

ENTOMOLOGICAL SOCIETY OF AMERICA EASTERN BRANCH

79th ANNUAL MEETING
March 9-11, 2008
Holiday Inn Syracuse/Liverpool
Liverpool, NY



P.A. Weston 2008

THE CHANGING LANDSCAPE OF ENTOMOLOGY

The Program Encapsulated – 2008

SUNDAY

Morning	Executive Committee Meeting	9:00-12:00	Boardroom 2
Afternoon	Registration	12:00-5:00	Ballroom Foyer
	Local Arrangements	12:00-5:00	Headquarters Room
	It's a Bug's World – Outreach	1:00-5:00	Grand Ballroom
	Posters and Displays	1:00-9:00	Cotillion – North
	Student Oral Presentation Competition	12:00-5:00	Cotillion – South
Evening	ESA President's Address to the Members	5:30-6:00	Cotillion – North
	President's Reception	6:00-7:30	Cotillion – North
	IDEP Workshop	7:30-9:00	Cotillion – North
	Student Networking	7:30-9:00	Boardroom 2
	Linnaean Games	9:00	TBA

MONDAY

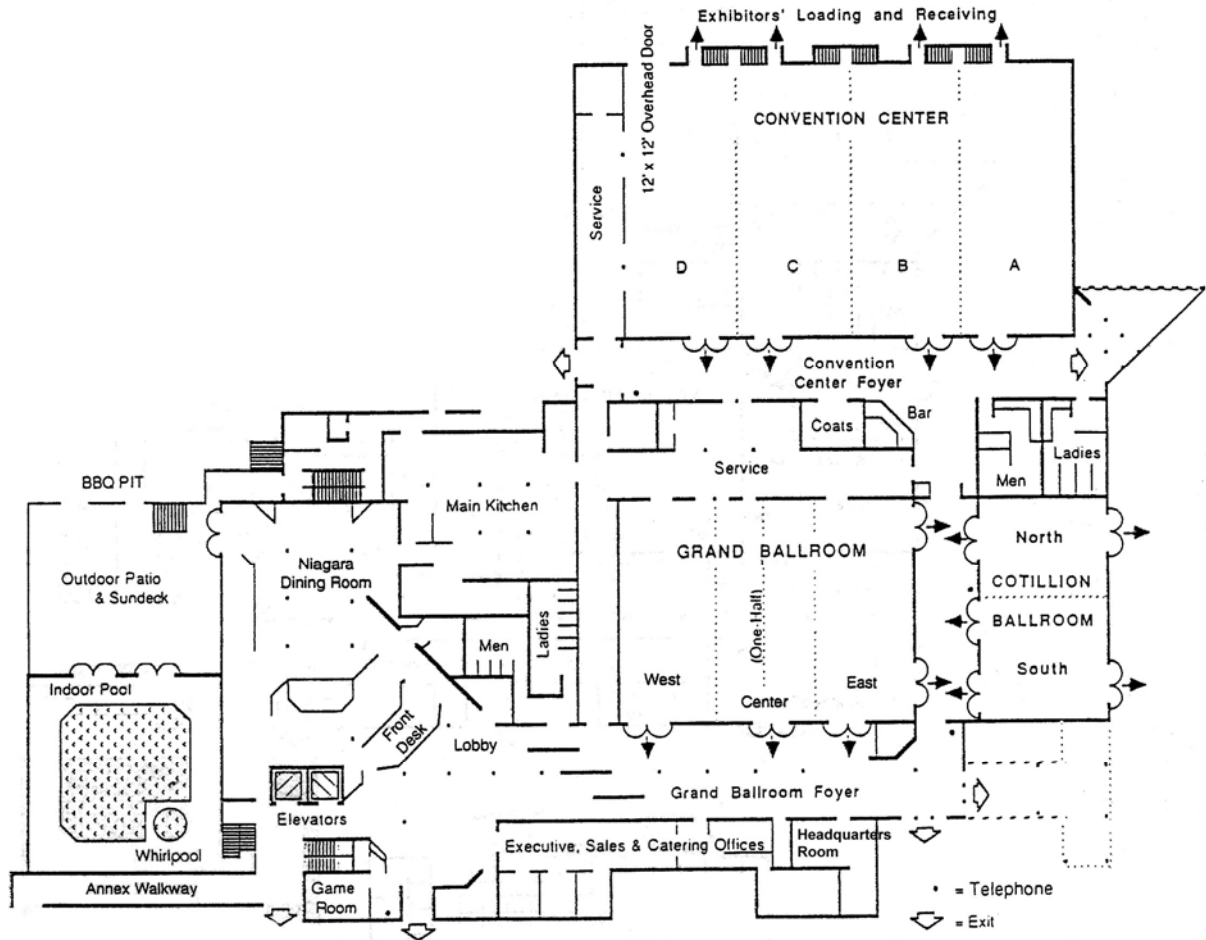
Morning	Registration	8:00-5:00	Ballroom Foyer
	Local Arrangements	8am-9pm	Headquarters Room
	Posters and Displays	8:00-5:00	Cotillion – North
	IDEP Symposium	8:00-11:50	Ballroom – West
	Hot Topics Symposium	8:30-11:40	Ballroom – Center
	Industry Symposium	8:00-11:15	Ballroom – East
	Swallow-wort biocontrol working group	9:00-12:00	Boardroom 4
Afternoon	Ornamentals Symposium	1:00-5:30	Ballroom – West
	Student-sponsored Symposium	1:00-4:20	Ballroom – Center
	Vegetable Symposium	1:00-5:00	Ballroom – East
Evening	Social and cash bar	5:30-6:00	Ballroom Foyer
	Banquet and awards	6:00-8:30	Ballroom

TUESDAY

Morning	Registration	8:00-10:00	Ballroom Foyer
	Local Arrangements	8:00-12:00	Headquarters Room
	Eastern Branch Business Meeting	7:00-7:45	Ballroom – East
	Posters and Displays	8:00-12:00	Cotillion – North
	Fruit Entomology	8:00-12:00	Ballroom – West
	Insect Imaging Symposium	8:30-11:30	Ballroom – Center
	Submitted Paper Presentations	8:00-11:48	Ballroom – East
	Adjourn	12:00	

Holiday Inn Floor Plan

FIRST FLOOR



SECOND FLOOR

Boardrooms 1-4 are located on the second floor. To get to the boardrooms, take the stairs or elevator by the front desk to the second floor. Once on the second floor, turn left, proceed down the hallway, and then take a left at the next hallway intersection. The boardrooms will be on your right (across the hall from the fitness rooms).

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2008 Eastern Branch ESA Award Winners

ESA Achievement Award in Teaching



Dr. Linda S. Rayor received her undergraduate degree at the University of Colorado-Boulder in 1978. She received her Ph.D. in behavioral ecology at the University of Kansas – Lawrence in 1987. After postdoctoral research at the University of Cincinnati and the University of Arizona, she joined the Department of Entomology at Cornell University in 1994. Dr. Rayor teaches Spider Biology, Insect Behavior, and Naturalist Outreach Practicum, as well as spider courses for Cornell's Adult University. Dr. Rayor has previously been awarded the 2007 Innovative Teacher Award and the 2005 Kaplan Family Distinguished Faculty Fellow in Service Learning. Her research program is focused on a comparative study of the behavior, ecology and physiology of social and solitary Australian huntsman spider species to determine the benefits and costs associated with group living in cannibalistic spiders.

For ten years, Dr. Rayor has directed an outreach program in which Cornell undergraduates serve as a 'Speakers Bureau' to provide science-inquiry based ecological presentations in local 2nd – 12 classrooms and community groups. She and her students have given 920 talks, and reached over 34,000 people.

ESA Achievement Award in Extension



Dr. Michael J. Raupp is a Professor of Entomology in the Department of Entomology at the University of Maryland, College Park, Maryland. He holds advanced degrees from Rutgers University and the University of Maryland. His research interests focus on the mechanisms of plant resistance and biological control of insect pests of landscape plants. He works closely with the arborists, urban foresters, and the public to develop effective and environmentally acceptable methods of pest management. Mike is a past President of the Eastern Branch of ESA and has won numerous regional and national awards for his extension programs including the Secretary of Agriculture's Award for Environmental Protection.

