Entomological Society of America

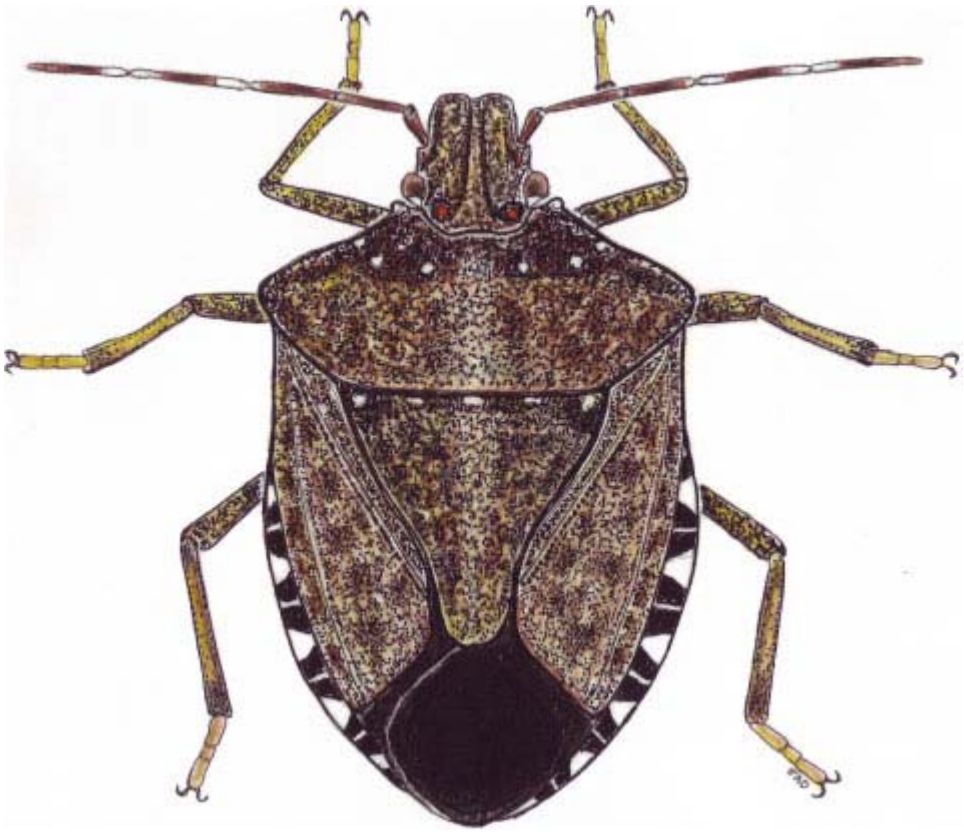
Eastern Branch

82nd Annual Meeting

March 18-21, 2011

Hilton Hotel

Harrisburg, PA



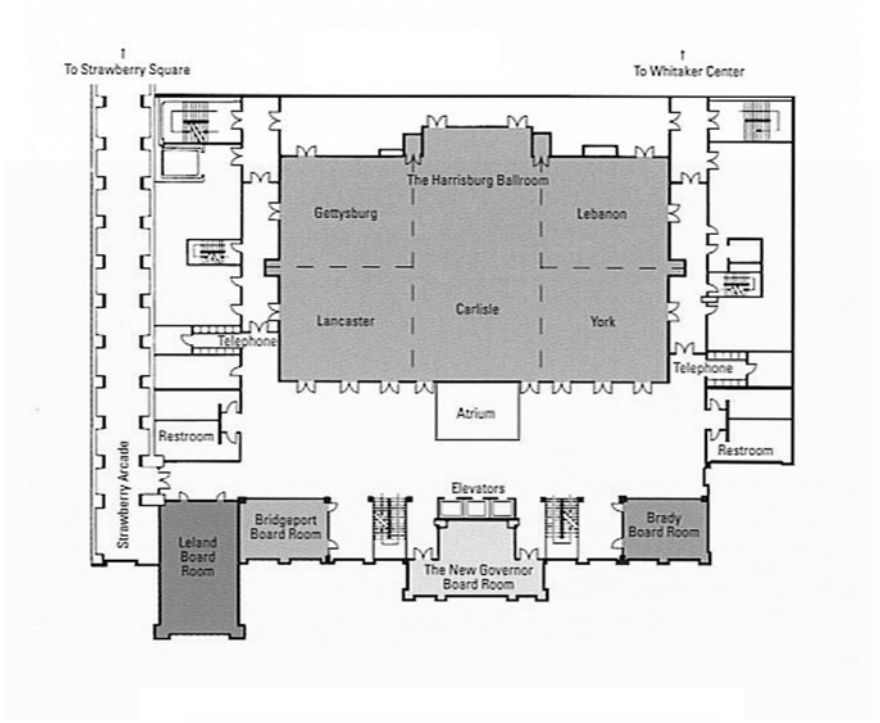
Survival of the Fittest: Insuring the Future of Entomology

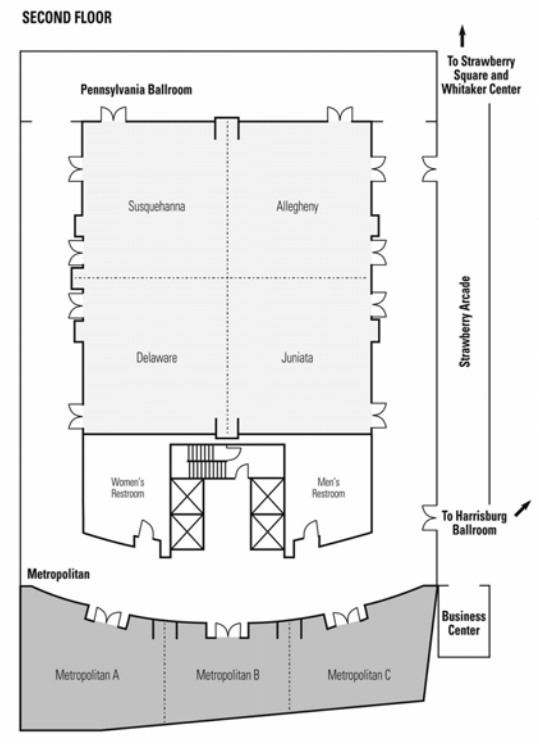
Prep. 8-March-2011

The Program Encapsulated – 2011

	Friday, March 18		
Evening	President's Informal Reception	6:00-8:00	Carlisle
	Saturday, March 19		
Morning	Registration	8:00-12:00	Lobby
	The Plague of the Stink Bug	8:00-12:00	Lancaster
	Poster Setup	8:00-12:00	Carlisle
	Exhibit Setup	8:00-12:00	Carlisle
Afternoon	Registration	12:00-5:00	Lobby
	Posters, Sponsors	12:00-5:00	Carlisle
	Student Oral Competition Part I	1:00-5:48	Lancaster
Evening	President's Reception	6:00-6:30	Carlisle
	Theme Session	6:30-8:00	Juniata
	Linnean Games	8:30-10:30	Juniata
	Sunday, March 20		
Morning	Registration	8:00-12:00	Lobby
	Executive Committee Meeting	8:00-12:00	Metropolitan A
	Student Poster Competition	8:00-12:00	Carlisle
	Posters, Sponsors	8:00-12:00	Carlisle
	IDEP Symposium	8:00-12:00	Lancaster
	Education Symposium	8:00-12:00	Leland
	Pollinator Symposium	8:00-12:00	Gettysburg
Afternoon:	Registration	12:00-5:00	Lobby
	Woody Plants Symposium	1:00-5:00	Lancaster
	Student Symposium	1:00-5:00	York
	Asa Fitch Award Winner	1:30-1:50	Leland
	Submitted Oral Presentations	2:00-5:00	Leland
Evening:	Social and Cash Bar	5:30-6:00	Carlisle
	Banquet and Awards	6:00-8:30	York
	Monday, March 21		
Morning:	Final Business Meeting	8:00-9:00	Leland
	Adjourn	9:00	

Second Floor Plan





2011 Sponsors (to be edited)

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2011 Eastern Branch ESA Award Winners

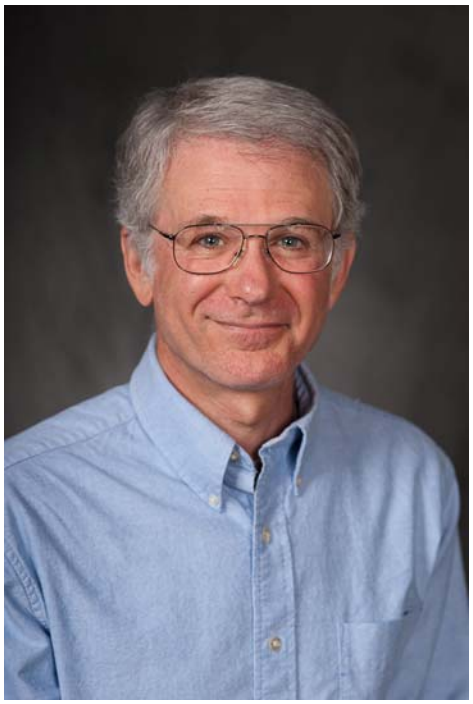
ESA Achievement Award in Teaching

Michael Saunders

Dr. Michael C. Saunders received his BS in Zoology from Duke University, his MS in Biology from Old Dominion University, and his Ph.D. in Entomology from the University of Georgia. Following a postdoctoral appointment at Texas A&M University, he was hired at Penn State University in 1985. Presently, he is a Professor of Entomology and a member of the faculties of the Intercollege Degree Program in Ecology, and the Dual Degree Program in Operations Research. His research focuses on a) the ecology and management of arthropods affecting vineyards, and b) systems modeling. His Teaching responsibilities include “Introductory Entomology”, “Ecology and Agroecosystems”, and Insect Natural History. He is the graduate program coordinator in the Entomology Department.

ESA Achievement Award in Extension

Shelby Fleischer



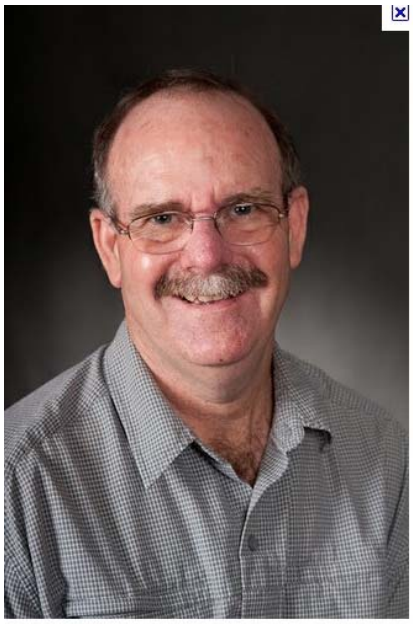
Dr. Shelby J. Fleischer joined Penn State in 1991, where he is a Professor of Entomology. He received a B.S. in biology from St. Mary's College of Maryland, lab experience at George Washington University, MS and PhD degrees in Entomology from Virginia Tech and Auburn University, and postdoc experience at Virginia Tech. Shelby strives to advance our understanding of the structure, dynamics, and management of insect populations and communities in agricultural systems. He has served on graduate programs for 45 students, in Entomology, Ecology, Horticulture, Plant Pathology, Ag Economics, and Statistics. He has produced 67 refereed publications, 94 non-refereed publications, and over 135 presentations at professional meetings. He was a keynote speaker to the Eastern Branch, a subject editor for Environmental Entomology for 8 years, and a USDA grants panel member on 5 occasions. Shelby strives to advance IPM in vegetable production systems, with a priority of advancing economically feasible management that improves worker and environmental safety. Extension is rooted in education, and Shelby goes wherever necessary to reach relevant audiences. He has given talks in churches, bars, restaurants, packinghouses, fields, barns, elementary schools, and produce auction platforms. Shelby addresses all audiences so that they can better understand, appreciate, and manage the arthropod community that they interact with as they strive to sustain their farm or business. Shelby also advances pest-monitoring by integrating web and geographic information systems. His most recent – PestWatch – initiated to alert vegetable growers to the influx of annual migratory lepidopterans, utilizes interactive cartography to visualize migratory processes. Participants from over 29 states and a Canadian province used this tool in 2010.

Entomological Foundation Award for Excellence in

Integrated Pest Management

Sponsored by Syngenta Crop Protection

Ed Rajotte



For the last 25 years **Dr. Edward Rajotte** has concentrated on the development, implementation and analysis of integrated pest management (IPM) and other sustainable agriculture systems both domestically and internationally. He has responsibilities in research, resident education and outreach education. Currently, Dr. Rajotte is the Extension Coordinator for the Pennsylvania Integrated Pest Management Program (PAIPM). Dr. Rajotte has national and international collaborative research and extension projects in agricultural and urban systems. In agricultural systems he is currently working on tree fruit, Christmas trees and vegetables as well as bee diseases and pollinator ecology. Several state and federal grants support this work. In urban systems, the PAIPM program works to provide IPM education in underserved communities where pests and pesticide misuse affects human health. Specific program components include bedbug research and extension, activities of the Philadelphia School and Community IPM Partnership and multilingual IPM education for pre-schools. More recently, Dr. Rajotte has been a principal investigator on a project funded by the U.S. Department of Education and the European Union to form better collaborations between U.S. and European universities. This project has allowed several faculty exchanges, long-term graduate student research opportunities and in-depth undergraduate study tours. Dr. Rajotte has authored or co-authored more than 100 scholarly publications, chapters and reports. He is past chair of the USDA Northeast Research, Extension and Academic Program for IPM. He has recently been appointed National IPM Liaison to the National Association of State Universities and Land Grant Colleges. In addition, he is on the national steering committee of ipmPIPE, and national, web-based, pest and disease tracking system.

Eastern Branch L. O. Howard Distinguished Achievement Award

Anthony Shelton

Dr. Anthony (Tony) Shelton's program is recognized worldwide for its excellence and breadth in developing crop protection practices based on sound ecological concepts and its ability to shepherd these practices into commercial practices. During the early phases of his research career at Cornell, he focused on developing the core components of IPM for the major vegetable crops in the Northeast: monitoring, sampling methods, thresholds and control strategies for the diverse set of insect pests infesting crucifers, sweet corn and onions. His program is credited with developing an IPM program for processing sweet corn that led to a nearly 50% reduction in the use of insecticides. Similarly, his efforts on cabbage led to a 45% reduction in insecticide use and a nearly 50% increase in efficacy of insecticides, while maintaining high quality standards for the harvested product. As a major component of IPM, his efforts have also focused on host plant resistance. His early studies identified cabbage germplasm with resistance to onion thrips and Tony worked with companies to help them develop thrips-resistant varieties that are now the central control tactic for this pest on cabbage. For the last 25 years, his program has also conducted extensive studies on the ecology of the thrips complex in the varied agroecosystems typical of the northeast and used this information to devise strategies for controlling onion thrips affecting cabbage and onion. Tony has developed a strong program in insecticide resistance management (IRM) to conventional insecticides and Bt crops. His program has used the model system of Bt broccoli and the diamondback moth to: explore the usefulness of refuges for conserving susceptible alleles; compare separate and mixed refuges; examine the durability of single vs. dual Bt, and; explore the potential for inducible promoters to create 'within-plant' refuges. In addition to these studies on IRM, he and his colleagues have conducted studies comparing the effects of Bt proteins and traditional insecticides on non-target arthropods. Their 2008 studies on the parasitoid *Diadegma insulare* provided the first evidence that Bt plants were far safer to a parasitoid than conventional insecticides, and his lab is now expanding these efforts and studying the role of parasitoids and predators on resistance evolution in the host. Tony's work has been published in a wide variety of journals, including ESA and other entomological journals, and in PNAS, PLoS and Nature Biotechnology. He regularly serves on USDA, EPA and NSF panels and his program has been supported by a wide variety of grants. Tony has received two ESA national awards: the Award for Excellence in Integrated Pest Management (1995) and the Recognition Award in Entomology (2005). In 2007, he was awarded Cornell's College of Agriculture and Life Sciences Award for Applied Research and in 1997 the New York State Award for Excellence in IPM. In 2010 he was elected a Fellow of the ESA.

