, we collected ticks from 18 bears in 8 northwest Florida counties. We recovered the same four plus *Ixodes affinis*, a new host association.

ACCESS-CURCULIONOIDEA: A Weevil Database for Biosecurity and IPM Decision Making

Tobin Northfield, R. F. Mizell III, Stephanie Bloem, and Margaret Rotstein

University of Florida-IFAS, NFREC-Quincy, 155 Research RD, Quincy, FL northftd@ufl.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 16 (Abstract)

Abstract A database is being developed in Microsoft Access to archive biological information on weevils (Coleoptera: Curculionoidea). This queriable database is unique in the world and our aim is to incorporate into the database the world-wide literature on Curculionoidea. The database will serve as a one-stop information and analytical resource on weevils that will rapidly provide knowledge, generate testable hypothesis and provide answers to most biosecurity-related questions including detection, biogeography, biology, ecology, behavior and management.

Status of Pyrethroid Resistance in Tobacco Budworm and Bollworm Populations in Georgia and Throughout the South

Gregory Payne¹, Philip Roberts², and John Ruberson²

¹University of West Georgia, Carrollton, Georgia 30118 gpayne@westga.edu

²University of Georgia, Tifton, Georgia 31793

GA Entomol. Soc. Annual Meeting 2006. 70: 16 (Abstract)

Abstract The tobacco budworm (*Heliothis virescens*) and the bollworm (*Helicoverpa zea*) are two of the more economically important pests of cotton in the United States. Because the tobacco budworm and bollworm have developed resistance to many of the insecticides used for their control, it is critical that research efforts and agricultural practices be devoted to the preservation of those insecticides that are still effective and to the development of new replacement compounds and technologies. Although pyrethroid insecticides remain effective in the control of bollworm larvae throughout the southeast, adult vial tests indicated an increased survival in populations collected from cotton, sweet corn and a variety of other host crops. Low percentages of resistant individuals may exist within these populations and efforts to monitor pyrethroid resistance in these populations must be continued. An overview of the current status of pyrethroid resistance in the heliothine complex will be presented and discussed.

Integrated Pest Management, Pesticides and Insects: Georgia Resident's Perspectives

Gretchen V. Pettis and L. Paul Guillebeau

University of Georgia, Department of Entomology, Athens, GA 30602 gmark@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 17 (Abstract)

Abstract Georgia residents were polled in Spring 2005 about their perceptions of and familiarity with pesticides, Integrated Pest Management (IPM) and insects in general. Respondents were also asked to identify their primary sources of information on these topics and their insecticide use patterns. Results from this survey can help researchers and extension professionals better target their programs.

Why is a Vegetable Entomologist Worried about Pine Trees?

David G. Riley

Department of Entomology, Coastal Plain Experiment Station, Tifton, Georgia, 31793 dgr@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 17 (Abstract)

Abstract Recent observations on thrips behavior suggest that pine tree pollen deposited on the foliage of vegetables could have a significant impact on thrips settling and oviposition. The shedding of tree pollen occurs each year in the spring as vegetables are being transplanted which could influence both thrips reproduction and vector behavior.

A Summary of Early Season Thrips Control Trials in Georgia Cotton

Phillip Roberts, John Ruberson, Russ Ottens, and David Griffin

Department of Entomology, University of Georgia, Tifton, Georgia, 31793 proberts@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 17 (Abstract)

Abstract Thrips are predictable insect pests of seedling cotton in Georgia and preventive at-plant insecticides are recommended for their control. Thrips injury results in leaf damage, stunting of plants, delays in maturity, and reduced yield potential. Twenty-seven thrips insecticide trials conducted from 2000-2005 were summarized. Yields were numerically increased in 89 percent of recommended treatments compared with the untreated. Thrips numbers per plant at two, three, and four weeks after planting were regressed against cotton yield. Although much variability existed, results suggest that cotton tolerance to thrips infestations increases as seedlings develop.

The History of Entomology in Georgia

Marianne Robinette and Ray Noblet

Department of Entomology, University of Georgia, Athens, GA 30602 entomolo@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 18 (Abstract)

Abstract The History of Entomology in Georgia can be traced back to the late 1800's. Federal and state legislation was the guiding and driving force providing funding for excellent entomological research and extension programs. These programs addressed economic and societally driven work with insects in the Georgia Experiment Station and in institutions of higher education in the state. Entomology in Georgia continues to be an important component of College of Agricultural and Environmental Sciences and University programs.