Award for Excellence in Integrated Pest Management

(sponsored by Syngenta Crop Protection, Inc. and
the Entomological Foundation of ESA)



Dr. Scott Salom grew up on Long Island, New York. After high school, he went to the Midwest to study Forestry at Iowa State University. By the time he was a junior, he began to get interested in Forest Entomology and Pathology. With what was a difficult choice at the time he decided to focus on Entomology after receiving his B.S. and has enjoyed it immensely.

He arrived at Virginia Tech in 1989 as a post-doctoral Research Associate, and has moved up through the ranks, achieving his current rank of Professor in 2007. He has had the good fortune to work for wonderful mentors, with excellent colleagues, and mentor a terrific group of bright and energetic students, many of whom have gone on to make their own mark in this profession.

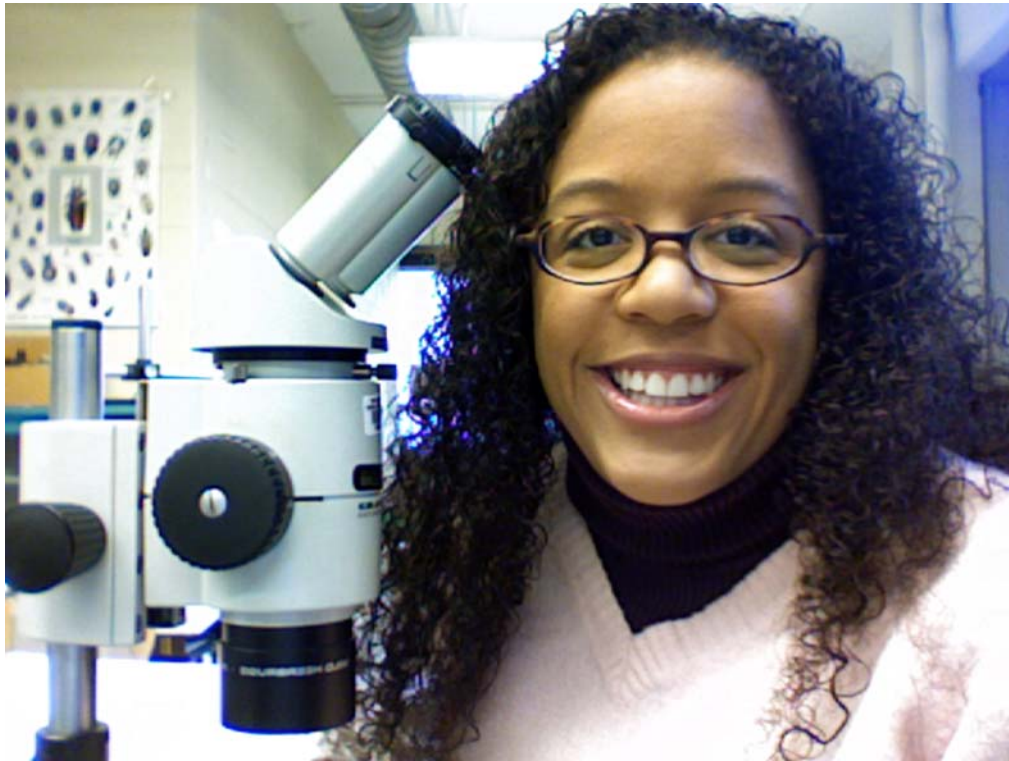
His program at Virginia Tech has focused on native insect pests of pine forests and invasive insect and weed pests of eastern U.S. forests. He is committed to the development of IPM tools and their implementation into forest management systems. He is also dedicated to making available valuable, yet difficult to access, information into formats and outlets that are both accessible and easy to use by forest resource managers and other professionals.

L.O. Howard Distinguished Achievement Award



Dr. Thomas (“Tom”) Henry is a systematist with the Systematic Entomology Laboratory (SEL), Agriculture Research Service, United States Department of Agriculture, housed at the National Museum of Natural History, Smithsonian Institution, Washington, DC. He curates one of the world’s largest Heteroptera collections housing nearly 2 million specimens in nearly 2,700 drawers. Tom received B.S. from Purdue University, his M.S. from the Pennsylvania State University, and his Ph.D. from the University of Maryland. He has been with SEL since 1980, where he has published three books, including the “Catalog of the Heteroptera, or true bugs, of Canada and continental United States,” 13 book chapters, and more than 160 scientific papers. Tom is considered an international authority on the plant bugs (Miridae) and stilt bugs (Berytidae) as well as other heteropterian families. Tom, a member of ESA since 1978 and regular participant at branch and national meetings, has served on the program committee, chaired and organized numerous symposia, and served on the editorial board of the *Annals*. He is a founding member of the International Heteropterists’ Society and serves on the editorial boards of several International Journals. He is currently one of five senior scientists to receive a five-year National Science Foundation “Planetary Biodiversity Inventory Grant” to monograph two subfamilies of Miridae.

John Henry Comstock Award



Jessica Ware attended the University of British Columbia in Vancouver, Canada where she received her B.Sc. While at UBC, she assisted Dr. Geoff Scudder and Karen Needham at the Spencer Entomological Museum. She worked with Dr. Diane Srivastava on *Mecistogaster modesta* (Odonata: Zygoptera: Pseudostigmatidae), both in Vancouver and northeastern Costa Rica. She also worked with Dr. Judy Myers on viruses in natural tent caterpillar populations and *Bacillus thuringiensis* resistance in greenhouse populations of *Trichoplusia ni*.

Jessica has been a graduate student at Rutgers University for four years, studying dragonfly systematics and evolution. Her work focuses on the superfamily Libelluloidea, which comprises Macromiidae, Corduliidae and the extremely speciose family, Libellulidae. She is currently working on molecular and morphological analyses to determine the evolution of several behavioral, and biogeographical characters within Libelluloidea. Jessica also studies convergent evolution, particularly in dragonfly wing venation patterns, which are influenced by flight behaviour. She is collaborating on several species level odonate systematics studies (e.g., *Stylogomphus*, *Synlestes*, and *Syncordulia*). In addition to dragonfly systematics, Jessica is interested in phylogenetic methodology. She has examined how phylogenetic hypotheses vary with ingroup and outgroup taxon selection in Dictyoptera, and investigated the effects of model selection on divergence estimation in dragonflies.

Asa Fitch Memorial Award



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 is currently a graduate student at the University of Maryland, and his interests include the systematics of Lepidoptera, molecular phylogenetics, and cultural entomology. For his Master's thesis, he specialized in the molecular phylogenetics of hawkmoths (Sphingidae), and the evolution of proboscis length in this family. He is currently a Ph.D. student studying the systematics of leaf-mining Gracillariidae, and is involved in the NSF-AToL Lepidoptera Tree-of-Life project.

Eastern Branch Herbert T. Streu Meritorious Service Award



Jim Steffel, Director of LAB Services in Harrisburg, PA, has been instrumental in organizing industry symposia at the annual Eastern Branch meetings for the past 12 years. Through his efforts, the Branch has benefitted from symposia such as, "New Chemistry & Technology for Pest Management," and "Biotechnology and Pest Management in the Northeast." As the corporate Support Coordinator for the Branch, Jim has raised funds to provide both scientific presentations and displays. Through his efforts, industry entomologists have had a voice in programing and governance in the Branch. Jim has been a tireless and reliable worker and the Branch appreciates his contributions.

SUNDAY MARCH 9, 2008

Sunday Morning

Executive Committee Meeting	<i>Boardroom 2</i>	9:00-12:00
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Sunday Afternoon

Registration Mark Taylor, Maryland Dept. of Agriculture	<i>Ballroom Foyer</i>	12:00-5:00
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Local Arrangements Carolyn Klass, Cornell University	<i>Headquarters Room</i>	12:00-5:00
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Public Outreach Program	<i>Grand Ballroom</i>	1:00-5:00
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“It’s a Bug’s World”

Organizer: Faith Kuehn, Delaware Department of Agriculture, Dover, DE

Thousands of bugs and insect enthusiasts will converge on the Holiday Inn’s Grand Ballroom for “It’s a Bug’s World”. This insect event for kids, parents and teachers, presented by the Eastern Branch of the ESA, is free to the public as well as to meeting registrants and their families. Kids can jump into the middle of a bug’s world with crafts and games, create their own insect, and determine which worm is in their apple by playing the Apple Game. Origami insects will spring to 3-D life following skillful paper folding by Yong-Lak Park of West Virginia U. The notorious artists who paint with their legs, Vincent Van “Roach”, Leonardo da “Hissi”, and Michelangelo Buonar “roachi”, will be showing off their art in motion, directed by Ronda Hamm of Cornell.