Herb Streu Meritorious Service Award

Roger Youngman

Dr. Roger R. Youngman joined the Department of Entomology at Virginia Tech as an Assistant Professor in November 1988. He was promoted to full Professor in 2002. He has been a member of ESA since 1980 and an active member of the Eastern Branch since 1989. Rod has served the Eastern Branch in various capacities over the years. He was a conference moderator for Submitted Papers, Sections E & F, at the 1991 annual meeting in Richmond, VA. From 1991-93 he served as a member on the Finance Committee and then as Chair from 1993-94. He also served on the Auditing Committee from 1993-94. Rod next served as Secretary of the Eastern Branch from 2001-07 (two terms). Following his service as Secretary, Rod was elected President-elect in 2008 and presided over the Eastern Branch's 80th anniversary annual meeting. Other duties include listserv manager from 2004-08 and manager of the Eastern Branch web site since 2001. He worked with a programmer to develop online submission and data storage programs for members interested in giving talks and posters at Eastern Branch annual meetings. During his time as Secretary, Rod has worked with the Executive Committee, Parliamentarian, and Rules Committee to bring about changes to the Eastern Branch Constitution and Bylaws that better reflect the way the Eastern Branch does business. In addition, Rod played a significant role in encouraging ESA to allow their electronic voting process to be used for branch elections. The Eastern Branch enjoys the recognition of being the first branch in The Society to hold an election administered through ESA's electronic voting process. Perhaps Rod's most significant contribution to how the Eastern Branch conducts its business was to move to an all electronic mailing and announcement format. The Branch now saves over two thousand dollars annually by having done away with the escalating costs of postage, envelopes, and printing for two mailings a year.

John Henry Comstock Award

Akito Kawahara

Dr. Akito Kawahara was raised in Japan and the United States, and gained an appreciation for entomology during his childhood in Japan. He completed his undergraduate degree in Entomology at Cornell University in 2002. He graduated with a Master's degree in Entomology from the University of Maryland in 2007. He continued as a Ph.D. student in the Department of Entomology at Maryland, and completed his dissertation in July 2010. He is currently a postdoctoral fellow at the University of Hawaii, Manoa, researching the radiation of amphibious and carnivorous *Hyposmocoma* case-making moths. His interests include the systematics of Lepidoptera, molecular phylogenetics, and cultural entomology. For his dissertation, he specialized in the molecular phylogenetics, systematics, and life-histories of a leaf-mining moth superfamily (Gracillarioidea). He is expected to begin as an assistant professor at the University of Florida, Gainesville, in 2011.

Asa Fitch Award

Erik Smith

Erik Smith was born on April 19th, 1983 in Ithaca, New York. He graduated from South Seneca High School in Ovid, New York in 2001. In 2005, Erik received a B.A. in Biology from Oswego State University in Oswego, New York. In summer 2010, Erik received a M.S. in Entomology from Cornell University under the direction of Dr. Brian A. Nault. In fall 2010, he began a Ph. D. program under Nault's guidance. Erik studies temporal and spatial population dynamics of onion thrips (*Thrips tabaci*) on weed species in New York's onion agro-ecosystem. This project has provided insight into management of thrips and the virus they spread to onion, Iris yellow spot virus.

Friday, March 18, 2011

Presidential Informal Reception	**Carlisle**	**6:00-8:00**

Saturday, March 19, 2011

Registration	**Lobby**	**8:00-5:00**

Yong-Lak Park, West Virginia University

Saturday Morning, March 19, 2011

Program Symposium **Lancaster** **8:00-12:00**

The Plague of the Brown Marmorated Stink Bug

Organizers: Tom Kuhar, Virginia Tech & Tracy Leskey, USDA-Appalachian Fruit Station

8:00 **Introduction**. Tom Kuhar, Virginia Tech and Tracy Leskey, USDA-Appalachian Fruit Station

8:10 **A brief history of that first spotting in the U.S., probable mode of dispersal, and web traffic to BMSB factsheet.** Karen Bernhard and Steve Jacobs, Penn State Cooperative Extension

8:25 **Basic biology of BMSB, current spread in North America, and research plans for 2011.** George Hamilton, Rutgers University

8:50 **Insecticide toxicity data from Virginia and research plans in 2011.** Tom Kuhar, Virginia Tech

9:00 **BMSB activities in ornamental systems and research plans for 2011.** Paula Shrewsbury, Mike Raupp, and Holly Martinson, University of Maryland

9:15 **Damage Assessments of BMSB in NJ Fruit Crops and research plans for 2011.** Dean Polk, Rutgers NJAES, PE Marucci Center for Blueberry & Cranberry Research & Extension

9:30 **Impact of BMSB on wine grapes and research plans for 2011.** Doug Pfeiffer, Virginia Tech

9:45 **BMSB impact on vegetable and field crops in the Mid-Atlantic and research plans for 2011.** Galen Dively, University of Maryland

10:00 **Break**

10:10 **BMSB impact on tree fruit, update on trapping/monitoring research, and research plans for 2011.** Tracy Leskey, USDA-ARS Appalachian Fruit Station

10:30 **BMSB Management in Orchards and research plans for 2011.** Greg Krawczyk, Penn State

10:45 **BMSB from the perspective of an urban PCO.** Rick Cooper, Rutgers

11:00 **BMSB Management Options and Strategies from a Plant Protection Industry Perspective.** Jim Steffel and Michelle Meck, LABServices, Hamburg, PA

11:15 **Natural enemies of the BMSB and prospects for classical biological control.** Kim Hoelmer, USDA-ARS Beneficial Insects Lab, Newark, DE

11:30 **Q & A, General Discussion**

Saturday Afternoon, March 19

Student Oral Presentation Competition **Lancaster** **1:00-5:48**

See appendix C for abstracts of talks for this session

Moderator**:** Timothy Tomon, West Virginia Department of Agriculture

1:00 **Scarabaeoidea (Coleoptera) of Eastern Maryland.** Ryan E Johnston, Salisbury University, Dept. of Biological Sciences, 1101 Camden Avenue, Salisbury, MD 21801; Dana L. Price, Salisbury University, Dept. of Biological Sciences, 1101 Camden Avenue, Salisbury, MD 21801

1:12 **Interaction between *Beauveria bassiana* GHA and entomopathogenic nematodes for control of *Cyclocephala* spp. (Coleoptera: Scarabaeidae).** Shaohui Wu, Virginia Tech, Dept. of Entomology, 301B Price Hall, Blacksburg, VA 24061; Roger R Youngman, Virginia Tech, Dept. of Entomology, 308 Price Hall, Blacksburg, VA 24061, Loke T Kok, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061, William R Kuhn, Virginia Tech, Dept. of Entomology, 209 Price Hall, Blacksburg, VA 24061, Curt A Laub, Virginia Tech, Dept. of Entomology, 308 Price Hall; Dept. of Entomology, Blacksburg, VA 24061

1:24 **Feeding in a full house: Can adaptive foraging and diversity tell us anything about how the invasive species *Sirex noctilio*'s populations will behave in North America?** Brian M Thompson, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg, College Park, Maryland 20742; Daniel S Gruner, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg,; College Park, Maryland 20742

1:36 **Wasting eggs with self-superparasitism: The effects of host species and host diet.** Christina M Harris, Penn State University, Dept. of Entomology, 120 Chemical Ecology Lab, Orchard Road, University Park, PA 16802; James H Tumlinson, Penn State University, Dept. of Entomology, 113 Chemical Ecology Lab, Orchard Road, University Park, PA 16802

1:48 **Sub-lethal doses of herbicide can increase susceptibility to aphid populations**. Eric Bohnenblust, Penn State University, Dept. of Entomology, 101 Merkle Buidling Orchard Rd, University Park, PA 16802; John Tooker, Penn State University, Dept. of Entomology, 101 Merkle Building Orchard Rd, University Park, PA 16802

2:00 **Functional and numerical response of *Laricobius* spp. predators (Coleoptera: Derodontidae) on hemlock woolly adelgid, *Adelges tsugae* (Hemiptera: Adelgidae)**. Ligia C Vieira, Virginia Tech, Dept. of Entomology, 311 Price Hall, Blacksburg, VA 24061; Scott M Salom, Virginia Tech, Dept. of Entomology, 210 Price Hall, Blacksburg, VA 24061; Loke T Kok, Virginia Tech, Dept. of Entomology, 216A Price Hall, Blacksburg, 24061

2:12 **Assessing *Eucryptorrhynchus brandti* as a potential carrier for *Verticillium albo-atrum* from infected *Ailanthus altissima*.** Amy L Snyder, Virginia Tech, Dept. of

Entomology, Blacksburg, VA, 24061; Scott M Salom, Virginia Tech, Dept. of Entomology, Blacksburg, VA, 24061; Loke T Kok, Virginia Tech; Dept. of Entomology, Blacksburg, VA, 24061; Gary J Griffin, Virginia Tech, Dept. of Plant Pathology, Blacksburg, VA, 24061; Donald D Davis, Penn State University; Dept. of Plant Pathology, University Park, PA

2:24 **Effect of two semiochemical attractants on *Frankliniella* spp. thrips.** Heather E Andrews, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Thomas P Kuhar, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061;; Doug Pfeiffer, Virginia Tech, Dept. of Entomology, 205C Price Hall, Blacksburg, VA 24061; Ames Herbert, Virginia Tech, Dept. of Entomology, Tidewater AREC, 6321 Holland Rd., Suffolk, VA 23437; Pete Schultz, Virginia Tech, Dept. of Entomology, Hampton Roads AREC, 1444 Diamond Springs Rd., Virginia Beach, VA 23455; Helene B Doughty, Virginia Tech, Dept. of Entomology, Hampton Roads AREC, 1444 Diamond Springs Rd., Virginia Beach, VA 23455

2:36 **Effects of Cucumber mosaic virus infection on plant chemistry and vector behavior.** Kerry E Mauck, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802; Consuelo M De Moraes, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802; Mark C Mescher, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802

2:48 **Interactions between *Lygus* bugs and *Erigeron annuus*: Applications toward a trap crop system for the tarnished plant bug.** Sean T Halloran, Penn State University, Dept. of Entomology, 118 Chemical Ecology Lab,; University Park, PA 16802; James H Tumlinson, Penn State University, Dept. of Entomology, 111 Chemical Ecology Lab, University Park, PA 16802

3:00 Break

3:12 **Chemical ecology of *Philornis downsi* (Diptera: Muscidae): An invasive avian parasite of the Galapagos Islands.** Robert M Collignon, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, 1 Forestry Dr, 150 Illick, Syracuse, NY 13210; Stephen A Teale, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, 1 Forestry Dr; 151 Illick; Syracuse, NY 13210

3:24 **Assessing susceptibility of three Hymenoptera parasitoids of emerald ash borer to the entomopathogenic fungi *Beauveria bassiana*.** Kimberly M Dean, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Syracuse , NY 13210; Melissa K Fierke, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, 1 Forestry Drive; Syracuse, NY 13210; John D Vandenberg, USDA-ARS, Robert W. Holley Center, Room 324, Tower Road, Cornell University, Ithaca, NY 14853

3:36 **Analysis of gut contents to determine the effect of flowering plants and alternative prey on predation by *Orius insidiosus* (Say) on European corn borer eggs.** Matthew W Bickerton, Rutgers University, Dept. of Entomology, 93 Lipman Drive, New Brunswick, NJ 08901; Rong Di, Rutgers University, Dept. of Plant Science,

Biotech Center, 59 Dudley Rd., New Brunswick, NJ 08901; George C Hamilton, Rutgers University, Dept. of Entomology, 93 Lipman Drive, New Brunswick, NJ 08901

3:48 **Determination of risk factors associated with the infestation of Virginia vineyards by larvae of the grape root borer (Lepidoptera: Sesiidae).** Jhalendra P Rijal, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Carlyle C Brewster, Virginia Tech, Dept. of Entomology, 202 Price Hall, Blacksbrug, VA 24061; James C Bergh, Virginia Tech, Dept. of Entomology, 595 Laurel Grove Road; Winchester, VA 22602

4:00 **Investigating factors in host plant selection of harlequin bug (*Murgantia histrionica*) (Hahn).** Anna K Wallingford, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Thomas P Kuhar, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Peter B Schultz, Virginia Tech, Dept. of Entomology, 1444 Diamond Spring Rd., Hampton Roads AREC; Virginia Beach, VA 23455

4:12 **Using macroinvertebrates to determine ecological function of agricultural drainage ditches.** Alan W Leslie, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg, College Park, MD 20742; William O Lamp, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg, College Park, MD 20742

4:24 **Effects of white-tailed deer browsing on insect diversity in the Alleghany hardwood forests.** Laura A Wheatall, Indiana University of Pennsylvania, 101 Art Crest Drive, Butler, PA 16001; Tim Nuttle, Indiana University of Pennsylvania, 114 Weyandt Hall, Indiana, PA 15705; Ellen Yerger, Indiana University of Pennsylvania, 114 Weyandt Hall; Indiana, PA 15701

4:36 **Effects of genetic diversity and inbreeding on plant-insect interactions in horsenettle (*Solanum carolinense* L).** Rupesh Kariyat, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Kerry Mauck, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Consuelo m De Moraes, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Mark C Mescher, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Andrew G Stephenson, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802

4:48 **Quantifying emergence phenology of the exotic *Sirex noctilio* F. and the native siricid-parasitoid complex in New York.** Christopher R Standley, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210; Dylan Parry, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210; Melissa K Fierke, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210

5:00 **A comparison of Lepidopteran community composition, diversity and stand characteristics in high and low ash (*Fraxinus* spp.) density stands in New York.** Peter J Rockermann, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive; Syracuse, NY 13210,