A Preliminary Study of House Fly Dispersal in Rural Georgia

Aubree Roche and Nancy Hinkle

Department of Entomology, University of Georgia, Athens, GA 30602 aroche@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 18 (Abstract)

Abstract *Musca domestica*, the house fly, is a common nuisance associated with animal husbandry. As common as house flies are, little is known about their dispersal habits. This first year studying house fly dispersal became an assessment of techniques used and a learning experience for the future of the study.

Sublethal Effects of Insecticides on the Parasitoid *Trichogramma pretiosum*

John R. Ruberson¹, Melissa D. Thompson¹, Mark R. Abney², and Phillip M. Roberts¹

¹University of Georgia, Department of Entomology, Tifton, Georgia, 31793 ruberson@tifton.uga.edu

²Department of Entomology, North Carolina State University, Raleigh NC

GA Entomol. Soc. Annual Meeting 2006. 70: 18 (Abstract)

Abstract We studied the effect of four insecticides (diflubenzuron, indoxacarb, l-cyhalothrin, and spinosad; at 2 rates each) on the female parasitoid foraging behavior and life histories of parasitoids emerged from treated eggs. Spinosad and l-cyhalothrin affected female host feeding and cleaning behavior, but no other insecticide affected behavior. Parasitoid emergence was affected by treatments, as were some life history traits. However, no clear pattern of effect emerged, as results were inconsistent across dosages among treatment.

Risk Adverse Evaluation of Insect Vulnerability in Value Added Traits in Elite Soybean Germplasm

Michelle Samuel-Foo¹, John N. All¹, H. Roger Boerma², and David Walker²

¹Department of Entomology, University of Georgia, Athens, GA 30602 michfoo@uga.edu

²Department of Crop & Soil Sciences, University of Georgia, Athens, GA 30602

GA Entomol. Soc. Annual Meeting 2006. 70: 19 (Abstract)

Abstract Risk adverse pest management (RAPM) is an integrated pest management philosophy in which growers choose the cultural practice that allows them to have the lowest pest problems without sacrificing agronomic benefit. This study evaluated Value Added Traits (VATs) eg high protein, low linolenic acid in the elite soybean cultivar *Benning* and also examined the effectiveness of including insect resistant genes as a method to reduce pest vulnerability of the VATs. Initial results showed that pest vulnerability of VATs was reduced when incorporated with selected insect resistant genes.

Systematics of the Endomychidae: The Influence of Natural History and on the Evolution of a Mycophagous Beetle Family

F.W. Shockley

Department of Entomology, University of Georgia, Athens, GA 30602 fschockley@bugs.ent.uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 19 (Abstract)

Abstract Despite their ecological importance and their sister-group association with the economically important Coccinellidae, very little work has been done on the systematics of the Endomychidae. Adult and larval morphology were used to reconstruct a phylogenetic hypothesis for the evolution of the family allowing resolution of the intra-familial relationships between taxa and investigation of their co-evolution with their host fungi and their obligate, yeast gut endosymbionts.

The Handsome Fungus Beetles (Coleoptera: Endomychidae) of Great Smoky Mountains National Park: A Contribution to the GSMNP Beetle ATBI

F.W. Shockley

Department of Entomology, University of Georgia, Athens, GA 30602 fschockley@bugs.ent.uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 19 (Abstract)

Abstract Of the 46 species of Handsome Fungus Beetles (Coleoptera: Endomychidae) known to occur in the United States, 31 are located in the eastern U.S. Collection records from adjacent areas suggest that many of those species should be present in Great Smoky Mountains National Park. To date, only 8 species have been collected from within GSMNP. The species currently recorded from GSMNP are summarized and their ranges displayed, and a key to the endomychids of GSMNP is provided.

Taking Entomology on the Road

Linda A Smyth

Chairman, Middle GA Clean Cities Coalition, Retired Associate Professor, Macon, GA
DrLindaSmyth@cox.net

GA Entomol. Soc. Annual Meeting 2006. 70: 20 (Abstract)

Abstract A description of innovative ideas for promoting entomology in an unconventional manner and in non-traditional surroundings: at Georgia's race tracks. "The Killer Bee" is a 944 Porsche that made its debut at the Roebing Road Race Track and the Road Atlanta Course in Georgia in 2005. Some of the insect themes decorating the vehicle are patterned after the Dodge Mopar "Speedy Bee" designs. The car attracts spectators and race car drivers, who immediately begin sharing their own insect stories and ask advice about their pest problems.