Displays include:

- Bees: honey bees, Cornell University
- And so many more bees: squash, digger, mason, green, carpenter, and bumble bees, Delaware Department of Agriculture
- Maggots by the bucket, Cornell Veterinary Entomology
- History on a Thread: Silk Culture, Caterpillar Catalyst
- Courtly Musicians and Backstreet Brawlers: Crickets in Asian Cultures
- Insect-eating Herps, Cornell University Herpetology Club
- Baltimore Woods Centers for Nature Education
- New York State Zoo at Thompson Park
- A menagerie of insects, Carrie Murray Nature Center
- Insect jewelry, face painting and more

Sunday Afternoon

Student Poster Competition*

Cotillion - North

1:00-7:30

***See appendix A for abstracts of posters from this section**

[Author attendance at posters during President's Reception, Sunday 6:00 – 7:30 p.m.]

Organizer: Brian A. Nault, Department of Entomology, Cornell University, New York State
Agricultural Experiment Station, Geneva, NY

1. **Applying Dyar's Law to the growth of *Sigara mathesoni* (Hungerford) (Heteroptera: Corixidae).** Dustin R. Shull, Gregory S. Paulson and Richard L. Stewart, Dept. of Biology, Shippensburg University, Shippensburg, PA
2. **Changes in nest dispersion of *Formica exsectoides* over a ten year period on South Mountain, PA.** Kevin Chase, Aaron Whitcomb, Betty Ferster and Gregory S. Paulson, Dept. of Biology, Shippensburg University, Shippensburg, PA
3. **Development of *Hypena opulenta* (Lepidoptera: Noctuidae) on two species of invasive swallow-worts.** Alison H. Traver, Aaron S. Weed and Richard A. Casagrande, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI
4. **Feeding preference of *Halymorpha halys* (Stål) in New Jersey crops: *Phaseolus vulgaris*, *Capsicum annum*, *Lycopersicon esculentum*, and *Glycine max*.** Andrea E. Wagner, Anne Nielson and George Hamilton, Dept. of Entomology, Rutgers University, New Brunswick, NJ
5. **Ovarian Development in *Halymorpha halys* (Hemiptera: Pentatomidae).** Zack F. Russo, Anne Nielsen and George Hamilton, Dept. of Entomology, Rutgers University, New Brunswick, NJ
6. **Fitness of cytochrome P450 monooxygenase-mediated permethrin resistance in the mosquito under three environmental conditions.** Melissa C. Hardstone, Brian P. Lazzaro and Jeffrey G Scott, Dept. of Entomology, Cornell University, Ithaca, NY
7. **Spatial distribution of *Laricobius nigrinus* and *Laricobius rubidus* within four HWA-infested hemlock stands.** Gina A. Davis, Scott M. Salom and Loke T. Kok, Dept. of Entomology, Virginia Tech, Blacksburg, VA
8. **Host-shifting potential in *Tetraopes tetraophthalmus* onto *Vincetoxicum* and related species.** Paul C. Sokoloff and Naomi Cappuccino, Dept. of Biology, Carleton University, Ottawa, ON
9. **Are you what you eat: Do polyphagous forest Lepidoptera exhibit host-associated genetic differentiation?** J. Gwen Shlichta and Pedro Barbosa, Dept. of Entomology, University of Maryland, College Park, MD

Sunday Afternoon

10. **The role of pollen in the transmission of viruses in the pollinator community.** Rajwinder Singh¹, Abby L. Kalkstein¹, Diana L. Cox-Foster¹, Edwin G. Rajotte¹, Dennis van Engelsdorp², Claude W dePamphilis³, Rick Donovall², Nancy Ostiguy¹, and Owen Thompson¹, (1) Dept. of Entomology, The Pennsylvania State University, University Park, PA; (2) Pennsylvania Department of Agriculture, Bureau of Plant Industry-Apiculture Section, Harrisburg, PA; (3) Department of Biology, The Pennsylvania State University, University Park, PA

 11. **Phylogenetic supermatrix analysis of obtectomeran Lepidoptera: Total evidence from 7 genes and 1796 species.** Akito Y. Kawahara¹, Adam Bazinet² and Michael P. Cummings², (1) Dept. of Entomology, University of Maryland, College Park, MD; (2) Center for Bioinformatics and Computational Biology, University of Maryland, College Park, MD
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Submitted Posters*

Cotillion - North

1:00-9:00

***See appendix B for abstracts of posters from this section**

[Author attendance at posters during President's Reception, Sunday 6:00 – 7:30 p.m.]

12. **The Effect of Methamphetamine on Decomposition of Carrion and Maggot Growth.** Monica Scarazzo, Dept. of Biology, Shippensburg University, Shippensburg, PA; Anne Michelson, Cumberland Co. Office of the District Attorney, Forensic Laboratory, Carlisle, PA; and Gregory S Paulson, Dept. of Biology, Shippensburg Univ., Shippensburg, PA

13. **RNA-editing and alternative exon usage in nicotinic acetylcholine subunits in *Tribolium castaneum*.** Frank D. Rinkevich and Jeffrey G. Scott, Department of Entomology, Cornell University, Ithaca, NY

14. **Constitutive activation of Phenobarbital-responsive pathway conferring overexpression of CYP6D1 in permethrin-resistant LPR strain of house fly.** George Guan-Hua Lin and Jeffrey G. Scott, Department of Entomology, Cornell University, Ithaca, NY

15. **Maturation feeding influences hydrocarbon profiles of *Monochamus scutellatus*.** Bekka S. Brodie, 32 Summer St, Orono, ME and Stephen A. Teale, Department of Environmental and Forest Biology, SUNY - College of Environmental Science and Forestry, Syracuse, NY

Sunday Afternoon

16. **Defining key grape volatiles used for host location as a basis for assessing phenology and management of grape berry moth.** Dong H. Cha and Greg Loeb, Department of Entomology, Cornell University, Geneva, NY; Satoshi Nojima, Department of Entomology, North Carolina State University, Raleigh, NC; and Wendell Roelofs and Charles Linn, Jr., Department of Entomology, Cornell University, Geneva, NY

17. **Ovicide and ovi-larvicide activity of Lannate® LV and other selected commercial insecticides on Western flower thrips, *Frankliniella occidentalis* (Thysanoptera: Thripidae) in the laboratory.** Mary Koechert and Robert M. Leighty, Stine Farm, Newark, DE

18. **Japanese beetle control and varietal comparisons in primocane-bearing caneberries.** Laura M. Maxey, Douglas G. Pfeiffer, Curt A. Laub, and Ryan S. Mays, Department of Entomology, Virginia Tech, Blacksburg, Virginia

19. **Pest resistance status of hybrid releases housed in USDA's 'core' *Malus* germplasm collection.** Clayton T. Myers, Appalachian Fruit Research Station, USDA-ARS, Kearneysville, WV and Philip L. Forsline, Plant Genetic Resources Unit; USDA-ARS, Geneva, NY

20. ***Pieris napi oleracea* adaptation to garlic mustard.** Ryan J. Vazquez, Richard A. Casagrande, and Lisa A. Tewksbury, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI

21. **Distribution of *Halyomorpha halys* (Stål)(Hemiptera: Pentatomidae) in the Mid-Atlantic States.** Amy Willmott, Anne L. Nielsen, and George C. Hamilton, Department of Entomology, Rutgers University, New Brunswick, NJ

22. **Development of *Eumolpus asclepiadeus* (Chrysomelidae) on two invasive swallow-worts (*Vincetoxicum* spp.).** Aaron S Weed and Richard A Casagrande, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI and André Gassmann, CABI Europe- Switzerland, Delémont, Switzerland

23. **Domestic arthropod survey of swallow-wort (*Vincetoxicum* spp.), invasive vines in North America.** Lindsey R. Milbrath and Jeromy Biazzo, USDA-ARS; U.S. Plant, Soil and Nutrition Laboratory, Ithaca, NY

24. **The Acarine Fauna of Trogid Beetles (Coleoptera: Trogidae).** James R Philips, Math/Science Division, Babson College, Babson Park, MA