Melissa K Fierke, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210

5:12 **Origins of *Synsphyronus* diversity in a global biodiversity hotspot.** Roberta Engel, Univ. of Connecticut, 75 N. Eagleville Road, Unit 3043, Storrs, CT 06269-3043; Mark S. Harvey, Western Australian Museum, Dept. of Terrestrial Invertebrates, Welshpool DC, Western Australia, AUS 6986; Elizabeth Jockusch, Univ. of Connecticut, 75 N. Eagleville Road, Unit 3043, Storrs, CT 06269-3043

5:24 **Management of Colorado potato beetle (*Leptinotarsa decemlineata* Say) with tolfenpyrad.** Adam F Wimer, Virginia Tech, Dept. of Entomology, Eastern Shore AREC, 33446 Research Dr; Painter, VA 23420; Thomas P Kuhar, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061

5:36 **Effects of insectivorous birds on arthropod communities, primary productivity, and plant architecture in mangrove forests**. Alexander J Forde, University of Maryland, Dept. of Entomology, College Park, MD 20742; Ilka C Feller, Smithsonian Environmental Research Center, Edgewater, MD 21037; John D Parker, Smithsonian Environmental Research Center, Edgewater, MD 21037; Daniel S Gruner, University of Maryland, Dept. of Entomology, College Park, MD 20742

Saturday Afternoon, March 19, 2011

Student Poster Competition **Carlisle** **12:00-6:30**

See Appendix A for abstracts of poster of this section

[Author attendance at posters required during the President's Reception, Saturday evening]

1. **Higher larval mortality and delayed development of the mosquitoes *Aedes albopictus* and *A. triseriatus* due to leaf litter resources grown in elevated atmospheric CO_2.** Cassandra D Smith, University of Maryland, Dept. of Environmental Science and Technology, College Park, MD 20742; Andy Baldwin, University of Maryland, Dept. of Environmental Science and Technology, College Park, MD 20742; Joseph Sullivan, University of Maryland, Dept. of Plant Sciences and Landscape Architecture, College Park, MD 20742; Paul Leisnham, University of Maryland, Dept. of Environmental Science and Technology, College Park, MD 20742

2. **Isolation mechanisms of two genetically distinct groups of the parasitoid *Cotesia congregata* (Hymenoptera: Braconidae).** Justin P Bredlau, Virginia Commonwealth University, Dept. of Biology, 1000 W Cary St, Richmond, VA 23284; Karen M Kester, Virginia Commonwealth University, Dept. of Biology, 1000 W Cary St, Richmond, VA 23284

3. **Wetland detritus effects on survival and development of the northern house mosquito (*Culex pipiens*).** Brandon Scott, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20742; Paul Leisnham, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20742; Andrew Baldwin, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20742

4. **Mosquito vector ecology along a socioeconomic gradient in residential Washington, D.C.** Zara R Dowling, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20740; Peter Armbruster, Georgetown University, Washington, D.C.; Shannon LaDeau, Cary Institute for Ecosystem Studies; Millbrook, NY; Paul Leisnham, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20740

5. **Bacterial symbionts associated with the salivary glands of the potato leafhopper, *Empoasca fabae*.** Bridget D DeLay, University of Maryland, Dept. of Entomology, 4136 Plant Sciences Building, College Park, MD 20742-4454; William O Lamp, University of Maryland, Dept. of Entomology, 4112 Plant Sciences Building, College Park, MD 20742-4454

6. **Attracting beneficial insects in apple orchard using cowpea as a cover crop.** Sunghoon Baek, West Virginia University, Division of Plant and Soil Science, Morgantown, WV 26505; Charles W Lewis, West Virginia University, Division of Plant and Soil Science,

Morgantown, WV 26505; Yong-Lak Park, West Virginia University, Division of Plant and Soil Science, Morgantown, WV 26505

7. **[CANCELLED] Urbanization impacts adult caddisflies (Trichoptera) to reduce richness of in-stream, larval assemblages.** Robert F Smith, University of Maryland, Dept. of Entomology, 4112 Plant Sciences Building, College Park, MD 20742-4454; William O Lamp, University of Maryland, Dept. of Entomology, 4112 Plant Sciences Building, College Park, MD 20742-4454

8. **Characterizing spatial distribution pattern of squash bug (*Anasa tristis*, Coreidae: Hemiptera) using multiple geostatistical methods.** Vimal Varghees, West Virginia University, Division of Plant and Soil Sciences, PO Box 6108, Morgantown, WV 26505; Yong-Lak Park, West Virginia University, Division of Plant and Soil Sciences, PO Box 6108, Morgantown, WV 26505

9. **Pesticide adjuvants and inert ingredients may impair foraging behavior in honey bees (*Apis mellifera*).** Timothy J Ciarlo, Penn State University, Dept. of Entomology, State College, PA 16803; Christopher A Mullin, Penn State University, Dept. of Entomology, 512 ASI Building, University Park, PA 16802; James L Frazier, Penn State University, Dept. of Entomology, 518 ASI Building, University Park, PA 16802

10. **Wild bee diversity in Brooklyn, NY community gardens.** Mohammed T Al-Sayegh, 155 E. 31st St.; Apt.# 19B; Manhattan, NY 10016; Timothy W Leslie, 1 University Plaza; 801M; Brooklyn, NY 11210

11. **Effects of host plant (Horsenettle; *Solanum carolinense* L) genetic diversity and inbreeding on feeding preference and oviposition behavior of specialist herbivore (Tobacco hornworm; *Manduca sexta* L).** Rupesh Kariyat, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Sarah Scanlon, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Ryan Moraski, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Christopher Balogh, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Consuelo M De Moraes, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Mark C Mescher, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Andrew G Stephenson, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802

12. **Resistance in Colorado potato beetles, *Leptinotarsa decemlineata* (Say), to spinosyn insecticides in Suffolk County, NY - A comparison of organic and traditional fields.** Kathleen Schnaars Uvino, Queens College, Dept. of Biology, Graduate Center, 6530 Kissena Blvd, Flushing, NY 11367; Mitchell Baker, Queens College, Dept. of Biology, 6530 Kissena Blvd, Flushing, NY 11367

13. **Contributions of nighttime predation and crop genotypic diversity to pest suppression.** Ian M Grettenberger, Penn State University, Dept. of Entomology, 101 Merkle Building, University Park, PA 16802; John F Tooker, Penn State University, Dept. of Entomology, 113 Merkle Building, University Park, PA 16802

14. **[CANCELLED] Does miticide exposure affect honey bee pheromone production?** Daniel Schmehl, Penn State University, Dept. of Entomology, 1 Chemical Ecology Building,

University Park, PA 16802; Christina Grozinger, Penn State University, Dept. of Entomology, 4a Chemical Ecology Building, University Park, PA 16802; James Tumlinson, Penn State University, Dept. of Entomology, 111 Chemical Ecology Building, University Park, PA 16802

15. **An assessment of thrips (Thysanoptera: Thripidae) spatial positioning in soybean.** Jessica A Samler, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437; David A Herbert, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437; David Owens, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437; Sean Malone, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437

16. **Detection and characterization of *Culex flavivirus* transmission in Zambian *Culex quinquefasciatus* mosquitoes.** Paul L Maurizio, 615 N. Wolfe St.; E3402; Baltimore, MD 21205, Douglas E Norris, 615 N. Wolfe St.; E3628; Baltimore, MD 21205

17. **How the fitness of male *Aedes albopictus* (Culicidae: Diptera) can be effected by sugar availability.** Alexandra Villiard, 180 Jones Ave; New Brunswick, NJ 08901, Randy Gaugler, 180 Jones Ave; New Brunswick, NJ 08901

Saturday Evening, March 19

Presidents Reception **Carlisle** **6:00-6:30**

(open to all attendees, including students)

Theme Session **Juniata** **6:30-8:00**

Future Survival of Entomology:
Traditional Departments or Interdisciplinary Groups

Panel discussion:

Jeff Scott, Department Chair, Cornell University
Gary Felton, Department Chair, Penn State University
Anne Averill, Department of Plant, Soil, and Insect Sciences, University of Massachusetts
Frank Drummond, School of Biology and Ecology, University of Maine

Linnaean Games **Juniata** **8:30-10:30**

Coordinator – Douglas G. Pfeiffer

Sunday Morning, March 20

Submitted Poster Presentations **Carlisle** **8:00-5:00**

See Appendix B for abstracts of poster of this section

[Author attendance at posters during President's Reception, Saturday Evening]

18. Andropolymorphism in *Eucheyletia* near *bishoppi* (Acari : Trombidiformes : Cheyletidae). Norman J Fashing, College of William and Mary, Dept. of Biology, Williamsburg, VA 23187-8795; Kathryn Born, PO Box 200663; Arlington, TX 76006

19. Dung beetles of Maryland's Eastern Shore. Dana L Price, Salisbury University, Dept. of Biological Sciences, 1101 Camden Avenue, Salisbury, MD 21801; Lauren Brenneman, Salisbury University, Dept. of Biological Sciences, Salisbury, MD 21801; Ryan E Johnston, Salisbury University, Dept. of Biological Sciences, Salisbury University, MD 21801

20. Striped cucumber beetle phenology and pollinator activity in organic cucurbits. Amanda Bachmann, Penn State University, Dept. of Entomology, 509 ASI; University Park, PA 16802; C.S. Sidhu, Penn State University, Dept. of Entomology, 530 ASI; University Park, PA 16802; Dave Biddinger, Fruit Research & Extension Ctr.; PO Box 330, Biglerville, PA 17307, Shelby Fleischer, Penn State University, Dept. of Entomology, 510 ASI, University Park, PA 16802

21. Do Tiphiid wasps use herbivore-induced plant volatiles for finding white grubs? Piyumi T Obeysekara, University of Connecticut, Dept. of Plant Science and Landscape Architecture, Storrs, CT 06269; Ana Legrand, University of Connecticut, Dept. of Plant Science and Landscape Architecture, Storrs, CT 06269

22. Acarine - Passalid beetle symbioses. James R Philips, Babson College, Math/Science Division, Babson Park, MA 02457-0310

23. A trap crop system for managing tarnished plant bug damage in strawberries. Stephen Hesler, Cornell University, Dept. of Entomology, NYSAES, 630 W. North St., Geneva, NY 14456; Greg Loeb, Cornell University, Dept. of Entomology, NYSAES, 630 W. North St., Geneva, NY 14456; Marvin Pritts, Cornell University, Dept. of Horticultural Sciences, Ithaca, NY 14853

24. Do pollen mites show bee gender preference? Matthew I McKinney, 409 Arch St.; Apt. B; Morgantown, WV 26501; Yong-Lak Park, West Virginia University, Division of Plant and Soil Sciences, Morgantown, WV 26506

25. Lepidoptera larvae susceptibility to foliar extracts from the Tree-of-Heaven, *Ailanthus altissima*. Ryan L Wagner, Millersville University, 288 Roddy Hall, 50 E. Frederick Street, Millersville, PA 17551-0302; Chris M Dower, Millersville University, 288 Roddy Hall, 50 E. Frederick Street, Millersville, PA 17551-0302

26. Geographic variation in diapause induction: The grape berry moth (Lepidoptera: Tortricidae). Jody H Timer, LERGR&EC; 662 N Cemetery Rd; North East, PA 16428; Patrick C Tobin, USDA, Forest Service, Morgantown, WV; Michael C Saunders, Penn State University, Dept. of Entomology, University Park, PA

27. Using metagenomics to resolve the process of wood digestion in the Asian longhorned beetle (*Anoplophora glabripennis*). Erin D Scully, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802

Sunday Morning, March 20

IDEP Symposium **Lancaster** **8:00-12:00**

Insect Detection, Evaluation and Prediction Symposium:

Insect Detection, Evaluation and Prediction (IDEP) Symposium: New Pests and New Information on Familiar Foes

Organizer: Robert Trumbule, Maryland Department of Agriculture

8:00 Introduction

8:10 Asian longhorned beetle: Eradication efforts in New England. Christine Markham, National Program Director, Asian Longhorned Beetle (ALB) Eradication Program, USDA Animal Plant Health Inspection Service (APHIS), Raleigh, NC

8:40 Japanese maple scale: What have we learned about this economically important exotic pest? Paula Shrewsbury, Dept. of Entomology, University of Maryland, College Park, MD; Stanton Gill, Dept. of Entomology, University of Maryland, College Park, MD

9:10 Emerald ash borer update: A lesson from Maryland. Dick Bean, Maryland Dept. of Agriculture, Annapolis, MD.

9:40 Break

10:00 Brown marmorated stink bug: A stinker in our landscapes and nurseries. Michael J. Raupp, Dept. of Entomology, University of Maryland, College Park, MD.

10:30 Rearing and splitting to know: New insights into the New York siricid complex. Melissa K. Fierke, Dept. of Environmental & Forest Biology, SUNY College of Environmental Science and Forestry, Syracuse, NY

11:00 Japanese cedar longhorned beetle, *Callidiellum rufipenne*. Sven-Erik Spichiger, Entomology Program Manager, Pennsylvania Department of Agriculture, Harrisburg, PA

11:30 Discussion

12:00 Adjourn

Sunday Morning, March 20

Education Symposium **Leland** **8:00-12:00**

Teaching Entomology at Various Educational Levels: Perspectives, Techniques, and Challenges

Organizer: Matt Wallace, East Stroudsburg University of Pennsylvania

8:00 Introduction

8:05 Human anatomy & physiology and insects? Entomology in a biology department: challenges & successes. Matthew S. Wallace, Biological Sciences, East Stroudsburg University of Pennsylvania, East Stroudsburg, PA

8:30 Teaching entomology to non-entomologists: life at a liberal arts university. Greg Paulson, Biology, Shippensburg University of Pennsylvania, Shippensburg, PA

8:55 The challenges of teaching an undergraduate entomology service course. Fred P. Hain, Dept. of Entomology, North Carolina State University, Raleigh, NC

9:20 What's the buzz? How to educate the public (and reluctant students) about bees. Elizabeth C. Evans, Dept. of Biology, Bucknell University, Lewisburg, PA

9:45 Break

10:00 The life of an entomology teaching assistant: motivating students to learn in non-traditional subject areas. Bob Smith, Dept. of Entomology, University of Maryland, College Park, MD

10:25 Together we can: kids and insects. Claudia Hill and Colette Flory, Volunteer Leaders for Monroe County 4-H Insects Are Us Club, PA.

10:50 Teaching in industry: using entomology to turn a job into a career. Nancy Troyano, Rentokil North American Pest Control, Reading, PA.

11:15 Educating the commercial grower. Suzanne Wainwright-Evans, Buglady Consulting, Slatington, PA

11:40 Discussion

12:00 Adjourn

Sunday Morning, March 20

Pollination Symposium **Gettysburg** **8:00-12:00**

Pollinators and Pesticides

Organizer: David Hawthorne, University of Maryland

8:00 Introduction

8:10 Protocol development for assessment of pesticide risks to honey bees. Robyn Rose USDA, APHIS, Washington, D.C.