Preference and behavior of water lily aphids (*Rhopalosiphum nymphaeae*) on native and invasive species of *Lemnaceae*

M. Cameron Storey and Alan Harvey

Georgia Southern University, Biology Department Statesboro, Georgia 30460
mstorey2@georgiasouthern.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 20 (Abstract)

Abstract Based on the Hopkins' host selection principle organisms should prefer the species upon which they were reared and are familiar with. *Rhopalosiphum nymphaeae* are polyphagous insects that are found throughout southeastern Georgia. We hypothesize that *R. nymphaeae* will prefer the native *Lemnaceae* over the invasive and will also demonstrate a preference for the species upon which they were reared.

Development of an Action Threshold for *Spodoptera exigua* in Tomatoes

James E. Taylor and David G. Riley

University of Georgia, Department of Entomology, Rainwater Rd., Tifton, GA 31793
shinet@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 20 (Abstract)

Abstract Action thresholds were evaluated for beet armyworm, *Spodoptera exigua* (Hübner) in tomato. Beet armyworm is a major fruit feeder in the southeastern tomato growing regions. Insecticide efficacy data was used to estimate new thresholds to compare to current standards. In a separate test, artificial infestations were used to evaluate numbers of beet armyworm larvae to yield loss.

Density and Dispersal of Stink Bugs in Farmscapes in Georgia

Glynn Tillman

USDA, ARS, Crop Protection and Management Laboratory, Tifton, GA 31793
pgt@tifton.usda.gov

GA Entomol. Soc. Annual Meeting 2006. 70: 21 (Abstract)

Abstract The southern green stink bug, *Nezara viridula* (L.), and the brown stink bug, *Euschistus servus*, are the dominant stink species in farmscapes in Georgia. Both corn and peanuts can be sources of these stink bugs for cotton in corn-cotton and peanut-cotton farmscapes. Populations of these pest insects tend to be higher along the interface, or common boundary, of two crops and along field edges.

Management of *Bemisia tabaci* Strain 'Q' in Georgia Greenhouses

Monica Townsend and Ronald Oetting

University of Georgia, Department of Entomology, Griffin, GA 30223
mtownse@griffin.uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 21 (Abstract)

Abstract *Bemisia tabaci* strain 'Q' is a new introduction into the United States and Georgia greenhouse production. Whitefly 'Q' strain has been reported to have increased resistance to conventional chemical controls, and has now been reported in 21 states. The need to develop management strategies for a pest is important for greenhouse production and the reduction of resistance to standard chemicals. It also is a threat to field production of agricultural crops. New chemistries and standard controls were tested during initial trials in the fall of 2006 in GA. Greenhouses. *Beaveria bassiana* (Naturalis & Botanigard), dinotefuran (Safari), flonicamid (Aria), spiromesefin (Judo), acetamiprid (Tristar) and BYI8330 reduced 'Q' whitefly populations over the trial period. Whitefly populations showed chemical resistance to the neonicotinoids compounds (Marathon and Flagship) in the trials.

The Response of Ground Beetles to Group Selection Harvesting in a Southeastern Bottomland Hardwood Forest

Mike Ulyshen¹, Jim Hanula¹, Scott Horn¹, John Kilgo², and Chris Moorman³

¹USDA Forest Service, Southern Research Station, Athens, GA
mulyshen@hotmail.com

²USDA Forest Service, Southern Research Station, Savannah River Site, New Ellenton, SC

³NC State University, Raleigh, NC

GA Entomol. Soc. Annual Meeting 2006. 70: 21 (Abstract)

Abstract We compared the response of ground beetles (Coleoptera: Carabidae) to the creation of canopy gaps (selection harvests) of different size (0.13 ha, 0.26 ha, and 0.50 ha) and age (1 and 7 yrs) in a bottomland hardwood forest (South Carolina, USA). Carabids were generally more abundant and species rich in the younger gaps than in older gaps of the forest. Species composition differed considerably among sites and many species exhibited strong habitat preferences. Because it mimics natural rates of disturbance and appears to support diverse species assemblages, group selection harvesting may be preferable to other more disruptive timber removal practices.