Sunday Afternoon

25. **The Microarthropod Community Associated with Desert Biological Soil Crusts of the Colorado Plateau.** Scott A. Lewins, Thomas R. Weicht, and Deborah A. Neher, Department of Plant and Soil Sciences, University of Vermont, Burlington, VT
26. **Estimates of mating frequencies by queens in commercial populations of the honey bee, *Apis mellifera* L.** Nicholas W. Calderone, Department of Entomology, Cornell University, Ithaca, NY and Jamie P. Strange, USDA-ARS Pollinating Insect-Biology, Management, Systematics Research (Bee) Lab, Utah State Univ.; Logan, UT
27. **Translaminar Insecticidal Activity of DuPont™ Rynaxypyr™ (DPX-E2Y45).** James D. Barry, Don G. Clagg, Larry J. Watson, Molly E. Waddell, Robert F. Dietrich, and Paula C. Marçon. DuPont Crop Protection, Stine-Haskell Research Center, Newark DE 19714

Sunday Afternoon

Student Oral Presentation Competition*

Cotillion - South

12:00-5:00

*See appendix C for abstracts of talks for this session

Organizer and Moderator: Brian A. Nault, Department of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY

- 12:00 **Screening for resistance and impact of onion thrips (*Thrips tabaci* Lindeman) and Iris yellow spot virus on onion growth.** John Diaz-Montano¹, Anthony M. Shelton¹, Brian A. Nault¹ and Marc Fuchs², (1) Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY; (2) Dept. of Plant Pathology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY
- 12:12 **Are aphids stealthy, or are they manipulative?** Suppression of caterpillar-induced volatile emission in broad bean plants by the pea aphid, *Acyrtosiphon pisum*. Ezra G. Schwartzberg and James H. Tumlinson, Dept. of Entomology, Center for Chemical Ecology, The Pennsylvania State University, University Park, PA
- 12:24 **CANCELLED**
- 12:36 **Herbivory on invasive exotic plants.** Tania Jogesh and Naomi Cappuccino, Dept. of Biology, Carleton University, Ottawa, ON
- 12:48 **Leek moth life tables and field efficacy of a candidate biocontrol agent.** Wade H. Jenner¹, Ulrich Kuhlmann¹, Peter G. Mason² and Naomi Cappuccino³; (1) CABI Europe – Switzerland, Delémont, Switzerland; (2) Eastern Cereal and Oilseed Research Centre, Ottawa, ON; (3) Dept. of Biology, Carleton University, Ottawa, ON
- 1:00 **Forgotten paradise: Did the holarctic genus *Wockia* (Lepidoptera: Urodidae) originate in the Neotropics?** Jae-Cheon Sohn, Dept. of Entomology, University of Maryland, College Park, MD
- 1:12 **Bean leaf beetle economic injury level on early-stage snap beans.** Meredith E. Cassell¹, Thomas P. Kuhar¹, Peter B. Schultz² and Doug Pfeiffer³. (1) Dept. of Entomology, Eastern Shore Agricultural Research & Extension Center, Painter, VA; (2) Dept. of Entomology, Hampton Roads Agricultural Research & Extension Center, Virginia Tech, Virginia Beach, VA; (3) Dept. of Entomology, Virginia Tech, Blacksburg, VA

Sunday Afternoon

- 1:24 ***Loxosceles reclusa* envenomation: An examination of cytoskeletal restructuring, and the potential chemical reversal of the effects of the venom.** Rachel R. M. Dwyer and David A. Bell, Jr., Dept. of Biology, St. Vincent College, Latrobe PA
- 1:36 **BREAK**
- 1:48 **Assessing possible sources of onion thrips-transmitted Iris yellow spot virus in New York onion fields.** Erik A. Smith¹, Cynthia L. Hsu¹, Marc Fuchs², Anthony M. Shelton¹, Christine A. Hoepting³ and Brian A. Nault¹, (1) Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY; (2) Dept. of Plant Pathology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY; (3) Orleans County CCE, Cornell Vegetable Program, 12690 Rte. 31, Albion, NY
- 2:00 **Soil management effects on entomopathogenic fungi during the transition to organic agriculture.** Randa Jabbour¹, Andrew G. Hulting², Christina A. Mullen¹ and Mary E. Barbercheck¹, (1) Dept. of Entomology, The Pennsylvania State University, University Park, PA; (2) Oregon State University
- 2:12 **Oviposition by the fungus gnat *Bradysia impatiens* (Diptera: Sciaridae) on *Pythium* spp. infected geranium plants (*Pelargonium x hortorum*).** Sarah E. Arnold¹, Stephen P. Wraight², Eric B. Nelson³ and John P. Sanderson¹, (1) Dept. of Entomology, Cornell University, Ithaca, NY; (2) USDA-ARS, US Plant, Soil and Nutrition Laboratory, Ithaca, NY; (3) Dept. of Plant Pathology, Cornell University, Ithaca, NY
- 2:24 **Competition between Y^M and III^M males in the house fly, *Musca domestica* L.** Ronda L. Hamm and Jeffrey G. Scott, Dept. of Entomology, Cornell University, Ithaca, NY
- 2:36 **Enemy release and the invasiveness of exotic knapweeds.** David J. Carpenter and Naomi Cappuccino, Dept. of Biology, Carleton University, Ottawa, ON
- 2:48 **Comparison of aggregation traps using the attractant methyl (E,E,Z) 2,4,6 decatrienoate for *Halyomorpha halys* (Stal)(Hemiptera: Pentatomidae).** Anne L. Nielsen¹, Peter Shearer² and George C. Hamilton¹, (1) Dept. of Entomology, Rutgers University, New Brunswick, NJ; (2) Rutgers Agricultural Research & Extension Center, Bridgeton, NJ
- 3:00 **Beneficial and the beast: A test of the enemy release hypothesis.** Jane E. Allison¹, Peter Mason² and Naomi Cappuccino¹, (1) Dept. of Biology, Carleton University, Ottawa, ON; (2) Agriculture and Agri-Food Canada, Ottawa, ON

Sunday Afternoon

- 3:12 **Evaluating the impact of growth-promoting-rhizobacteria and natural enemies on *Myzus persicae* infestations in pepper.** Caroline B. Hunt and Brian A. Nault, Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY
- 3:24 **BREAK**
- 3:36 **The influence of native plants on arthropod population dynamics: Can native plants enhance conservation biological control?** Ellery Vodraska¹, Douglas Tallamy², Paula Shrewsbury¹ and Michael Raupp¹, (1) Dept. of Entomology, University of Maryland, College Park, MD; (2) Dept. of Entomology and Wildlife Ecology, University of Delaware, Newark, DE
- 3:48 **Evidence for female pheromones of the Asian longhorned beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae).** Jacob D. Wickham and Stephen A. Teale, Department of Environmental and Forest Biology, SUNY - College of Environmental Science and Forestry, Syracuse, NY
- 4:00 **Potential use of *Hypena opulenta* (Lepidoptera: Noctuidae) as a biocontrol agent of swallow-worts (*Vincetoxicum* spp.).** Aaron S. Weed and Richard A. Casagrande, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI
- 4:12 **Gill-plate ventilation kinematics and ontogenetic transitions in the nymphal mayfly *Centropilum triangulifer*.** Andrew T. Sensenig¹, Jeffrey W. Shultz¹ and Kenneth T. Kiger², (1) Dept. of Entomology, University of Maryland, College Park, MD; (2) Dept. of Mechanical Engineering, University of Maryland, College Park, MD
- 4:24 **Stimuli associated with aggregative oviposition of viburnum leaf beetle [*Pyrrhalta viburni* (Paykull)].** Gaylord A. Desurmont and Paul A. Weston, Dept. of Entomology, Cornell University, Ithaca, NY
- 4:36 **Age-dependent differences in humoral immune responses in gypsy moth larvae.** James McNeil, Diana Cox-Foster and Kelli Hoover, Dept. of Entomology, The Pennsylvania State University, University Park, PA
- 4:48 **Pierce's disease in Virginia: Survey of cicadellid vectors.** Anna Wallingford¹, Sue Tolin², Peter Sforza³ and Douglas Pfeiffer¹, (1) Dept. of Entomology, Virginia Tech, Blacksburg, VA; (2) Dept. of Plant Pathology, Virginia Tech, Blacksburg, VA; (3) Dept. of Geography, Virginia Tech, Blacksburg, VA
- 5:00 **Adjourn**