8:40 Is *Apis mellifera* more sensitive to insecticides than other insects? Melissa Hardstone**,** The Connecticut Agricultural Experiment Station Center for Vector Biology & Zoonotic Diseases, New Haven, CT

9:10 Are we underestimating the impacts of pesticides on honey bees? Wanyi Zhu, Daniel Schmehl, J.L. Frazier, M.T. Frazier, and C. Mullin, Dept. of Entomology, Penn State University, State College, PA

9:40 Break

10:00 Measuring pesticides in pollen and nectar. Kimberly Stoner, The Connecticut Agricultural Experiment Station, New Haven, CT

10:30 Sublethal effects of imidacloprid, alone or in combination with other pesticides, on honeybees. Josephine Johnson, University of Maryland and USDA-ARS Bee Research Laboratory Beltsville, MD; Jeff Pettis, USDA-ARS Bee Research Laboratory Beltsville, MD; Galen Dively, Dept. of Entomology, University of Maryland, College Park, MD

11:00 Mechanism-based strategies for discovering adverse pesticide interactions in honey bees. David Hawthorne, Dept. of Entomology, University of Maryland, College Park, MD

11:30 Discussion

12:00 Adjourn

Sunday Afternoon, March 20

Woody Plant Symposium **Lancaster** **1:00-5:00**

Pests of Woody Plants

Co-Moderators:
Daniel Gilrein, Cornell Cooperative Extension of Suffolk County
Dr. Melissa Fierke, SUNY College of Environmental Science and Forestry

1:00 **Introduction and welcome.** Melissa Fierke, SUNY College of Environmental Science and Forestry, Syracuse, NY

1:05 **Forest tent caterpillar: New insights into an old defoliator.** Dylan Parry, Dept. of Environmental and Forest Biology, SUNY College of Environmental Science and Forestry, Syracuse, NY

1:35 **Biological control of an old (but invasive) nursery pest, *Xylosandrus germanus.*** John Vandenberg, Biological Integrated Pest Management Unit, USDA Agricultural Research Service, Robert W. Holley Center, Ithaca, NY

2:05 **Plant-insect interactions of the Asian longhorned beetle and its host trees.** Kelli Hoover, Dept. of Entomology, Penn State University, State College, PA

2:35 **Girdling and peeling to know - Emerald ash borer research and management in New York.** Melissa Fierke, Dept. of Environmental and Forest Biology, SUNY College of Environmental Science and Forestry, Syracuse, NY

3:05 **Break**

3:15 **The recent introduction and expansion of Hemlock woolly adelgid populations in central NY.** Mark Whitmore, Forest Entomologist, Dept. of Natural Resources, Cornell University, Ithaca, NY

3:45 **New woody plant pests on the horizon.** Daniel Gilrein, Cornell Cooperative Extension of Suffolk County, Riverhead, NY

4:15 **Managing pests of ornamental plants: Goin' green, and results of some efficacy studies**. Daniel Gilrein, Cornell Cooperative Extension of Suffolk County, Riverhead, NY

4:45 **Discussion**

5:00 **Adjourn**

Sunday Afternoon, March 20

Student-Sponsored Symposium **York** **1:00-5:00**

Tools of the Trade: Technology in Entomology

Organizer: Lisa Moore, Chair, ESA-EB Student Affairs Committee

1:00 Introduction

1:10 Chasing that aerial biota: The challenge and how to succeed. Elson J Shields, Dept. of Entomology, Cornell University, Ithaca, NY

1:40 Synchrotron x-ray imaging for studying insect form and function. Jake Socha, Dept. of Engineering Science and Mechanics, Virginia Tech, Blacksburg, VA

2:10 Genomic analysis of social behavior in honey bees. Christina M Grozinger, Dept. of Entomology, Center for Pollinator Research, Penn State University, State College, PA

2:40 Break

3:00 Melding disparate tools in IPM project support: Information management in a large-scale gypsy moth program. Andy Roberts, Dept. of Entomology, Virginia Tech, Blacksburg, VA

3:30 Capability of harmonic radar systems to track insects. Heping Zhu, Agricultural Engineer, USDA-ARS Application Technology Research Unit, Wooster, OH

4:00 Biomechanics of insect locomotion and bio-inspired design. Dan Dudek, Dept. of Engineering Science and Mechanics, Virginia Tech, Blacksburg, VA

4:30 Discussion

5:00 Adjourn/industry mixer

Asa Fitch Award Presentation **Leland** **1:30-1:50**

Weed hosts of onion thrips (*Thrips tabaci)* and implications for *Iris yellow spot virus* epidemiology in onion

Erik A Smith, Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY

Co-Authors: Antonio DiTomasso, Marc Fuchs, Anthony M. Shelton, and Brian A. Nault

Sunday Afternoon, March 20

Submitted Oral Presentations **Leland** **2:00-4:46**

See Appendix D for abstracts of poster of this section

Co-Moderators**:**
Peter Jentsch, Cornell University
Joseph Ingerson-Mahar, Rutgers University

2:00 Introduction

2:10 Interactive effects of nutrient and genotype on cranberry resistance to herbivores. Cesar Rodriguez-Saona, PE Marucci Center, 125A Lake Oswego Rd, Chatsworth, NJ 08019; Nicholi Vorsa, PE Marucci Center, 125A Lake Oswego Rd, Chatsworth, NJ 08019; Jennifer Johnson-Cicalese, PE Marucci Center, 125A Lake Oswego Rd, Chatsworth, NJ 08019; Joan Davenport, WSU-IAREC, 24106 N. Bunn Road, Prosser, WA 99350

2:22 Field validation of subterranean termite (Isoptera, Rhinotermitidae) control with Recruit® HD, a new termite bait from Dow AgroSciences. Jackie A Lee, Blacksburg, VA 24060; Joe DeMark, Fayetteville, AR 72701; Joe Eger, Tampa, FL 33629; Mike Tolley, Indianapolis, IN 46268; Mike Lees, Granite Bay, CA 95746; Marc Fisher, Fresno, CA 93706; Ronda Hamm, Indianapolis, IN 46268; Mike Melichar, Indianapolis, IN 46268; Ellen Thoms, Gainesville, FL 32607

2:34 An integrated approach to management of grape berry moth in Virginia vineyards. Timothy A Jordan, Dept. of Entomology, Virginia Tech, 216A Price Hall, Blacksburg, VA 24061; Douglas G. Pfeiffer, Dept. of Entomology, Virginia Tech, 216A Price Hall, Blacksburg, VA 24061

2:46 Carabid mandible morphology: a glimpse at dietary preference? Joseph Ingerson-Mahar, Dept. of Entomology, Rutgers University, 243 Blake Hall; 93 Lipman Drive; New Brunswick, NJ 08901; James Lashomb, Dept. of Entomology, 93 Lipman Drive, New Brunswick, NJ 08901

2:58 Control of dogwood borer with mating disruption using an antagonistic sex pheromone. Arthur Agnello, Dept. of Entomology, Cornell University, NYS Agric. Expt. Sta., 630 W. North St., Geneva, NY 14456; David Kain, Dept. of Entomology, Cornell University, NYS Agric. Expt. Sta., 630 W. North St., Geneva, NY 14456

3:10 Commercial orchard study comparing organic materials to conventional tools for pear psylla management. Peter J Jentsch, Dept. of Entomology, Cornell University, 3357 Route 9W, Highland, NY 12528

3:22 Toward development of an effective monitoring trap for brown marmorated stink bug. Brent D Short, USDA-ARS AFRS; 2217 Wiltshire Road; Kearneysville, WV 25430;

Starker E Wright, USDA-ARS AFRS; 2217 Wiltshire Road; Kearneysville, WV 25430; Tracy C Leskey, USDA-ARS AFRS; 2217 Wiltshire Road; Kearneysville, WV 25430

3:34 **Effects of insecticide exposure on brown marmorated stink bugs: Mobility, mortality, and recovery.** Starker E Wright, USDA-ARS AFRS, 2217 Wiltshire Road, Kearneysville, WV 25430; Brent D Short, USDA-ARS AFRS, 2217 Wiltshire Road, Kearneysville, WV 25430; Torri J Hancock, USDA-ARS AFRS, 2217 Wiltshire Road, Kearneysville, WV 25430; John P Cullum, USDA-ARS AFRS, 2217 Wiltshire Road, Kearneysville, WV 25430; Tracy C Leskey, USDA-ARS AFRS, 2217 Wiltshire Road, Kearneysville, WV 25430

3:46 **Regional differentiation in the incidence of diapausing eggs reproductive tactics in the mosquito, *Aedes albopictus.*** Paul T Leisnham, Dept. Environmental Science & Technology, University of Maryland, 1443 Animal Sciences Bldg, College Park, MD 20742; Lauren Towler, Dept. Biological Sciences, Illinois State University, Normal, IL 61790; Steven A Juliano, Dept. Biological Sciences, Illinois State University, Normal, IL 61790

3:58 **DuPont Cyazypyr™ (DPX-HGW86, cyantraniliprole): unique insecticide for premium pest control in specialty crops.** Billy Annan, DuPont Company; Crop Protection; Stine-Haskell Research Center; Newark, DE. USA. 19714-0030

4:10 **Variation in the incidence, performance and impact of annual bluegrass weevil (*Listronotus maculicollis*) adults across greens-type turf grasses.** Daniel C Peck, Dept. Entomology, Cornell University, NYSAES, 630 W. North St., Geneva, NY 14456; David Huff, Dept. Crop and Soil Sciences, Penn State University, 210 Ag Sciences and Industries Bldg, University Park, PA 16802; Dan Olmstead, Dept. Entomology, Cornell University, NYSAES, 630 W. North St., Geneva, NY 14456; Frank Rossi, Dept. Horticulture, Plant Science Building, Cornell University; Ithaca, NY 14850; Akiko Seto, Dept. Entomology, Cornell University, NYSAES, 630 W. North St., Geneva, NY 14456; Masanori Seto, Dept. Entomology, Cornell University, NYSAES, 630 W. North St., Geneva, NY 14456

4:22 **Feeding strategy of spined soldier bugs (Hemiptera: Pentatomidae) on smooth, hairy and coleopteran larvae**. Sudan -- Gyawaly, Entomology Program, Division of Plant and Soil Science, West Virginia University, Morgantown, WV 26506; Yong-Lak Park, Entomology Program, Division of Plant and Soil Science, West Virginia University, Morgantown, WV 26506

4:34 **Viruses in hymenopteran pollinators.** Rajwinder Singh, Dept. of Entomology, Penn State University, 527 ASI Bldg., University Park, PA 16802; Abby L Levitt, Dept. of Entomology, Penn State University, 521 ASI Bldg., University Park, PA 16802; Edwin G Rajotte, Dept. of Entomology, Penn State University, 508 ASI Bldg., University Park, PA 16802; Diana L Cox-Foster, Dept. of Entomology, Penn State University, 536 ASI Bldg, University Park, PA 16802

Sunday Evening, March 20

Social and cash bar	**Carlisle**	**5:30-6:00**
Banquet and Awards	**York**	**6:00-9:00**

Remarks from ESA:

Grayson Brown, Vice-President, ESA

Debi Sutton, Director of Marketing, ESA

Paul Borth, P-IE Section Chair

Eastern Branch Awards:

L. O Howard
Herb Streu Meritorious Service
Distinguished Achievement Award for Teaching
Distinguished Achievement Award for Extension
Entomological Foundation Award for Excellence in Integrated Pest Management
Student Competition Awards: Poster
Student Competition Awards: Oral Competition

2011 Eastern Branch ESA Banquet Speaker:

Judson Reid
Extension Associate, CALS Cooperative Extension, Cornell University
(Vegetable Specialist)
"The Old Order Amish Society in Pennsylvania"

Monday Morning, March 21, 2011

Final Business Meeting	**Leland**	**7:00-8:00**

APPENDIX A

Student Poster Competition Abstracts

1. **Higher larval mortality and delayed development of the mosquitoes *Aedes albopictus* and *A. triseriatus* due to leaf litter resources grown in elevated atmospheric CO_2.** Cassandra D Smith, University of Maryland, Dept. of Environmental Science and Technology, College Park, MD 20742; Andy Baldwin, University of Maryland, Dept. of Environmental Science and Technology, College Park, MD 20742; Joseph Sullivan, University of Maryland, Dept. of Plant Sciences and Landscape Architecture, College Park, MD 20742; Paul Leisnham, University of Maryland, Dept. of Environmental Science and Technology, College Park, MD 20742. CO_2-enrichment can impact plants, such as increase growth rates and alter leaf chemistry. Such changes can affect leaf-feeding insects by altering the nutrition or toxicity of leaves. The invasive mosquito *Aedes albopictus* breeds in water-holding containers where it often competes for food as larvae with the native *Aedes triseriatus*. Container food mainly consists of allochthonous detritus inputs of leaf litter and associated microbes. We tested the hypothesis that litter grown in CO_2 concentrations representing worst-case but increasingly likely conditions predicted by IPCC climate-change scenarios affects competition among *A. albopictus* and *A. triseriatus*. Competition among *Ae. albopictus* and *A. triseriatus* was tested in microcosms with litter grown under elevated (~1000-ppm) or ambient (~385-ppm) CO_2 in a response-surface design. Population parameters for *A. albopictus* and *A. triseriatus* were also tested in single-species microcosms with varying amounts of elevated-CO_2 or ambient-CO_2 litter or commercial tannic acid. We found elevated-CO_2 litter had greater biomass and higher carbon levels than ambient-CO_2 litter but no differences in mosquito competition between litter types with *A. albopictus* consistently superior to *A. triseriatus*. Single-species microcosms with elevated-CO_2 litter had higher tannin concentrations and lower larval survival and slower larval development than microcosms with ambient-CO_2 litter, but there were no differences between *A. albopictus* and *A. triseriatus* in these population parameters. *Aedes albopictus* and *A. triseriatus* also experienced lower survival and slower development with increasing commercial tannic acid concentration. These results suggest that possible future CO_2 conditions may actually suppress mosquito production by increasing the toxicity of leaf litter.

2. **Isolation mechanisms of two genetically distinct groups of the parasitoid *Cotesia congregata* (Hymenoptera: Braconidae).** Justin P Bredlau, Virginia Commonwealth University, Dept. of Biology, 1000 W Cary St, Richmond, VA 23284; Karen M Kester, Virginia Commonwealth University, Dept. of Biology, 1000 W Cary St, Richmond, VA 23284. Insect parasitoids display rapid speciation through formation of host races that may be associated with chemically diverse host plants. Investigations of host-associated differentiation of parasitoids have largely focused on the degree of molecular genetic differentiation, but a true test of species status must examine the mating patterns of differentiated populations to determine if they are capable of interbreeding in the wild and producing viable offspring. We examined possible mechanisms of genetic isolation between two genetically distinct (2% divergence in the mtDNA COI locus) host-plant complex taxa of the parasitoid, *Cotesia congregata* (Hymenoptera: Braconidae) originating from *Manduca sexta* on tobacco and *Ceratomia catalpae* on catalpa. We compared male responses to female pheromones, elements of male courtship signals, and established reciprocal crosses and control lines to determine mating success within and between the two host-plant complex sources. All matings produced female offspring but one hybrid cross type had reduced mating success, and parasitized caterpillars of F1 hybrids from this hybrid cross consistently escaped parasitism, creating post-zygotic isolation. Larval development time, brood size, and sex ratios within and between the wasp groups also differed. Pheromone assays indicate that males respond to pheromones of both female types and analyses of male courtship song structure showed only subtle differences, suggesting that factors other than courtship behavior may lead to pre-zygotic isolation of the two host-plant complex groups.