Seed Yield and Insect Resistance of Near-Isogenic Soybean Lines with Major and Minor Insect QTLs

Caleb Warrington¹, John All¹, Shuquan J. Zhu², and H. Roger Boerma²

¹University of Georgia, Department of Entomology, Athens, GA 30602 cvw4@uga.edu

²University of Georgia, Department of Crop & Soil Sciences, 203 Center for Applied Genetic Technologies, Athens, GA 30602

GA Entomol. Soc. Annual Meeting 2006. 70: 22 (Abstract)

Abstract The development of superior soybean cultivars exhibiting resistance to insects has been hindered greatly due in part to the quantitative nature by which this trait is inherited and also to linkage drag, a phenomenon which has routinely inhibited efforts by breeders and entomologists to create an insect-resistant soybean with acceptable yields. Soybean insect resistance QTLs have mapped to loci on linkage groups (LGs) M, G, H, and D1b. The objectives of this study were to evaluate linkage drag at individual resistance QTL by quantifying seed yield for Benning-derived near-isogenic lines (NILs), to assess the level of PI 229358 genome in Benning NILs linked to individual QTL using SSR markers, to evaluate the individual effects of SIR QTLs M, G, and H as loci conditioning resistance to defoliating insects.

Estimating the Potential Fecundity of *Rhyacionia Frustrana* (Comstock 1880) (Lepidoptera: Tortricidae)

James D. Young and C.W. Berisford

University of Georgia, Department of Entomology, 413 Biological Sciences, Athens, GA 30602
jdyoung@uga.edu

GA Entomol. Soc. Annual Meeting 2006. 70: 22 (Abstract)

Abstract *Rhyacionia frustrana* can be a serious pest of Georgia's pine industry. The fecundity of this pest has been difficult to quantify due to behavioral modifications in captivity so ovaries were dissected to quantify the number of oöcytes present. On average *R. frustrana* had 38 mature and 82 immature oöcytes.

Current and Future Prospects for Soybean Resistant to Defoliating Insects

Shuquan J. (Joe) Zhu¹, John N. All², H. Roger Boerma¹, Wayne A. Parrott¹, and David R. Walker¹

¹Department of Crop & Soil Sciences, University of Georgia, Athens, GA 30602 szhu@uga.edu

²Department of Entomology, University of Georgia, Athens, GA 30602

GA Entomol. Soc. Annual Meeting 2006. 70: 22 (Abstract)

Abstract Bt soybean has been under evaluation for several years, and it is clear that it is possible to obtain field resistance to the major defoliating pests of soybean. Nevertheless, Bt soybean is likely to be grown alongside Bt corn and cotton, raising issues on effective resistance management strategies.

Towards that end, we have been pyramiding Bt with several soybean genes (quantitative trait loci; QTL) for insect resistance. The QTLs were originally found in soybean plant introduction

PI 229358 from Japan, but its use in breeding programs has been historically problematic due to the quantitative nature of its resistance. As a result, varieties derived from it either lacked the full resistance complement of the PI, or also brought undesirable agronomic characteristics along with the insect resistance. The major resistance QTL from PI 229358 is located on Molecular Linkage Group M of soybean, and therefore known as QTL-M.

We have used molecular markers to determine the location of QTL-M, which has in turn made it possible to develop germplasm that is resistant to insects while at the same time not suffering from yield loss. Furthermore, we have developed near-isogenic lines of QTL-M with and without Bt, and with or without other QTLs for insect resistance, thus making it possible to dissect out the interactions between the various QTLs and Bt.

QTL-M has several interesting characteristics:

- It conditions both antibiosis and antixenosis
- It has a synergistic effect with Bt
- It is effective against a Bt-resistant strain of tobacco budworm
- The other QTLs for insect resistance in soybean—one for antibiosis and one for antixenosis, are most effective in the presence of QTL-M

Therefore, we have started an effort to clone QTL-M, as a way to help determine its mode of action, and perhaps make it available for use in other crops.

Soybean has an additional source of resistance to defoliating insects that has not been fully exploited yet. Most accession of the wild progenitor of soybean, *Glycine soja*, have sharp-tipped pubescence, which in turn works as antibiotic resistance against some defoliators, and as antixenotic resistance against the species tested thus far. We will be examining the resistance obtained by combining sharp pubescence tip with QTL-M, with and without Bt.

In the end, it should be possible to obtain soybean with high levels of resistance to defoliating insects, using just genes of soybean origin. Depending on the intended use of the resistant varieties, Bt genes may or may not be part of the final insect resistance package for soybean.