Sunday Evening

National ESA President's Address to the Branch Membership	<i>Cotillion - North</i>	5:30-6:00
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Michael Gray, ESA President

Plant-Insect Ecosystems Section President's Address to the Branch Membership

“Finding a Home in the Plant-Insect Ecosystems Section”

Rob Wiedenmann, President, PIE Section

EB ESA President's Reception	<i>Cotillion</i>	6:00-7:30
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Jim Lashomb, EB ESA President

Author's attendance at posters	<i>Cotillion - North</i>	6:00-7:30
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IDEP Workshop	<i>Cotillion - North</i>	7:30-9:00
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“Exotic Pest Show and Tell”

Organizers: Eric Day, Virginia Tech and Mark Taylor, MD Dept. of Agriculture

IDEP Committee Meeting	<i>TBA</i>	TBA
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Student Networking Social	<i>Boardroom 2</i>	7:30-9:00
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Organizer: Jim Lashomb, Eastern Branch President

Linnaean Games	<i>TBA</i>	9:00
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Organizer: Doug Pfeiffer, Moderator

MONDAY MARCH 10, 2008**Monday Morning**

Registration	<i>Ballroom Foyer</i>	8:00-5:00
Mark Taylor, Maryland Dept. of Agriculture		
Local Arrangements	<i>Headquarters Room</i>	8a.m.-9p.m.
Carolyn Klass, Cornell University		
Posters and Displays	<i>Cotillion - North</i>	8:00-5:00

IDEP Symposium	<i>Ballroom - West</i>	8:00 – 11:50
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“Update on Invasive Insects”

Organizers: Robert Trumbule and Mark Taylor, Maryland Dept. of Agriculture

- 8:00 **Introductory remarks.** Robert Trumbule, Maryland Dept. of Agriculture
- 8:05 **Invasions of the siricid kind: *Sirex noctilio* in the northeastern U.S.** Kelley E. Zylstra, USDA-APHIS, Syracuse NY and Vic Mastro, USDA-APHIS, Otis MA
- 8:35 **Effect of age and mating status on semiochemical production by female Asian longhorned beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae).** Jacob D. Wickham, Department of Environmental and Forest Biology, SUNY - College of Environmental Science and Forestry, Syracuse, NY
- 9:05 **How to win the fight against Asian longhorned beetle.** Maya Nehme, Department of Entomology, Pennsylvania State University, University Park, PA
- 9:35 **BREAK**
- 9:50 **How can a secondary pest threaten the existence of an entire genus? Co-evolution and tree resistance to wood borers.** Daniel A. Herms, The Ohio State University/OARDC, Wooster, OH
- 10:20 **Three-year patterns of EAB-induced ash decline and mortality in Huron River watershed region in Michigan.** Kamal Gandhi, Annemarie Smith, Robert P. Long, Robin A. J. Taylor, and Daniel A. Herms, The Ohio State University/OARDC, Wooster, OH
- 10:50 **The invasive species axiom “prevention”: A Chilean case study.** David L. Mausel, University of Massachusetts; R. Gara, University of Washington; and D. Lanfranco, Universidad Austral de Chile

Monday Morning

11:20 **Life history traits of *Halymorpha halys* (Stål)(Hemiptera: Pentatomidae) on ornamentals.** Anne L. Nielsen, Department of Entomology, Rutgers University, New Brunswick, NJ; Kim Hoelmer, USDA ARS, Newark, DE; Gary Bernon, USDA-APHIS, Otis, MA; and George Hamilton, Department of Entomology, Rutgers University, New Brunswick, NJ

11:50 **Adjourn**

General Interest Symposium

Ballroom - Center

8:30 – 11:40

“Hot Topics in Entomology”

Organizers: Rod Youngman and Doug Pfeiffer, Department of Entomology, Virginia Tech University

8:30 **Introductory remarks.** Rod Youngman, Virginia Tech

8:35 **Risk assessment of transgenic corn debris on non-target arthropods in agricultural streams.** William O. Lamp, Peter D. Jensen, and Galen P. Dively, Department of Entomology, University of Maryland, College Park, MD

9:10 **Global warming: The good, the bad and the ugly.** Michael P. Hoffmann, Cornell University Agricultural Experiment Station & Department of Entomology, Cornell University, Ithaca, NY

9:45 **BREAK**

9:55 **Distance education in the Eastern Branch: Is there a place for entomologists?** Douglas G. Pfeiffer, Department of Entomology, Virginia Tech, Blacksburg, VA

10:30 **Honey bee pests, parasites, pathogens and predators and the future of beekeeping in the US.** Nicholas Calderone, Department of Entomology, Cornell University, Ithaca, NY

11:05 **Hurry up and be patient: The long road toward a successful biological control program for hemlock woolly adelgid.** Scott M. Salom, Department of Entomology, Virginia Tech, Blacksburg, VA

11:40 **Adjourn**

Monday Morning

Industry Symposium

Ballroom - East

8:00 – 11:15

“The Age of Chemicals to the Age of Biology: The Changing Landscape within Insect Management”

Organizers: Marc L. Fisher and Brian D. Olson, Dow AgroSciences

- 8:00 **Introductory remarks.** Marc Fisher, Dow Agrosciences, Blacksburg, VA
- 8:05 **Arthropod management: From the Age of Chemicals to the Age of Biology – a perspective from Dow AgroSciences.** Brian Olson, Dow Agrosciences, Geneva, NY
- 8:30 **An evolving industry: Bayer CropScience's adaptations for the future.** David Rogers, Bayer CropScience, Research Triangle Park, NC
- 8:55 **The evolution of insect protection at Syngenta.** Aaron Franssen and Jeffrey Krumm, Syngenta Seeds, Inc., and Darren Lycan, Syngenta Crop Protection, Inc., Wilmington, DE
- 9:20 **BREAK**
- 9:35 **Evolution of research methods in contract research.** Tim White, CMS Inc., Hereford, PA
- 10:00 **Monsanto: Then, now, and what could be.** Bob DeWaine, Monsanto, St. Louis, MO
- 10:25 **A new broad-spectrum insecticide from BASF for potato and vegetable pest management.** Venkat Pedibhota, BASF, Florham Park, NJ
- 10:50 **DuPont setting standards in stewardship: Extending the life of insecticides.** Rejane Smith and James Barry, DuPont, Wilmington, DE
- 11:15 **Adjourn**

Swallow-wort Biocontrol Working Group

Boardroom 4

9:00 – 12:00

Monday Afternoon

Ornamentals Symposium

Ballroom - West

1:00 – 5:30

“Pests of Outdoor Ornamentals and Forests: What’s New?”

Organizers: Brian Kunkel, University of Delaware, Newark, DE and Daniel Gilrein, Cornell Cooperative Extension of Suffolk County, Riverhead, NY

- 1:00 **Introductory remarks.** Brian Kunkel, University of Delaware
- 1:05 **Strangers on the land, invaders at the gate: An assessment of non-indigenous insect pests of herbaceous and woody ornamentals in North American landscapes.** E. Richard Hoebeke, Department of Entomology, Cornell University, Ithaca, NY
- 1:50 **From native invasives to noninvasive exotics: Applied chemical ecology.** Stephen Teale, Department of Environmental and Forest Biology, College of Environmental Science and Forestry, Syracuse, NY
- 2:20 **Oak mortality associated with an outbreak of red oak borer [*Enaphalodes rufulus* (Haldeman)].** Melissa Fierke, Department of Environmental and Forest Biology, College of Environmental Science and Forestry, Syracuse, NY
- 2:50 **BREAK**
- 3:00 **Hemlock woolly adelgid (*Adelges tsugae* Annand) host plant resistance and results from recent studies with other ornamental plant pests.** Richard Casagrande, Department of Plant Sciences, University of Rhode Island, Kingston, RI
- 3:30 **Role of winter temperature and climate change on the survival and future range expansion of the hemlock woolly adelgid in eastern North America.** Annie Paradis, Department of Entomology, University of Massachusetts, Amherst, MA
- 4:00 **Efficacy and persistence of two neonicotinoid insecticides for control of the boxwood leafminer [*Monarthopalpus flavus* (Shrank)].** Casey Sclar, Longwood Gardens, Inc., Kennett Square, PA
- 4:30 **Open mike: Field reports, results of efficacy trials, new products and current issues.** Brian Kunkel, University of Delaware; Daniel Gilrein, Cornell Cooperative Extension of Suffolk County, and other presenters
- 5:00 **Open discussion**
- 5:30 **Adjourn**