3. **Wetland detritus effects on survival and development of the northern house mosquito (*Culex pipiens*).** Brandon Scott, University of Maryland, Dept. of Environmental Sciences and Technology,

College Park, MD 20742; Paul Leisnham, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20742; Andrew Baldwin, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20742. Invasive species have numerous impacts on ecological and human populations, including altering predominant food resources and spreading disease. Plant detritus and associated microorganisms are important food for mosquito larvae in temporary wetlands and can affect production of vector adults. Exotic plants can affect available resources by altering vegetation communities of these systems but few studies addressed the effects of invasive and native detritus on wetland mosquito production. The Eurasian emergent plant *Phragmites australis* has rapidly invaded freshwater wetlands along the eastern US, displacing numerous resident plants species. We tested the effect of different wetland plant detritus on the population performance of West Nile vector *Culex pipiens* in laboratory microcosms, comparing *P. australis* with common native species *Typha latifolia* and *Juncus effuse* as well as another common detritus input, mowed grass (*Festuca arundinacea*). We also established a size-fecundity relationship of *Cx. pipiens* to use in calculations of overall population performance. We found *Cx. pipiens* raised on grass produced the largest adults in the fastest time, but few larvae reached adulthood regardless of density. Larvae raised in *Juncus effuse* were the smallest at adulthood, and had the longest development time among all detritus types at high densities. There was little difference in population performance of *Cx. pipiens* raised on *P. australis* and *T. latifolia*. Our results suggest that the displacement of native plants through the invasion of *P. australis* may affect the production of *Cx. pipiens* in wetlands and disease risk by altering the affects of crowding or having variable toxicity impacts

4. **Mosquito vector ecology along a socioeconomic gradient in residential Washington, D.C.** Zara R Dowling, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20740; Peter Armbruster, Georgetown University, Washington, D.C.; Shannon LaDeau, Cary Institute for Ecosystem Studies; Millbrook, NY; Paul Leisnham, University of Maryland, Dept. of Environmental Sciences and Technology, College Park, MD 20740. Mosquitoes are nuisance species, and can present heightened disease risk in cities, which often serve as entry points for novel diseases and display high host density. Mosquito control efforts by public agencies typically focus on larviciding catch basins or aerial spraying for adults, but truly effective control requires active habitat reduction by residents on private property. Resident control practices are likely to vary with residents knowledge and attitudes regarding mosquitoes, which may vary with socioeconomic status. We tested the hypothesis that residents of varying socioeconomic backgrounds have different knowledge, attitudes and prevention practices regarding mosquitoes, and that these affect household production of vector species. We coupled Knowledge, Attitude and Practice (KAP) surveys of residents with entomological surveys of their backyards in six neighborhoods in Washington, D.C. that varied in socioeconomic status. We found that artificial containers in residential backyards produced an average of over 80 mosquito larvae per household. The most commonly collected mosquitoes were the aggressive biter *Aedes albopictus* and the main West Nile vector *Culex pipiens*. Preliminary multivariate analyses show that socioeconomic background affects multiple aspects of household knowledge and attitudes towards mosquitoes and their control. Our results suggest that public education needs to be targeted to specific socioeconomic contexts to effectively reduce the risk of mosquito-borne disease.

5. **Bacterial symbionts associated with the salivary glands of the potato leafhopper, *Empoasca fabae*.** Bridget D DeLay, University of Maryland, Dept. of Entomology, 4136 Plant Sciences Building, College Park, MD 20742-4454; William O Lamp, University of Maryland, Dept. of Entomology, 4112 Plant Sciences Building, College Park, MD 20742-4454. Symbiotic bacteria have been reported in many species of Hemiptera, most notably in aphids. When associated with the midgut, they are known to provide essential amino acids that are lacking in the diet of their host. The role that salivary gland symbionts play in their host's biology is not well documented, although they are presumed to supply necessary salivary components to their host. In this study, the potato leafhopper, *Empoasca fabae*, was screened for salivary symbionts. *Baumannia cicadellinicola* was detected in the salivary glands and abdomen through polymerase chain reaction using primers specifically designed to detect the 16S rDNA of the symbiont. The 16S rDNA was sequenced to create a phylogenetic tree

comparing the symbiont present in the potato leafhopper to other known leafhopper symbionts. Potato leafhopper salivary glands were dissected, and total RNA was extracted using TriZol, before being constructed into a cDNA library. The transcriptome of the salivary glands of the potato leafhopper was sequenced using Roche-454 pyrosequencing technology, and was then assembled into contigs and analyzed for symbiont gene products to determine the potential role that they play in the production of salivary components. Knowledge of the role that salivary symbionts play in the production of salivary components in the potato leafhopper will allow for better understanding of the role of its saliva in causing injury to its numerous economic host plants.

6. **Attracting beneficial insects in apple orchard using cowpea as a cover crop.** Sunghoon Baek, West Virginia University, Division of Plant and Soil Science, Morgantown, WV 26505; Charles W Lewis, West Virginia University, Division of Plant and Soil Science, Morgantown, WV 26505; Yong-Lak Park, West Virginia University, Division of Plant and Soil Science, Morgantown, WV 26505. Cover crops can be used to reduce the amount of agricultural runoff and sometimes attract beneficial insects to cropping areas. The cowpea (*Vigna unguiculata*) has been known as a good cover crop in many agricultural systems. To test cowpea's attractiveness to beneficial insects in apple orchard, spatial studies were conducted in Morgantown and Kearneysville, WV. In each orchard, two areas were selected: one area with cowpea as a cover crop and the other without cowpea. A sticky trap was placed in each apple tree and insects caught on the traps were identified and counted once a week for five weeks. Geo-coordinates of each apple trees were obtained using differentially corrected global positioning system. The data were analyzed and mapped with geostatistics and geographic information system. The results of this study showed that beneficial insects were spatially aggregated in the area without cowpea just after seeding cowpea, but the beneficial insects moved and aggregated in the area with cowpea as cowpeas grew. The result indicates the potential of using cowpeas as a cover crop for attracting beneficial insect into the orchard. Keywords: cowpeas, cover crop, sustainable agriculture, apple orchard, SADIE

7. **Urbanization impacts adult caddisflies (Trichoptera) to reduce richness of in-stream, larval assemblages.** Robert F Smith, University of Maryland, Dept. of Entomology, 4112 Plant Sciences Building, College Park, MD 20742-4454; William O Lamp, University of Maryland, Dept. of Entomology, 4112 Plant Sciences Building, College Park, MD 20742-4454. Most species of stream insects have a life cycle that includes an aquatic, larval stage and a terrestrial, adult stage. Research in urban watersheds has focused on how human activities in and around streams lead to lower in-stream habitat and water quality that decrease survivorship of larval stages. Human activities can also decrease survival and reproduction of adults, resulting in the loss of species from the larval community. We surveyed adult and larval caddisfly (Trichoptera) assemblages at four urban and four rural headwater streams to 1) compare diversity between urban and rural streams and 2) to determine the importance of regional (dispersal driven) versus local (habitat driven) processes for the observed low diversity in the urban streams. Diversity was higher at the rural headwaters for both larvae and adults. Several species of adult caddisflies were found at urban streams where their larvae were absent. These species were from families of insects with larvae that are generally intolerant of pollution such as Limnephilidae, Uenoidae, and Rhyacophilidae. This suggests that poor local habitat and water quality prevented colonization. However, both larvae and adults of other species of caddisflies typical of rural headwaters were absent from some urban headwaters. Regional constraints on dispersal likely prevent these species from migrating to these urban sites, and the lack of potential colonizers may contribute to low larval diversity in urban streams.

8. **Characterizing spatial distribution pattern of squash bug (*Anasa tristis*, Coreidae: Hempitera) using multiple geostatistical methods.** Vimal Varghees, West Virginia University, Division of Plant and Soil Sciences, PO Box 6108, Morgantown, WV 26505; Yong-Lak Park, West Virginia University, Division of Plant and Soil Sciences, PO Box 6108, Morgantown, WV 26505. The squash bug *Anasa tristis* (DeGeer) (Hemiptera: Coriedae), an important sap-sucking pest of cucurbit crops, is capable of transmitting bacteria (*Serratia marcescens*) that cause cucurbit yellow vine disease. Non-chemical control of *A. tristis* in cucurbit crops is almost impossible without knowing their population dispersal from overwintering sites and within-field population dynamics. Population ecologists have used

various techniques to characterize the spatial patterns of the population with the help of Taylor's power law Green's index, and Iwao's patchiness index. These methods can be used to develop sampling plans to reduce sampling efforts and increase sampling precision. However, these methods do not consider actual position of samples. For the last 20 years, entomologists have used more spatially explicit techniques to quantify the spatial autocorrelation of insect populations, such as SADIE (Spatial analysis of distance indices) and geostatistics. Understanding the spatial dispersion of insect population is essential for developing valid management measures. In this study, we characterized within-field spatial distribution pattern of squash bugs using geostatistics, SADIE and geographic information system. This information can be used for site specific pest management of squash bugs in the field.

9. **Pesticide adjuvants and inert ingredients may impair foraging behavior in honey bees (*Apis mellifera*).** Timothy J Ciarlo, Penn State University, Dept. of Entomology, State College, PA 16803; Christopher A Mullin, Penn State University, Dept. of Entomology, 512 ASI Building, University Park, PA 16802; James L Frazier, Penn State University, Dept. of Entomology, 518 ASI Building, University Park, PA 16802. Honey bees are exposed to a wide array of agricultural pesticides as they make their foraging trips from flower to flower. Dozens of pesticides and metabolites have recently been detected in samples taken from managed hives across the United States. Pesticide formulations contain the active ingredient(s) as well as other ingredients known as 'inert' ingredients, which often account for well over 50% of the product. Adjuvants are separate products that can be tank-mixed with a pesticide formulation to boost its efficacy by facilitating penetration of the pest's cuticle, increasing spreading on the leaf surface, etc. To date, toxicological tests involving honey bees and pesticides have focused almost entirely on active ingredients. Both inert ingredients and adjuvants are largely assumed to be harmless. Here we present preliminary data which suggest that Silwet L-77, a widely used organosilicone adjuvant, may have unforeseen negative effects on foraging behavior. Proboscis extension reflex (PER) assays were used to measure learning in bees that had been fed Silwet L-77 at concentrations likely to be encountered in the field. It was found that Silwet L-77 significantly reduced learning ability. Our findings illustrate the potential sub-lethal hazards of inert ingredients and adjuvants to honey bees, highlighting the need for more thorough toxicological testing. Impairment of learning in foragers may reduce the efficiency of foraging trips, thereby reducing the overall performance of a given hive. This could have important implications in the ongoing investigation of Colony Collapse Disorder.

10. **Wild bee diversity in Brooklyn, NY community gardens.** Mohammed T Al-Sayegh, 155 E. 31st St.; Apt.# 19B; Manhattan, NY 10016; Timothy W Leslie, 1 University Plaza; 801M; Brooklyn, NY 11210. The loss and fragmentation of habitat due to urbanization are major contributors to biodiversity loss. Wild bees and other pollinators have a key role in maintaining the diversity of ecosystems, yet relatively few studies have examined wild bee communities in core urban areas. Here, we measured bee diversity in community gardens throughout Brooklyn, NY – the most heavily populated borough in New York City. To identify the limiting factors of bee diversity in these urban areas, we examined both local (garden-specific) and landscape environmental factors at and around each site. Regression analyses and ordination techniques were used to identify which environmental factors were most influential in shaping bee communities. In total, 825 bees, representing 40 species were collected over two field seasons. Species richness was low compared to studies done in rural or suburban locations. Bee diversity in community gardens was primarily influenced by local factors, specifically floral diversity, garden size, and amount of sunlight. Differences in species groupings among the gardens were explained by the availability of specific food or nesting resources. This study highlights the importance of maintaining green space in core urban areas to support biodiversity and pollination services. The lack of landscape-level effects suggests that the dispersal capabilities of bees may allow them to persist in a highly fragmented landscape. As a result, gardeners have the opportunity to modify the floral and structural components of their gardens to attract a higher number and diversity of wild bees.

11. **Effects of host plant (Horsenettle; *Solanum carolinense* L) genetic diversity and inbreeding on feeding preference and oviposition behavior of specialist herbivore (Tobacco hornworm;**

***Manduca sexta* L).** Rupesh Kariyat, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Sarah Scanlon, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Ryan Moraski, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Christopher Balogh, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Consuelo M De Moraes, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Mark C Mescher, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Andrew G Stephenson, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802. Horsenettle (*Solanum carolinense* L., Solanaceae) is an agriculturally important herbaceous perennial weed found throughout the United States. Previous studies have suggested that inbreeding decreases plant fitness, resistance to herbivory, and the production of volatile organic compounds (VOC's; Delphia et al., 2008, 2009; Mena-Ali et al., 2008). This study investigates if the differences in the volatile blend produced by different maternal families and their inbred and outbred progenies of Horsenettle can cause differences in the feeding preference and oviposition behavior of the specialist herbivore Tobacco hornworm; *Manduca sexta*. To address this, we performed a series of choice tests using leaf discs from damaged and undamaged, inbred and outbred plants from three maternal families with early second instar caterpillars. We found that the caterpillars prefer undamaged discs over damaged discs and they also prefer inbreds over outbreds. To see the oviposition behavior, we plan to release mated female *Manduca* moths at night to see if they can selectively choose between damaged and undamaged, inbred and outbred Horsenettle plants.

12. **Resistance in Colorado potato beetles, *Leptinotarsa decemlineata* (Say), to spinosyn insecticides in Suffolk County, NY - A comparison of organic and traditional fields.** Kathleen Schnaars Uvino, Queens College, Dept. of Biology, Graduate Center, 6530 Kissena Blvd, Flushing, NY 11367; Mitchell Baker, Queens College, Dept. of Biology, 6530 Kissena Blvd, Flushing, NY 11367. Organic growers in Suffolk County (eastern Long Island, NY) are permitted up to three sprays with spinosyn insecticide per season, and several conventional growers treat with spinosyns later in the season following in-furrow imidacloprid treatment. A lack of effective control with spinosyn insecticides of Colorado potato beetles has been reported occasionally by both organic and conventional growers in Suffolk County in recent years. In 2009 a total lack of control was reported by two organic potato growers in eastern Suffolk Co. In 2010 samples from these two locations and from proximal and distant organic and conventional farms were analyzed for resistance to spinosyn as well as imidacloprid. Spinosyn resistance in the two organic farms is significantly higher than that found in earlier years samples from conventional farms. Comparisons with other organic and conventional farms will be reported.