Monday Afternoon

Student-Sponsored Symposium

Ballroom – Center

1:00 – 4:20

“The Changing Landscape of Insect-Plant Interactions: Community Ecology, Biodiversity and Conservation”

Organizer: Ezra Schwartzberg, Department of Entomology, The Pennsylvania State University, University Park, PA

- 1:00 **Introductory remarks.** Ezra Schwartzberg, Department of Entomology, The Pennsylvania State University, University Park, PA
- 1:05 **Biocontrol and biotechnology: Their bearing on biodiversity.** John Losey, Department of Entomology, Cornell University, Ithaca, NY
- 1:30 **Gall-inducing insects as drivers of insect-community composition.** John Tooker, Department of Entomology, The Pennsylvania State University, University Park, PA
- 1:55 **Molecular phylogeny of hawkmoths and the evolution of the sphingid proboscis.** Akito Kawahara (Asa Fitch Recipient), Department of Entomology, University of Maryland, College Park, MD
- 2:20 **Rapidly assessing tropical rainforest biodiversity using sphingids: Is accuracy sacrificed for speed of survey?** Jacob Wickham, Department of Environmental and Forest Biology, SUNY - College of Environmental Science and Forestry, Syracuse, NY
- 2:45 **BREAK**
- 3:00 **Phenological synchrony with host trees: A critical component of lepidopteran population dynamics.** Dylan Parry, Department of Environmental and Forest Biology, SUNY - College of Environmental Science and Forestry, Syracuse, NY
- 3:25 **Small creatures with large impacts: The role of termites in biodiversity of East Africa savannas.** Alison Brody, Department of Biology, University of Vermont, Burlington, VT
- 3:50 **Below-ground insect herbivory and manipulation of plant defenses.** Sergio Rasmann, Department of Entomology, Cornell University, Ithaca, NY
- 4:15 **Concluding remarks and discussion**
- 4:20 **Adjourn**

Monday Afternoon

Vegetable Symposium

Ballroom - East

1:00 - 5:00

"The Changing Landscape of Vegetable IPM"

Organizers: Tom Kuhar, Virginia Tech Eastern Shore AREC, Painter, VA and Ruth Hazzard, UMass Extension Vegetable Program, University of Massachusetts-Amherst

- 1:00 **Introductory remarks.** Tom Kuhar, Virginia Tech Eastern Shore AREC, Painter, VA
- 1:10 **A comparison of the efficacy and economics of conventional and biological control of European corn borer in sweet corn.** Michael Hoffmann, Department of Entomology, Cornell University, Ithaca, NY
- 1:35 **Improved control efficacy of stacked VIP3A/Cry1Ab sweet corn.** Galen Dively, University of Maryland, College Park, MD
- 2:00 **New seed treatments for insect control in legumes and cucurbits.** Joanne Whalen, University of Delaware, Newark, DE
- 2:25 **Thrips population changes in Maryland vegetables.** Jerry Brust, University of Maryland, College Park, MD
- 2:45 **BREAK**
- 3:00 **Effects of organic OMRI-certified insecticides on stink bugs.** Kathy Kamminga, Ames Herbert, Sean Malone, and Tom Kuhar, Virginia Tech, Suffolk, VA
- 3:25 **Effects of perimeter treatment for managing cucumber beetle in butternut squash.** Andrew Cavanagh, Ruth Hazzard, and Lynn Adler, University of Massachusetts, Amherst, MA
- 3:50 **Anthranilic diamides, a novel class of systemic insecticides for managing lepidopteran pests on fruiting vegetables.** Tom Kuhar, Virginia Tech Eastern Shore AREC, Painter, VA
- 4:15 **General discussion**
- 5:00 **Adjourn**

Monday Evening

Social gathering and cash bar	<i>Ballroom Foyer</i>	5:30-6:00
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Banquet and Awards	<i>Ballroom</i>	6:00-8:30
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ESA Distinguished Achievement Award in Teaching
 ESA Distinguished Achievement Award in Extension
 Award for Excellence in Integrated Pest Management
 L.O. Howard Distinguished Achievement Award
 John Henry Comstock Award
 Asa Fitch Award
 Eastern Branch Herbert T. Streu Meritorious Service Award
 Student Oral and Poster Competition Awards

Banquet Speaker:

May Berenbaum, Professor & Head, Department of Entomology, University of Illinois
 Presentation title: "*It's a Bee's World: Impacts of Colony Collapse Disorder on American Pop Culture*"

Tuesday March 11, 2008**Tuesday Morning**

Eastern Branch Business Meeting	<i>Ballroom – East</i>	7:00-7:45
Registration Mark Taylor, Maryland Dept. of Agriculture	<i>Ballroom Foyer</i>	8:00-10:00
Local Arrangements Carolyn Klass, Cornell University	<i>Headquarters Room</i>	8:00-12:00
Posters and Displays	<i>Cotillion – North</i>	8:00-12:00

Fruit Symposium	<i>Ballroom – West</i>	8:00 – 12:00
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“The Food Quality Protection Act: The Fruit Industry View 10 Years Later”

Organizers: Cesar Rodriguez-Saona, Department of Extension Specialists, Rutgers University, Chatsworth, NJ and Arthur Agnello, Department of Entomology, NYSAES, Geneva, NY

***See appendix D for abstracts of talks from this section**

- 8:00 **Introductory remarks.** Cesar Rodriguez-Saona, Rutgers University, Chatsworth, NJ
- 8:05 **The golden era of applied entomology is coming.** Charles Vincent, Noubar J. Bostanian, and Jacques Lasnier, Agriculture & Agri-Food Canada, Saint-Jean-sur-Richelieu, Québec
- 8:30 **Creating a marketing niche for apples treated with reduced-risk pesticides.** Harvey Reissig, Arthur Agnello, Department of Entomology, NYSAES, Geneva, NY; David Cooley, Microbiology Department, University Massachusetts, Amherst, MA; Jon Clements, UMass Extension, Belchertown, MA; Michael Rozyne, Red Tomato, Canton, MA; and Tom Green, IPM Institute of North America, Madison, WI
- 8:55 **Establishing commercial utility of behavioral control for apple maggot fly.** Starker Wright, USDA-ARS Appalachian Fruit Research Station, Kearneysville, WV
- 9:20 **Increasing precision application of FQPA-inspired pest management tools in Hudson Valley pome fruit.** Peter Jentsch, Department of Entomology, Cornell University, Hudson Valley Lab, Highland, NY

Tuesday Morning

- 9:40 **BREAK**
- 9:50 **Ten years of risk reduction in Québec apple orchards.** Gérard Chouinard, Research and Development Institute for the Agri-Environment, Saint-Hyacinthe, Québec
- 10:15 **New Jersey cranberries 10 years after FQPA: Surprises and challenges.** Dan Schiffhauer, Ocean Spray Cranberries, Inc., Chatsworth, NJ
- 10:40 **Changes and lack of changes in grape pest management in response to FQPA.** Greg Loeb, Department of Entomology, NYSAES, Cornell University, Geneva, NY
- 11:05 **Cranberry pest management: Current status and future challenges in Massachusetts.** Anne Averill, Department of Plant, Soil, and Insect Sciences, University of Massachusetts, Amherst, MA
- 11:30 **New trends in blueberry pest management: Pesticides and otherwise.** Dean Polk, Rutgers Cooperative Extension, Rutgers University, Cream Ridge, NJ
- 11:55 **Concluding remarks**
- 12:00 **Adjourn**
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General interest symposium

Ballroom – Center

8:30 – 11:30

“Insect Imaging: Techniques for Visualizing Insects for Research and Education”

Organizer: Paul Weston, Department of Entomology, Cornell University, Ithaca, NY
 Co-moderator: Charles Vincent, Agriculture & Agri-Food Canada, Saint-Jean-sur-Richelieu, Québec

- 8:30 **Introductory remarks.** Paul Weston, Cornell University
- 8:35 **Insect specimen photography from a non-entomological photographer’s perspective.** Kent Loeffler, Department of Plant Pathology, Cornell University, Ithaca, NY
- 9:05 **Love at first sight: High resolution scanning of insects.** Mark Klingensmith, Institute for Electronic Arts, Alfred State University, Alfred, NY
- 9:35 **Atomic- and chemical-force microscopy for imaging insect nano-structures related to sensory physiology.** Thomas Baker, Department of Entomology, Pennsylvania State University, University Park, PA

Tuesday Morning

10:05 **BREAK**

10:20 **Dead or Alive: Bringing insects to life with computer and camera lucida.** Margaret C. Nelson, Rumford Graphics, Ithaca, NY

10:50 **Arachnosquitobrates: A portfolio of lithographs.** Gregory Page, Department of Art, Cornell University, Ithaca, NY

11:20 **Miscellaneous imaging techniques and closing remarks.** Paul Weston, Cornell University

11:30 **Adjourn**

Submitted Papers*

Ballroom - East

8:00-11:48

Moderators: Nick Calderone, Department of Entomology, Cornell University and Scott Geib, Department of Entomology, The Pennsylvania State University, University Park, PA

***See appendix E for abstracts of talks for this session**

8:00 **Evaluation of economic traits in package honey bees, *Apis mellifera* L.** Jamie P. Strange, USDA-ARS Pollinating Insect-Biology, Management, Systematics Research (Bee) Lab, Logan, UT and Nicholas W. Calderone, Department of Entomology, Cornell University, Ithaca, NY

8:12 **Farming for native bees.** Heather E. Harmon and Faith B. Kuehn, Delaware Dept. of Agriculture, Dover, DE and Dewey M. Caron, Dept. of Entomology & Wildlife Ecology, University of Delaware, Newark, DE

8:24 **Native bees in Massachusetts cranberry habitats.** Sunil Tewari, Molly Notestine, and Anne Averill; Plant, Soil, and Insect Sciences; University of Massachusetts; Amherst, MA

8:36 **A simple method for estimating ecosystem sustainability.** Mark W. Brown, USDA ARS, Appalachian Fruit Research Station, Kearneysville, WV and Greg Krawczyk, Department of Entomology, The Pennsylvania State University, Fruit Research and Extension Center, Biglerville, PA

8:48 **Development and evaluation of spatial sampling plans for mapping insect distributions.** Yong-Lak Park, Entomology Program, Division of Plant and Soil Sciences, West Virginia University, Morgantown, WV

Tuesday Morning

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- 9:00 **Small scale factors affecting parasitism in *Galerucella californiensis*, an introduced biocontrol agent.** Kathryn J. Norman, 82 1/2 Rue St Henri, Gatinreau, Quebec
- 9:12 **Establishment and distribution of parasitoids of *Lilioceris lili*.** Lisa A. Tewksbury and Richard A. Casagrande, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI
- 9:24 **Influence of leaf morphology on predatory mite (*Typhlodromus pyri*) abundance in grape varieties.** Rebecca L. Loughner, Jan P. Nyrop, Gregory M. Loeb, and Kiran Goldman, Department of Entomology, Cornell University, Geneva, NY
- 9:36 **Differences in thrips pressure and prevalence of Iris Yellow Spot Virus (*Tospovirus*) in transplant and direct-seeded onions.** Cynthia L. Hsu, Department of Entomology, Cornell University, Geneva, NY; Denis Shah and Marc Fuchs, Department of Plant Pathology, Cornell University, Geneva, NY; and Anthony M. Shelton and Brian Nault, Department of Entomology, Cornell University, Geneva, NY
- 9:48 **BREAK**
- 10:00 **Attraction of *Halyomorpha halys* to varying amounts of (2E,4E,6Z)- decatrienoate.** George Hamilton, Department of Entomology, Rutgers University, New Brunswick, NJ; Ashot Khimian, Invasive Insect Biocontrol and Behavior Laboratory, Beltsville Agricultural Research Center, Beltsville, MD; Anne Nielsen, Department of Entomology, Rutgers University, New Brunswick, NJ; and Peter W. Shearer, Rutgers Agricultural Research & Extension Center, Bridgeton, NJ
- 10:12 **Semiochemicals involved in host finding and mating behavior of *Sirex noctilio*.** Katalin Böröczky, Center for Chemical Ecology, The Pennsylvania State University, University Park, PA; Damon J. Crook, Joseph A. Francese, and Victor C. Mastro, USDA APHIS-PPQ, Otis ANGB, MA; and James H. Tumlinson, Center for Chemical Ecology, The Pennsylvania State University, University Park, PA
- 10:24 **Role of the gut microbial community in cellulose digestion by Asian longhorned beetle, *Anoplophora glabripennis*.** Scott Geib and Kelli Hoover, Department of Entomology, The Pennsylvania State University, University Park, PA
- 10:36 **Modeling temperature-dependent diapause termination of Japanese hornfaced bee (*Hymenoptera: Megachilidae*) adults.** Joseph B White and Yong-Lak Park, Entomology Program, Division of Plant and Soil Science, West Virginia University, Morgantown, WV and Todd P. West, Horticulture Program, Division of Plant and Soil Science, West Virginia University, Morgantown, WV
- 10:48 **Indirect effects of imidacloprid on natural enemies of the boxwood spider mite, *Eurytetranychus buxi*.** Scott Creary and Michael Raupp, Department of Entomology, University of Maryland, College Park, MD

Tuesday Morning

- 11:00 **Imidacloprid and plant defense: Effects of the insecticide on expression patterns of selected genes.** Ada Szczepaniec and Michael J. Raupp, University of Maryland, College Park, MD
- 11:12 **Insect cytochrome P450s: Thinking beyond detoxification.** Jeffrey G. Scott, Dept. of Entomology, Cornell University; Ithaca, NY
- 11:24 **A treatment of the genus *Probole* Herrich-Schäffer (Lepidoptera: Geometridae), using molecular, rearing and specimen data.** Timothy J. Tomon, Section of Invertebrate Zoology, Carnegie Museum of Natural History, Pittsburgh, PA
- 11:36 **DNA analysis of subterranean termite populations in Delaware.** Susan King, University of Delaware, Dept of Entomology & Wildlife Ecology, Newark, DE and Carl Schmidt, University of Delaware, Dept of Animal and Food Sciences Newark, DE
- 11:48 **Adjourn**
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Meeting Adjourned

12:00

APPENDIX A

Student Poster Competition Abstracts

1. Applying Dyar's Law to the growth of *Sigara mathesoni* (Hungerford) (Heteroptera: Corixidae).

Dustin R. Shull, Gregory S. Paulson and Richard L. Stewart, Dept. of Biology, Shippensburg University, Shippensburg, PA.

Eggs were collected in the laboratory from adult *Sigara mathesoni* collected in Big Spring Creek, PA and allowed to hatch. Head width and body length measurements were measured at each of the five nymphal instar progressing to adult using NIH Image. Dyar's law was then applied to the data. Data suggests that Dyar's geometric growth model fits the development of *S. mathesoni*, and that developmental stage can easily be determined by measurement of head width. During the final two nymphal instars *S. mathesoni* head width and body length were shown to be sexual dimorphic; males being smaller than females.

2. Changes in nest dispersion of *Formica exsectoides* over a ten year period on South Mountain, PA

Kevin Chase, Aaron Whitcomb, Betty Ferster and Gregory S. Paulson, Dept. of Biology, Shippensburg University, Shippensburg, PA.

The Allegheny mound ant (*Formica exsectoides*) is a polygamous species of ant found throughout the Eastern USA. It builds large mounds that can reach more than a meter in height and two meters in diameter. Using GPS and Arc View we determined the dispersion of ant nests in the Big Flat area of South Mountain, PA. Nest dispersion was examined relative to soil type, vegetation and topography. Current nest dispersion was also compared to nest dispersion as determined in studies conducted in 1997 and 1998.

3. Development of *Hypena opulenta* (Lepidoptera: Noctuidae) on two species of invasive swallow-worts

Alison H. Traver, Aaron S. Weed and Richard A. Casagrande, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI.