13. **Contributions of nighttime predation and crop genotypic diversity to pest suppression.** Ian M Grettenberger, Penn State University, Dept. of Entomology, 101 Merkle Building, University Park, PA 16802; John F Tooker, Penn State University, Dept. of Entomology, 113 Merkle Building, University Park, PA 16802. The soybean aphid, *Aphis glycines*, is the foremost pest of soybeans across the Midwestern and Northeastern United States, often causing economic losses and necessitating insecticide use. At times, natural enemies are able to provide substantial control of soybean aphid, but the factors influencing the abundance and diversity of natural enemies in soybean fields are still not well understood. Studies in natural systems and our preliminary data suggest that plant genetic diversity can play a large role in structuring insect communities. We are exploring the potential of crop genotypic diversity for enhancing natural enemy communities in crop fields. To understand the influence of genetic diversity on natural enemy populations in soybeans, we conducted a large field experiment with genetically simple and genetically diverse plots. Within these plots, we characterized the community of potential soybean-aphid predators and partitioned their roles further by using exclusion cages to differentiate between day and night time predation and by sampling at night to capture ground-dwelling predators that forage in the foliage at night. Our results appear to indicate that increasing crop genetic diversity holds promise as an insect pest management strategy and that nighttime predation can help suppress pests.

14. **Does miticide exposure affect honey bee pheromone production?** Daniel Schmehl, Penn State University, Dept. of Entomology, 1 Chemical Ecology Building, University Park, PA 16802; Christina Grozinger, Penn State University, Dept. of Entomology, 4a Chemical Ecology Building, University Park, PA 16802; James Tumlinson, Penn State University, Dept. of Entomology, 111 Chemical Ecology Building, University Park, PA 16802. Honey bees (*Apis mellifera* L.) are frequently exposed to the miticides coumaphos and tau-fluvalinate, commonly used for varroa mite control, in the hive. These miticide residues are slow to break down and persist within the hive for several years. The sub-lethal impact of coumaphos and tau-fluvalinate on honey bee health is unclear. In our study, we examined the role of these two miticides on queen pheromone composition and production. The queen pheromone blend is critical for proper worker honey bee behavior and colony dynamics. In this experiment, the queen mandibular glands were dissected for each treatment and analyzed using GC-FID/GC-MS analysis. In addition, we analyzed the cuticular hydrocarbon profiles in the queens to determine possible changes in contact pheromone cues. Lastly, we performed a retinue response bioassay to determine changes in worker attraction to the queen for each of our treatments. Determining whether miticides are playing a role in the variation of queen pheromone composition and production will aid us in furthering our understanding of the role of miticides on colony dynamics and their impact on worker honey bee health.

15. **An assessment of thrips (Thysanoptera: Thripidae) spatial positioning in soybean.** Jessica A Samler, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437; David A Herbert, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437; David Owens, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437; Sean Malone, Virginia Tech, Dept. of Entomology, Tidewater AREC, Suffolk, VA 23437. No abstract submitted.

16. **Detection and characterization of *Culex flavivirus* transmission in Zambian *Culex quinquefasciatus* mosquitoes.** Paul L Maurizio, 615 N. Wolfe St.; E3402; Baltimore, MD 21205, Douglas E Norris, 615 N. Wolfe St.; E3628; Baltimore, MD 21205. *Culex quinquefasciatus* Say mosquitoes are important vectors of *Wuchereria bancrofti*, a predominant causal agent of lymphatic filariasis (LF). LF is the fourth leading cause of permanent disability globally, with approximately 1.3 billion people at risk of infection. Mosquito-only viruses could be utilized to modulate vector capacity and/or refractoriness to pathogens via paratransgenic mosquito control. In 2007, a paper was published by Hoshino et al. reporting a novel *Culex* flavivirus (CxFV), from the “insect-only” flavivirus group isolated in Japan and Indonesia. Zambian *Culex* flaviviruses have not yet been published, and arbovirus presence in Zambia is not well-established in the literature. From April through October 2010, indoor and outdoor CDC light traps, human landing catches, and household aspirations were conducted in Zambia in order to ascertain sex-specific virus prevalence and vertical transmission dynamics. Six CDC light traps were set in Macha, Zambia over 16 trap-nights during a 7-week period. Also, CDC light trap and HLC mosquito collections were performed in over 25 villages surrounding Macha. Transovarial transmission of CxFV was examined by collecting blood fed females and rearing offspring in the insectary at the Malaria Institute at Macha. Objectives of this study include examination of CxFV infection rate among male and female mosquitoes and determination of vertical transmission rates of CxFV from female parent to offspring in order to explore virus-mediated options for vector and parasite control of LF in Africa.

17. **How the fitness of male Aedes albopictus (Culicidae:Diptera) can be effected by sugar availability.** Alexandra Villiard, 180 Jones Ave; New Brunswick, NJ 08901, Randy Gaugler, 180 Jones Ave; New Brunswick, NJ 08901. No abstract submitted.

APPENDIX B

Submitted Poster Abstracts

18. Andropolymorphism in *Eucheyletia* near *bishoppi* (Acari : Trombidiformes : Cheyletidae).
Norman J. Fashing, College of William and Mary, Dept. of Biology, Williamsburg, VA 23187-8795; Kathryn Born, PO Box 200663; Arlington, TX 76006. Although andropolymorphism (= male polymorphism) is not common in mites, it has been observed in each of the major orders (Mesostigmata, Trombidiformes, and Sarcoptiformes). It is usually characterized by discrete morphological differences that separate males into two distinct forms. Polymorphism resulting from allometric growth, that is growth of one body part relative to another body part in which there is a change in relationships of proportions and/or shape, is quite rare. To our knowledge it has been reported for only one species of mite, Eutogenes vicinus (Cheyletidae), the males of which demonstrate allometric growth of the gnathosoma. The present paper describes allometric andropolymorphism in a second species of cheyletid mite, Eucheyletia near bishoppi, an inhabitant of nests of the mountain beaver (Aplodontia rufa) in Oregon, USA. In this species the ratio of pedipalpal length to idiosomal length for individual males ranges from 0.43 to 0.93, and the ratio of gnathosomal length to idiosomal length ranges from 0.65 to 1.23. The biological reason for this variation has not been determined.

APPENDIX C

Student Competition, Oral Presentation Abstracts

1:00 **Scarabaeoidea (Coleoptera) of Eastern Maryland.** Ryan E Johnston, Salisbury University, Dept. of Biological Sciences, 1101 Camden Avenue, Salisbury, MD 21801; Dana L Price, Salisbury University, Dept. of Biological Sciences, 1101 Camden Avenue, Salisbury, MD 21801. The superfamily Scarabaeoidea (Coleoptera) is a large, diverse, and globally distributed group of beetles. Worldwide there are 35,000 species comprising 10% of all known beetles. They have been reported as significant biocontrol agents, agricultural pests, and habitat indicators. This research is the first biodiversity inventory of Maryland's Scarabaeoid beetles. On a larger scale, all of Maryland's 23 counties will be sampled with a primary focus on the eastern shore. Here we examine the species diversity of "Scarabs" collected in Wicomico and Worchester Counties. Several collection methods have been implemented including baited pitfall traps, black lighting, aerial malaise traps, pheromone traps, and hand collection. Specimens have been curated for museum preparation and species identifications are in progress. To date approximately 85 species have been collected.

1:12 **Interaction between *Beauveria bassiana* GHA and entomopathogenic nematodes for control of *Cyclocephala* spp. (Coleoptera: Scarabaeidae).** Shaohui Wu, Virginia Tech, Dept. of Entomology, 301B Price Hall, Blacksburg, VA 24061; Roger R Youngman, Virginia Tech, Dept. of Entomology, 308 Price Hall, Blacksburg, VA 24061, Loke T Kok, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061, William R Kuhn, Virginia Tech, Dept. of Entomology, 209 Price Hall, Blacksburg, VA 24061, Curt A Laub, Virginia Tech, Dept. of Entomology, 308 Price Hall; Dept. of Entomology, Blacksburg, VA 24061. Masked chafer grubs, *Cyclocephala* spp. (Coleoptera: Scarabaeidae) are the most widespread and destructive turf pests in VA. Although conventional insecticides are still the main approach for white grub control, their impact on the environment, natural enemies, and the problem of insecticide resistance, have increased public awareness for a more biorational approach to managing white grubs. Several species of entomopathogenic nematodes and entomopathogenic fungi appear to be good alternatives to conventional insecticides, and additive or synergistic effects might be achieved if more than one agent is applied. This experiment addressed how a white fungus, *Beauveria bassiana* strain GHA, interacted with entomopathogenic nematodes, *Heterorhabditis bacteriophora* or *H. megidis* against 3rd-instar masked chafer grubs under laboratory and greenhouse conditions.

1:24 **Feeding in a full house: Can adaptive foraging and diversity tell us anything about how the invasive species *Sirex noctilio*'s populations will behave in North America?** Brian M Thompson, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg, College Park, Maryland 20742; Daniel S Gruner, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg,; College Park, Maryland 20742. Invasive species, *Sirex noctilo*, foraging, natural enemies, canonical correspondence analysis, The invasive woodwasp, *Sirex noctilio*, evolved in a species rich pine community in its native European, N. African, Asian range, but has been introduced to multiple locations in the Southern Hemisphere that lack rich species communities adapted to pine ecosystems. In the Southern Hemisphere, *Sirex* has become a major pest of pine species. The recent introduction to North America, begs the question. Will *Sirex* be a problem here, where communities are rich? We examined the potential interactions of *Sirex* with native North American species from data collected on red pines in Tioga County, PA, using canonical correspondence analysis on community data from experimental manipulations of *Sirex* attack on pines in a paired design. Our results indicate a significant attraction at the whole community level (p=.005) and within the mycetophagous guild (p=.01) to trees oviposited on by *Sirex*, but not for parasitoid or predatory guilds. Analysis of individual species responses revealed a surprisingly rapid and specific response from the mycetophagous/opportunistically predatory cerambycid beetle *Xylotrechus colonus*. These results suggest a role for interaction across seemingly disparate trophic levels in a diverse community due to what may be optimal

foraging of a rare forest resource (dying trees). *Sirex* does not feed on dead trees, but does kill trees, so interactions with native species that rapidly co-colonize and potentially change colonized resources, such as by introduction of fungi are important considerations in addition to natural enemies when considering 'pest' potential.

1:36 **Wasting eggs with self-superparasitism: The effects of host species and host diet.** Christina M Harris, Penn State University, Dept. of Entomology, 120 Chemical Ecology Lab, Orchard Road, University Park, PA 16802; James H Tumlinson, Penn State University, Dept. of Entomology, 113 Chemical Ecology Lab, Orchard Road, University Park, PA 16802. *Cotesia marginiventris* (Hymenoptera: Braconidae) is a solitary generalist parasitoid of Noctuid larvae. Host suitability for *C. marginiventris* varies among caterpillar species and host-plant diet. Self-superparasitism occurs when one female lays multiple eggs in the same host, and should be selected against in most instances because only one wasp can develop per caterpillar host. Here, we report self-superparasitism of *C. marginiventris* in a sub-optimal host species and examine the effects of host-plant diet on *C. marginiventris* emergence success.

1:48 **Sub-lethal doses of herbicide can increase susceptibility to aphid populations**. Eric Bohnenblust, Penn State University, Dept. of Entomology, 101 Merkle Buidling Orchard Rd, University Park, PA 16802; John Tooker, Penn State University, Dept. of Entomology, 101 Merkle Building Orchard Rd, University Park, PA 16802. Weed management tactics play an important role in shaping plant communities in agroecosystems, but the influence of herbicides on plant-insect interactions remains unclear. In response to the increasingly common development of glyphosate resistant weeds, agricultural industry is planning to release soybeans resistant to dicamba, a vapor-drift-prone herbicide that could have substantial non-target effects. To understand the risk posed by dicamba drift to arthropod communities, we conducted experiments simulating dicamba drift events into adjacent susceptible soybean fields. Field and greenhouse studies were established in 2009 and 2010 to evaluate aphid and natural enemy response to plants stressed by a range of dicamba doses (0, 0.0056, 0.056, 0.56, 5.6, 56.1 and 177.4 g/ha). In the field plants dosed with 0.56 g/ha of dicamba experienced the highest level of aphid exposure in 2009, while in 2010 aphid exposure was greatest on plants dosed with 0.056 g/ha. Soybean yield in 2009, and biomass in 2010 was similar in the drift level dose treatments (< 5.6 g/ha) despite higher aphid pressure. In the greenhouse, aphid populations developed best on plants dosed with 0.0056 g/ha, and 0.056 g/ha in 2009 and 2010, respectively. Plant biomass reduction in 2009 on plants treated with drift level doses was only 12-18% despite the increased aphid exposure. We are also exploring similar experiments with other herbivores. Our results suggest that drift-level doses of dicamba have the potential to alter herbivore populations, and care should be taken to ensure that herbicide drift is minimized to avoid exacerbating pest problems.

2:00 **Functional and numerical response of *Laricobius* spp. predators (Coleoptera: Derodontidae) on hemlock woolly adelgid, *Adelges tsugae* (Hemiptera: Adelgidae)**. Ligia C Vieira, Virginia Tech, Dept. of Entomology, 311 Price Hall, Blacksburg, VA 24061; Scott M Salom, Virginia Tech, Dept. of Entomology, 210 Price Hall, Blacksburg, VA 24061; Loke T Kok, Virginia Tech, Dept. of Entomology, 216A Price Hall, Blacksburg, 24061. Functional and numerical responses of *Laricobius osakensis* Montgomery and Shiyake and *L. nigrinus* Fender to its prey, *Adelges tsugae* Annand, were assessed in the laboratory. The feeding response (number of ovisacs disturbed) of males and females of both species, was best described by a Type II functional response. The overall attack rate (a) and handling time (Th) of *L. osakensis* were 0.013 and 3.64, respectively. For *L. nigrinus*, attack rate was 0.019 and handling time differed significantly for males (4.33) and females (3.63). Attack rate and handling time for females of both species did not differ significantly, but *L. nigrinus* males had both a higher attack rate and higher handling time than *L. osakensis*. The number of eggs laid by *L. osakensis* and *L. nigrinus* females was taken as an approximation of the predators numerical response. The number of eggs (ne) laid by *L. osakensis* or *L. nigrinus* females as a function of *A. tsugae* density (d) was modeled by the equations: log(ne) = 1,51 + 0,28*log(d) and ne = 2,53 + 0,22*d -

0,005*(d-18)^2, respectively. *L. osakensis* females laid significantly more eggs than *L. nigrinus* females across all densities. Females of both species laid eggs in several locations within the *A. tsugae* ovisac but *L. osakensis* also laid eggs outside ovisacs, on the bark. *L. osakensis* preferred to lay the eggs under the adelgid while *L. nigrinus* prefer to lay the eggs in the wool. The higher numerical response of *L. osakensis* indicate this predator is potentially more effective.

2:12 **Assessing *Eucryptorrhynchus brandti* as a potential carrier for *Verticillium albo-atrum* from infected *Ailanthus altissima*.** Amy L Snyder, Virginia Tech, Dept. of Entomology, Blacksburg, VA, 24061; Scott M Salom, Virginia Tech, Dept. of Entomology, Blacksburg, VA, 24061; Loke T Kok, Virginia Tech; Dept. of Entomology, Blacksburg, VA, 24061; Gary J Griffin, Virginia Tech, Dept. of Plant Pathology, Blacksburg, VA, 24061; Donald D Davis, Penn State University; Dept. of Plant Pathology, University Park, PA. Two potential biological control agents for the invasive tree of heaven (TOH), *Ailanthus altissima* (Miller) Swingle have been extensively studied: a native vascular wilt fungus, *Verticillium albo-atrum* Reinke & Berthold, and a host-specific weevil herbivore from China, *Eucryptorrhynchus brandti* (Harold) (Coleoptera: Curculionidae). In 2002 *V. albo-atrum* was observed in Pennsylvania causing significant mortality to TOH; however, one limitation of this agent is its natural spread from tree to tree appears to be restricted. A limited survey conducted in western Virginia in 2009 revealed two sites where TOH stands were infected with *V. albo-atrum*. The purpose of our research is to determine if *E. brandti* can successfully carry and transmit *V. albo-atrum* to TOH. Studies include possible dissemination factors: feeding and tibial transmission, fecal transmission, and transmission by newly emerged weevils from infested TOH bolts. Results of these will be presented.

2:24 **Effect of two semiochemical attractants on *Frankliniella* spp. thrips.** Heather E Andrews, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Thomas P Kuhar, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061;; Doug Pfeiffer, Virginia Tech, Dept. of Entomology, 205C Price Hall, Blacksburg, VA 24061; Ames Herbert, Virginia Tech, Dept. of Entomology, Tidewater AREC, 6321 Holland Rd., Suffolk, VA 23437; Pete Schultz, Virginia Tech, Dept. of Entomology, Hampton Roads AREC, 1444 Diamond Springs Rd., Virginia Beach, VA 23455; Helene B Doughty, Virginia Tech, Dept. of Entomology, Hampton Roads AREC, 1444 Diamond Springs Rd., Virginia Beach, VA 23455. Two different semiochemical lures, a synthetically produced western flower thrips pheromone (Syngenta Bioline) and Chemtica P-178 floral kairomone (AgBio Inc.) were evaluated for their ability to enhance the catch of *Frankliniella* thrips on yellow sticky cards in several different habitats in eastern Virginia. Each experiment was a completely randomized design with each lure and an unbaited control replicated five times per location. In 2009 the eight different locations included: a tomato and potato field in Painter, VA, a cotton and peanut field in Suffolk, VA, and grassy areas bordering commercial greenhouses and within the greenhouses in Virginia Beach and Chesapeake, VA. In 2010 identical trials were carried out at all sites excluding the cotton and peanut fields. Thrips sampling began in May and extended through the middle of June. Sticky cards were collected and replaced two times per week and placed in plastic wrap. A pan trap was located within the center of each plot, and samples were collected, identified and used to establish a species complex at each site. Data were analyzed using a negative binomial generalized linear model adjusted for multiple comparisons with the control using Dunnett-Hsu procedure. In general, the floral kairomone attractant caught significantly more flower thrips than the other treatments at all of the sites. Neither lure appeared to have an attractant effect on *F. fusca*. Based on the results, the floral kairomone lure enhances catches of some flower dwelling thrips, while the pheromone lure does not appear to greatly increase thrips catches.

2:36 **Effects of Cucumber mosaic virus infection on plant chemistry and vector behavior.** Kerry E Mauck, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802; Consuelo M De Moraes, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802; Mark C Mescher, Penn State University, Dept. of Entomology, 501 ASI Building, University Park, PA 16802. The transmission dynamics of insect-vectored diseases are determined by complex interactions among parasites, hosts, and vectors. But while

many of these interactions are mediated by chemical cues and signals, there has been little work to date on the chemical ecology of insect-vectored diseases, especially in plants. In this study, we examined the chemical mediation of interactions among a widespread plant pathogen, the non-persistently transmitted Cucumber mosaic virus (CMV), its commonly infected host plants, and aphid vectors. Our results indicate that CMV infection reduces host plant quality for aphids and that aphids rapidly disperse from infected plants. Yet, individuals of both aphid species were nevertheless attracted to the elevated volatile emissions of infected plants. These results suggest that CMV induces a plant phenotype conducive to its non-persistent mode of transmission and different from that previously reported for plant viruses that require more sustained aphid feeding for transmission. Chemical analysis of infected and healthy plants documented several key differences in plant hormones and amino acid levels contributing to this phenotype. Infected plants exhibited reduced levels of amino acids in the phloem, including several essential amino acids and others needed for synthesis of essential amino acids by bacterial symbionts. Additionally, we detected elevated levels of polyunsaturated C-18 fatty acids, ethylene, and the defense hormone, jasmonic acid. Taken together, our findings suggest that CMV induces changes in host plants that are conducive to vector transmission and, more generally, that the transmission mode may play an important role in shaping pathogen-induced changes in host phenotypes.

2:48 **Interactions between *Lygus* bugs and *Erigeron annuus*: Applications toward a trap crop system for the tarnished plant bug.** Sean T Halloran, Penn State University, Dept. of Entomology, 118 Chemical Ecology Lab,; University Park, PA 16802; James H Tumlinson, Penn State University, Dept. of Entomology, 111 Chemical Ecology Lab, University Park, PA 16802. Generalist and Hemipteran insects are both understudied in terms of their chemical ecology even though many Hemipterans are major insect pests in agricultural ecosystems. A greater understanding of chemical cues that mediate interactions among host plants, Hemipterans, and their natural enemies would benefit control efforts. A common field edge weed, *Erigeron annuus*, is remarkably attractive to the tarnished plant bug, *Lygus lineolaris* (Hemiptera: Miridae), which is a highly damaging pest on multiple crops. These attractive cues function over long distances and result in both attraction and arrestment of *L. lineolaris*. However, the mechanism of this attraction is currently unknown. Understanding the mechanisms by which *E. annuus* attracts and arrests *L. lineolaris* would facilitate use of *Erigeron* to direct the movements of *Lygus* in the field. To understand how *E. annuus* is attractive, we explored the blend of volatile organic compounds emitted by the plants with and without the presence of *Lygus* bugs. Volatile collections from *E. annuus* demonstrate that this species produces a highly complex volatile blend consisting of over 60 distinct compounds at amounts far greater than co-occurring crop hosts of *L. lineolaris*. Furthermore, when fed upon by *Lygus*, novel compounds are induced and constitutive compounds up-regulated. These results, along with behavioral observations, indicate that *L. lineolaris* will preferentially visit and aggregate on this weedy host. *Erigeron* may therefore be useful to concentrate *Lygus* into a small area – adjacent to or separate from crops – that could then be subject to application of chemical or biological controls.

3:00 Break

3:12 **Chemical ecology of *Philornis downsi* (Diptera: Muscidae): An invasive avian parasite of the Galapagos Islands.** Robert M Collignon, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, 1 Forestry Dr, 150 Illick, Syracuse, NY 13210; Stephen A Teale, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, 1 Forestry Dr; 151 Illick; Syracuse, NY 13210. The parasitic fly *Philornis downsi* is the greatest threat to the avifauna of the Galapagos Islands. Thus far, the development of methods to control this invasive, haematophagous ectoparasite has been unsuccessful. Chemical samples were taken from male and female *P. downsi* and tested in olfactometer bioassays and GC-EAD to screen for potential attractants. We tested (1) cuticular hydrocarbons in solvent body washes, (2) volatile compounds collected by aeration on an adsorbent filter, and (3) activated cuticular hydrocarbons also collected by aeration on an

adsorbent filter. There is significant sexual dimorphism in the cuticular hydrocarbon profiles. Initially, olfactometer bioassays produced positive results, but these were not replicable in later tests. Activated samples collected with solid phase micro-extraction (SPME) contained compounds that elicited GC-EAD responses from females. GC-EAD tests have also indicated a number of biologically active compounds in male and female cuticular extracts.

3:24 **Assessing susceptibility of three Hymenoptera parasitoids of emerald ash borer to the entomopathogenic fungi *Beauveria bassiana*.** Kimberly M Dean, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Syracuse , NY 13210; Melissa K Fierke, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, 1 Forestry Drive; Syracuse, NY 13210; John D Vandenberg, USDA-ARS, Robert W. Holley Center, Room 324, Tower Road, Cornell University, Ithaca, NY 14853. Emerald ash borer, *Agrilus planipennis* Fairmaire, an invasive wood-boring beetle, is killing ash trees (*Fraxinus* spp.) across 13 states and SE Canada. Integrated pest management using biological control appears to be the only viable long-term approach for controlling the spread of EAB. Three hymenopteran parasitoids of EAB, *Spathius agrili*, *Tetrastichus planipennisi*, and *Oobius agrili* have been approved for release in the United States. The objective of this study was to assess susceptibility of parasitoids to *Beauveria bassiana*, an entomopathogenic fungi proven to infect and kill EAB adults when applied as a pre-emergent trunk spray. Adult EAB and parasitoids were exposed to *B. bassiana* inoculated ash twigs for 2 - 4 hours and then observed for death and signs of infection for up to 11 days. All EAB adults exposed to *B. bassiana* were fatally infected, showing signs of internal infection. Average percent mortality in the treatment groups for *Tetrastichus* and *Spathius* were 3.5% and 16.5%, respectively. Data for *Oobius* was inconclusive. Unregulated laboratory conditions and high sensitivity of *Oobius* to temperature and light resulted in 100% mortality in the control group and 90% in the treatment group. This research elucidates interactions between two potential biocontrol agents, providing data integral to developing a successful multi-stage approach to control of EAB.

3:36 **Analysis of gut contents to determine the effect of flowering plants and alternative prey on predation by *Orius insidiosus* (Say) on European corn borer eggs.** Matthew W Bickerton, Rutgers University, Dept. of Entomology, 93 Lipman Drive, New Brunswick, NJ 08901; Rong Di, Rutgers University, Dept. of Plant Science, Biotech Center, 59 Dudley Rd., New Brunswick, NJ 08901; George C Hamilton, Rutgers University, Dept. of Entomology, 93 Lipman Drive, New Brunswick, NJ 08901. The use of companion plantings to attract predators of the European corn borer, *Ostrinia nubilalis* Hübner (ECB) in bell peppers show that populations of the generalist, *Orius insidiosus* Say may be increased by more than 200% compared with conventional plantings. However, there are many factors that will influence the actual predation rates by *Orius* on ECB in the field. In particular, it is not known whether intercropped herbs which have been planted to attract and sustain populations of predatory insects will have an effect on predation rates. In addition, populations of alternative pests like the Green Peach Aphid, *Myzus persicae* Sulzer (GPA) have an effect on predation rates of generalist predators in the field, and have been shown to discourage ECB egg predation by *Orius* in the lab. Therefore, a PCR-based assay has been developed to detect European corn borer Cytochrome Oxidase subunit I (COI) DNA in the gut of *Orius insidiosus*. Primers have also been selected to detect GPA DNA, as well as DNA found in the pollen of some of the intercropped plants. This study seeks to shed light on the behavior of a generalist predator in response to alternative food availability and the overall efficacy of a conservation biological control program in reducing damage by the European corn borer. Results of this study will be presented at this meeting.

3:48 **Determination of risk factors associated with the infestation of Virginia vineyards by larvae of the grape root borer (Lepidoptera: Sesiidae).** Jhalendra P Rijal, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Carlyle C Brewster, Virginia Tech, Dept. of Entomology, 202 Price Hall, Blacksbrug, VA 24061; James C Bergh, Virginia Tech, Dept. of Entomology, 595 Laurel Grove Road; Winchester, VA 22602. Grape root borer, Vitacea

polistiformis (Harris), is an oligophagous, endemic pest of grapevines in portions of the eastern United States. Larvae are known to feed on the roots of wild grape species and commercially important *Vitis* species and rootstocks, posing a potentially significant risk to the health and productivity of many vineyards. However on-going, season-long surveys of the abundance of grape root borer pupal exuviae have revealed that infestation status varies widely both among commercial vineyards and among blocks within vineyards in Virginia. Neither the proximate nor ultimate risk factors underlying this variation is known, although a number of biotic and abiotic factors are likely involved. The objectives of this research are, 1) to quantify the important risk factors for grape root borer infestation, 2) to quantify the autocorrelation between pupal exuviae counts with distance and direction within sampled vineyard blocks, 3) develop interpolated maps using semivariogram models and, 4) to ultimately develop a logistic regression model of grape root borer infestation in relation to vineyard factors. Infestation status will be assessed by collecting the pupal exuviae from sampled vines in 40 to 50 vineyard blocks over a five year period. The factors under consideration include variety, rootstock, vine age, proximity to wild grapes, soil texture and soil moisture

4:00 **Investigating factors in host plant selection of harlequin bug (*Murgantia histrionica*) (Hahn).** Anna K Wallingford, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Thomas P Kuhar, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061; Peter B Schultz, Virginia Tech, Dept. of Entomology, 1444 Diamond Spring Rd., Hampton Roads AREC; Virginia Beach, VA 23455. Harlequin bug (*Murgantia histrionica*)(Hahn) is a pest of cole crops and trap cropping is a potential method for its management. Knowledge of host plant preference will aid in better implentation of this management method.

4:12 **Using macroinvertebrates to determine ecological function of agricultural drainage ditches.** Alan W Leslie, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg, College Park, MD 20742; William O Lamp, University of Maryland, Dept. of Entomology, 4112 Plant Science Bldg, College Park, MD 20742. Agricultural drainage ditches are man-made structures designed to speed the removal of water from agricultural fields and have been co-opted for improving the quality of water draining from agricultural lands. Drainage ditches also provide seasonal habitat to a wide range of aquatic plants and animals. We sampled benthic macroinvertebrates and physical and chemical parameters from agricultural drainage ditches to determine relationships between community structure and environmental variables related to nutrient processing within ditches. Aquatic invertebrates and chemical data were collected from a total of 29 ditches on the Eastern Shore of Maryland. Multivariate ordination analysis was used to find how the benthic invertebrate community correlates with physical and chemical habitat measures within the ditches. The results of this study show that composition and abundance of benthic macroinvertebrate communities change along environmental gradients related to management of ditches for water quality.

4:24 **Effects of white-tailed deer browsing on insect diversity in the Alleghany hardwood forests.** Laura A Wheatall, Indiana University of Pennsylvania, 101 Art Crest Drive, Butler, PA 16001; Tim Nuttle, Indiana University of Pennsylvania, 114 Weyandt Hall, Indiana, PA 15705; Ellen Yerger, Indiana University of Pennsylvania, 114 Weyandt Hall; Indiana, PA 15701. Elevated densities of white-tailed deer, *Odocoileus virginianus*, have induced direct and indirect changes in hardwood forest ecosystems by over-browsing. Direct influences include changes in plant composition, diversity, and density, but indirect effects of these changes, especially on phytophagous insects, are not well understood. To investigate how deer density affects vegetation, from 1979-1990, deer density was manipulated in large (13-26 ha) enclosures in NW Pennsylvania and ultimately resulted in significant changes in overstory tree composition and diversity in 2010. We investigated how these deer effects on vegetation cascade to phytophagous insects, particularly caterpillars (larval Lepidoptera). In 2010, we sampled caterpillars from 960 branch tips of the eight most dominant tree species using a pole-mounted tree pruner and collection bag. All caterpillars were collected, counted, and identified either morphologically or with DNA barcoding. Leaves from each branch were removed, dried and

weighed and caterpillar density was standardized to number per kg leaf mass. In total, 660 caterpillars were collected and tree species significantly (P = 0.0001) differed in mean caterpillar density. There were significantly more caterpillars on *P. pensylvanica* compared to the other tree species. Additionally, 91 different caterpillar [update to reflect only caterpillars] species were identified on these tree species and *P. pensylvanica* had the highest caterpillar species diversity. Because *P pensylvanica* had both the highest density and diversity of caterpillars and is most negatively impacted by deer overbrowsing, elevated densities of white-tailed deer may scale up to lower caterpillar abundance and diversity at the landscape scale.

4:36 **Effects of genetic diversity and inbreeding on plant-insect interactions in horsenettle (*Solanum carolinense* L).** Rupesh Kariyat, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802; Kerry Mauck, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Consuelo m De Moraes, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Mark C Mescher, Penn State University, Dept. of Entomology, 555 ASI, State College, PA 16802; Andrew G Stephenson, Penn State University, Dept. of Biology, 208 Mueller Lab, State College, PA 16802. Horsenettle (*Solanum carolinense* L., Solanaceae) is an agriculturally important herbaceous perennial weed found throughout the United States. Previous studies have suggested that inbreeding decreases plant fitness, resistance to herbivory, and the production of volatile organic compounds (VOC's; Casey et al., 2008; Jorge et al., 2008). This study investigates variation in the diversity of herbivores and parasitoids on horsenettle based on their genotypes (inbred and outbred) and herbivore damage (no damage Vs tobacco hornworm; *Manduca sexta*) damage. Damaged and undamaged, inbred and outbred plants from three maternal families were placed in cages in an agricultural field, and a sample of the insects attracted to these plants were collected on three different traps. Our data suggest that damaged plants attract significantly higher number of hymenoptera, diptera and coleoptera insects. We also found that damaged outbred plants and undamaged inbred plants attract significantly more flea beetles with a family X breeding X damage effect. To address the speculation that the variation in the attractiveness is mainly due to the differences in the production of VOC's and phytohormone levels, we collected VOC's and phytohormones from these treatments and our data indicate that damaged outbred plants produce significantly higher amount of VOC's (total volatiles and volatile blend) and the major phytohormones with a family X breeding X damage effect.

4:48 **Quantifying emergence phenology of the exotic *Sirex noctilio* F. and the native siricid-parasitoid complex in New York.** Christopher R Standley, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210; Dylan Parry, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210; Melissa K Fierke, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210. The invasive woodwasp, *Sirex noctilio*, has had devastating impacts on commercial pine plantations wherever it has been introduced in the southern hemisphere. Since its first detection in North America 5 years ago, it has been found in four states and two Canadian provinces. To develop phenological models for *S. noctilio*, native siricids, and their parasitoids, nine 0.5-meter bolts were removed from 30 red pine (*P. resinosa*) and Scot's pine (*P. sylvestris*) from 2 sites in central and western New York. Insects were allowed to emerge in rearing tubes in an outdoor insectary at ambient environmental conditions. Overall, 391 *Sirex noctilio* emerged along with 246 native siricids and 216 parasitoids. Phenologies indicate *S. noctilio* and the native siricids minimally overlap in their emergence while some parasitoids are emerging during the same period as the introduced woodwasp. Our results provide novel insights into this complex and set the stage for further research into how our native community is responding to increased numbers of *S. noctilio*.

5:00 **A comparison of Lepidopteran community composition, diversity and stand characteristics in high and low ash (*Fraxinus* spp.) density stands in New York.** Peter J Rockermann, SUNY College of Environmental Science and Forestry, Dept. of Environmental and

Forest Biology, Illick Hall, 1 Forestry Drive; Syracuse, NY 13210, Melissa K Fierke, SUNY College of Environmental Science and Forestry, Dept. of Environmental and Forest Biology, Illick Hall, 1 Forestry Drive, Syracuse, NY 13210. The invasion of North America by the Emerald Ash Borer (EAB), *Agrilus planipennis*, has devastated ash (*Fraxinus* spp.), especially in areas where the beetle has been established for multiple years. In southeastern Michigan, for example, ash mortality approaches 100%. Such mortality fundamentally changes stand structure and undoubtedly has severe consequences for ash dependent species. There are at least 20 such species of ash specialists Lepidoptera in the Northeast. Unfortunately, the severity and rapidity of ash mortality has precluded appropriate biodiversity studies in the most heavily infested regions. Until very recently, New York State has been free of EAB infestation and thus offers opportunities to study Lepidopteran communities within ash stands prior to the arrival of this exotic insect and consequent loss of ash. We focused on moths as they are well described and relatively easy to identify. In 2010, we conducted a study in seven stands in wetland and upland habitats in New York. Moths were sampled using paired blacklight box traps in adjacent high and low ash density stands over three periods; spring, summer, and late summer. Statistical comparisons of moth community compositions and stand characteristics were made among sites. This study will serve as an important benchmark with which to assess the impact of EAB or potentially restore damaged ecosystems in the future.

5:12 **Origins of *Synsphyronus* diversity in a global biodiversity hotspot.** Roberta Engel, Univ. of Connecticut, 75 N. Eagleville Road, Unit 3043, Storrs, CT 06269-3043; Mark S. Harvey, Western Australian Museum, Dept. of Terrestrial Invertebrates, Welshpool DC, Western Australia, AUS 6986; Elizabeth Jockusch, Univ. of Connecticut, 75 N. Eagleville Road, Unit 3043, Storrs, CT 06269-3043. Southwestern Australia has been designated a global biodiversity hotspot by Conservation International. Biologists seek to understand how these hotspots became rich in species and two processes have been inferred, speciation in situ and colonization from surrounding regions. A distinctive feature of southwestern Australia is a system of granite outcrops which harbors a unique biota. Our research focuses on the pseudoscorpion fauna that is restricted to this terrestrial archipelago. Prior to our work, only one described species, *Synsphyronus elegans*, had been recorded from the outcrops and it was known only from its type locality. *Synsphyronus* Chamberlin (Garypidae:Pseudoscorpiones) is a genus found throughout Australia, New Zealand, and New Caledonia. The genus comprises 28 described species, 26 in Australia and 2 in New Zealand. We have sampled over 100 outcrops, collecting six morphotypes based on key taxonomic characters, trichobothrial pattern and tarsal number. Molecular data was collected from these and other species. Evolutionary relationships between outcrop and non-outcrop lineages were inferred using four nuclear markers (elongation factor 1-α, actin 5C, internal transcribed spacer regions, and wingless). Based on the species level phylogenies, we identified three major clades, all of which are represented in the outcrop fauna. In addition, some groups have speciated within the outcrops. Our findings provide evidence that the high diversity of *Synsphyronus* in southwestern Australia results from both in situ speciation and multiple colonization events.

5:24 **Management of Colorado potato beetle (*Leptinotarsa decemlineata* Say) with tolfenpyrad.** Adam F Wimer, Virginia Tech, Dept. of Entomology, Eastern Shore AREC, 33446 Research Dr; Painter, VA 23420; Thomas P Kuhar, Virginia Tech, Dept. of Entomology, 216 Price Hall, Blacksburg, VA 24061. Colorado potato beetle (CPB), *Leptinotarsus decemlineata* Say, is one of the most important insect pests of potato, *Solanum tuberosum* L., in North America and Europe. In Virginia, CPB adults and larvae can cause a tremendous amount of defoliation and yield loss if crops are untreated. In the spring and summer of 2010, lab toxicity trials and a field trial were conducted to evaluate a novel broad spectrum compound, tolfenpyrad, for the management of CPB. Tolfenpyrad toxicity tests were conducted on small larvae and adult beetles to determine the LC50 values for this new product. Leaf dip and contact bioassays were conducted evaluating 5 concentrations of tolfenpyrad and a water treatment. Leaf dip bioassays evaluated the effects of tolfenpyrad on 40 larvae and 20 adults per concentration. Results for the leaf dip bioassays conducted on CPB larvae and adults had mean LC50 values of 137,000

mg/kg and 869,950 mg/kg of active ingredient, respectively. Results from the contact bioassays yielded an LC50 value of 2,102,950 mg/kg of ai. A field trial was setup in a randomized complete block design to evaluate three field rates of tolfenpyrad for the management of CPB. Ten potato stems were evaluated per plot counting the number of small and large larvae per stem. Results from the field trial indicated significant control of CPB larvae at rates as low as 0.154 kg ai/ha. Tolfenpyrad is a novel broad spectrum insecticide that has shown excellent control of CPB in both lab toxicity trials as well as in the field.

5:36 **Effects of insectivorous birds on arthropod communities, primary productivity, and plant architecture in mangrove forests**. Alexander J Forde, University of Maryland, Dept. of Entomology, College Park, MD 20742; Ilka C Feller, Smithsonian Environmental Research Center, Edgewater, MD 21037; John D Parker, Smithsonian Environmental Research Center, Edgewater, MD 21037; Daniel S Gruner, University of Maryland, Dept. of Entomology, College Park, MD 20742. Mangrove forests provide critical ecological and economic services and are threatened by anthropogenic factors. Therefore, it is important to understand the interactions that affect foundation species in these ecosystems. Resource limitation can regulate the growth of mangrove trees, but damage by arthropod herbivores can also constrain mangrove primary productivity. Predatory birds are capable of reducing arthropod densities and indirectly increasing plant growth as a result, but their effects on mangrove food webs have not been studied. To quantify the impact of birds on mangroves and associated arthropods, we excluded birds from *Rhizophora* mangle (red mangrove) canopies on two islands off the coast of Belize. We constructed 1m3 PVC frames around entire small, slow-growing trees (situated in nutrient-poor areas) and around individual branches of large, fast-growing trees (situated near nutrient-rich areas). Half of these frames (N=20) were covered with propylene netting to exclude birds, while the other half were left as controls. We searched for arthropods, recorded levels of herbivory, and measured branches on each tree 0, 10, 20, and 33 weeks after treatments were applied. In the absence of birds, arthropods increased in abundance on both fast and slow growing trees, and damage to apical buds caused by caterpillars (*Ecdytolopha* sp.) also increased for both tree types. However, mangrove productivity was not affected by bird presence or herbivory. Considering our observation that bud damage increases branching on fast-growing mangroves, we conclude that birds likely alter the architecture but not the biomass of mangrove trees by decreasing insect herbivory.

APPENDIX D

Submitted Oral Presentation Abstracts

2:58 Control of dogwood borer with mating disruption using an antagonistic sex pheromone. Arthur Agnello, Dept. of Entomology, Cornell University, NYS Agric. Expt. Sta., 630 W. North St., Geneva, NY 14456; David Kain, Dept. of Entomology, Cornell University, NYS Agric. Expt. Sta., 630 W. North St., Geneva, NY 14456. The increase in the acreage of apple trees grown on dwarfing rootstocks, which have a tendency to form burrknots, has led to an increase in problems with the dogwood borer, which infests rootstocks through these burrknots. One insecticide, chlorpyrifos, controls both overwintered larvae and the summer brood with one application. However, chlorpyrifos is under increasing scrutiny by regulatory authorities, prompting an ongoing search for alternatives. In addition, growers are reluctant to apply sprays to control borers because, to be effective, sprays must be applied with a handgun applicator which entails considerable labor and potential for worker exposure. One possible alternative to using insecticides to control dogwood borer is mating disruption. An experiment to determine the efficacy of mating disruption using an antagonistic pheromone, Isomate LPTB, was begun in 2008 and repeated in 2009 and 2010. In all years, nearly 100% trap shutdown occurred in the treated orchards. We also examined burrknots in subplots within those orchards, which were compared with samples in untreated orchards, to determine whether there was any effect on larval infestation in the treated orchards. While differences in burrknot infestation by DWB larvae were not always statistically significant, infestation was apparently reduced by about 50% in treated orchards in 2008. In 2009-10, infestation was significantly reduced in each treated orchard by approximately 70–90%.

3:10 Commercial orchard study comparing organic materials to conventional tools for pear psylla management. Peter J Jentsch, Dept. of Entomology, Cornell University, 3357 Route 9W, Highland, NY 12528. Pear production in NYS is managed on nearly 2000 acres, with yearly crop yields producing roughly 16,500 tons valued at 3.85 million dollars. In the Hudson Valley region, pears comprise about 800 acres (USDA, 2005). The principle pests of pear production in the Northeastern US are pear psylla, *Cacopsylla pyricola* (Foerster), and Fabraea leaf spot, *Fabraea maculata* causing premature defoliation, reduced fruit size, quality and yield, followed by premature decline and eventual death of the tree depending on variety. Insecticide resistance has resulted in lower levels of efficacy, reducing effectiveness of current pest management strategies. Recent studies conducted at Cornell University's Hudson Valley Laboratory have demonstrated excellent control of the pear psylla using newly developed OMRI products. Surround WP and highly refined horticultural oils (HRO's) were used successfully in pre-bloom and season long insect management programs to maintain psylla populations below economic thresholds. Furthermore, we observed applications of HRO's suppressing Fabraea leaf spotting, leading to reductions in defoliation to untreated pear trees. Seasonal use of HRO's for Northeast pear management beyond the pre-bloom stage has yet to be adopted in commercial orchards. This study, conducted in a commercial Hudson Valley pear orchard in Milton, NY augmented the use of commercial pest management tools using these two OMRI products for pear psylla management to achieve commercial levels of fruit quality. Air induction nozzles were compared to hollow disk nozzles to study the effects of off target drift with speed and spray volumes as additional variables across commercial and experimental treatments.

Entomological Society of America Eastern Branch
2010-2011 Committees

The Entomological Society of America Eastern Branch depends on volunteers to perform the critical functions that keep our Branch active and productive. Without the participation of members in the executive, standing, and ad hoc committees we would be unable to provide quality programming for our annual meeting. The next annual meeting is scheduled for March 18 - 21, 2011 at the Harrisburg Hilton, Harrisburg, PA. If you're considering volunteering a portion of your time for committee service this year, please contact either the current chair of the committee in which you're interested or this year's Secretary, Mr. Dan Gilrein, or Eastern Branch President, Dr. Harvey Reissig.

On behalf of the entire Eastern Branch membership, please accept my thanks for your willingness to serve - Dan Gilrein.

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