Black (*Vincetoxicum nigrum*) and pale (*V. rossicum*) swallow-worts are invasive weeds originating from Europe that have become an environmental and agricultural problem in the northeastern United States. The goal of this study was to examine the development of *Hypena opulenta*, which is currently being screened as a potential biological control agent against swallow-worts. Development of *H. opulenta* larvae was monitored on excised leaves or whole potted plants of *V. nigrum* and *V. rossicum* to test whether host plant species or feeding treatment affected larval performance and pupal weight. Host plant species and feeding treatment did not significantly affect total larval development time or mass gain of larvae. However, larvae provided excised leaves grew faster than those given whole plants after day 13,

which corresponded to the 5th instar stage. Pupae of both sexes resulting from larvae raised on excised leaves were heavier than those reared on potted plants, but host plant did not affect pupal weight over both sexes. However, host plant species had a significant affect on the pupal weight of females, where those larvae reared on *V. nigrum* produced heavier pupae than those raised on *V. rossicum*. The results of this study demonstrated that host plant species and feeding treatment are potentially important factors affecting the development of *H. opulenta*. Our results suggested that the larval performance of *H. opulenta* was similar between the target weeds, but female fitness may be better when reared on *V. nigrum*.

4. Feeding preference of *Halymorpha halys* (Stål) in New Jersey crops: *Phaseolus vulgaris*, *Capsicum annum*, *Lycopersicon esculentum*, and *Glycine max*

Andrea E. Wagner, Anne Nielson and George Hamilton, Dept. of Entomology, Rutgers University, New Brunswick, NJ.

The brown marmorated stink bug (*Halymorpha halys*, Stål) is a highly polyphagous pentatomid insect, which has appeared in North America within the last decade. *H. halys* is a known pest in East Asia, where it is native, and has the potential of becoming an important agricultural pest here in the United States, where its population has been growing. Under laboratory conditions, we tested the feeding preference of *H. halys* between four of New Jersey's vegetable crops: green bean (*Phaseolus vulgaris*), tomato (*Lycopersicon esculentum*), bell pepper (*Capsicum annum*), and soybean (*Glycine max*), a known host plant. A no-choice test was conducted for each crop, and four-choice tests were performed with and without fruit. Each replicate lasted three days, and consisted of five bug dorms, each containing four adult *H. halys*, drinking water, and the plant(s). Feeding was measured after each replicate by dyeing the stylet sheaths in the plant tissue with an acid fuchsin stain, and counting the sheaths under a dissecting microscope. Though the data indicated no significant preference in any of the tests, there were some differences between the mean number of sheaths in the no-choice tests; peppers and green beans were fed on more than soybean and tomato.

5. Ovarian development in *Halymorpha halys* (Hemiptera: Pentatomidae)

Zack F. Russo, Anne Nielsen and George Hamilton, Dept. of Entomology, Rutgers University, New Brunswick, NJ.

There is a limited amount of biological information on *Halymorpha halys*, in both its native land of Asia and the current populations in the United States, regarding reproductive cycles and ovary maturation. A ranking system for ovarian development needs to be established to further physiological and reproductive information. Dissections were done on females with distinct post eclosion days and characters such as spermatheca length and width; terminal oocyte length, etc. etc. were measured using a stereomicroscope. Ovarian development was ranked according to oocyte development and spermatheca size, to establish distinct stages of ovarian development. The ovaries were dissected and pictures were taken. Drawings were created using Adobe CS3, based on the pictures taken from the dissections of each distinct stage of development.

6. Fitness of cytochrome P450 monooxygenase-mediated permethrin resistance in the mosquito under three environmental conditions

Melissa C. Hardstone, Brian P. Lazzaro and Jeffrey G. Scott, Dept. of Entomology, Cornell University, Ithaca, NY.

Culex pipiens quinquefasciatus fitness of an insecticide resistance allele is important for understanding the evolution of resistance in a pest population. Population cage experiments allow for laboratory controlled analysis of the fitness imparted by the resistance mechanism in different environments. In this study, the ISOP450 strain of *Culex pipiens quinquefasciatus* with 1,300-fold permethrin resistance mediated exclusively by a cytochrome P450 monooxygenase (P450) was crossed to an isogenic susceptible lab strain. The F2 and subsequent progeny were reared under one of three environmental conditions: cold temperature stress, insecticide-free and temephos (an organophosphate) exposure, for a total of 12 generations. Diagnostic doses of permethrin which distinguished SS, RS and RR were used to measure genotype and allele frequencies through time. The fitness of the P450 mechanism was determined by examining the R allele frequency through time. The mechanism was considered costly when the frequency decreased, beneficial when the frequency increased and fitness was considered neutral when the frequency remained constant. As such, the fitness of the P450 mechanism was neutral in the cold temperature stress condition (with an associated heterozygote genotype advantage). A fitness cost was associated with the P450 mechanism in the insecticide-free condition, and there was a greater fitness cost associated with the temephos exposed environment. These results indicate that fitness of this P450 insecticide resistance mechanism varies depending on the environment and that in an untreated environment, resistance conferred by this mechanism can decrease over time.

7. Spatial distribution of *Laricobius nigrinus* and *Laricobius rubidus* within four HWA-infested hemlock stands

Gina A. Davis, Scott M. Salom and Loke T. Kok, Dept. of Entomology, Virginia Tech, Blacksburg, VA.

Laricobius nigrinus Fender (Coleoptera: Derodontidae) continues to show promise as a biological control agent against the hemlock woolly adelgid, *Adelges tsugae* Annand (Hemiptera: Adelgidae) in the eastern United States. Understanding the dispersal potential of this introduced predator in its newly established range (from Pennsylvania south to Tennessee) may facilitate strategic planning of future release locations based on dispersal attributes. At the same time, a native predator of pine bark adelgid (*Pineus strobi* Hartig), *Laricobius rubidus* LeConte, is continually recovered on HWA infested hemlocks. Between March 30 and April 29, 2007, up to sixteen points were sampled at four forested sites of known *L. nigrinus* establishment. *Laricobius* larvae were reared from the samples and identified using PCR-RFLP. *Laricobius rubidus* is abundant in the mixed hemlock forest, even in the absence of its traditional host. *Laricobius nigrinus* was recovered up to 100 meters from the original release area, yet its presence may extend beyond this range. Additional sampling will continue in the spring of 2008 and 2009.

8. Host-shifting potential in *Tetraopes tetraophthalmus* onto *Vincetoxicum* and related species

Paul C. Sokoloff and Naomi Cappuccino, Dept. of Biology, Carleton University, Ottawa, ON.

Vincetoxicum rossicum and *V. nigrum* (Asclepiadaceae) are herbaceous vines highly invasive in Eastern Canada and the Northeastern United States. Although most native arthropods are conspicuously absent from stands of *Vincetoxicum*, the Red Milkweed Beetle (*Tetraopes tetraophthalmus*), a specialist herbivore on milkweed, has been observed feeding on these plants. Using no-choice herbivory experiments, we compared the propensity of *T. tetraophthalmus* to feed on the novel host *Vincetoxicum*, the beetle's primary host *Asclepias syriaca*, and three other asclepiads, *A. incarnata*, *A. tuberosa*, and *Apocynum cannabinum*. Although *A. syriaca* experienced the highest levels of herbivory, the beetles fed on both species of *Vincetoxicum*, and feeding damage on *V. nigrum* was not significantly different from that on *Asclepias incarnata*, which is used by the beetle in some parts of its range. *A. cannabinum* was untouched. In no-choice oviposition experiments, there was no difference in the number of eggs laid between *Asclepias* spp. and *Vincetoxicum* spp.

9. Are you what you eat: Do polyphagous forest Lepidoptera exhibit host-associated genetic differentiation?

J. Gwen Shlichta and Pedro Barbosa, Dept. of Entomology, University of Maryland, College Park, MD.

A central theme in ecology is understanding the factors that influence interacting animal and plant species. This study focuses on the role of a plant host as a driving force for genetic changes in herbivores. In this study, I examined representative species of lepidopteran larvae found on several tree species in forests of central Maryland for genetic host-associated differentiation. Larvae were collected from three different tree species at three different sites in Maryland. DNA was extracted from the adult moth for analysis of genetic differentiation. Using Amplified Fragment Length Polymorphism (AFLPs), each species was examined for host-associated genetic differentiation using GeneMapper and neighbor-joining trees were constructed using the Nei Li similarity index. As in other ecological studies that examine representative species of assemblages or guilds, changes in some species are distinct from those of other species in the assemblage on each tree host species. In addition, changes in clusters of species, of those that comprise the assemblages on trees, parallel each other but are distinct from other clusters in regard to genotypic changes. This study expands on our knowledge of how generalist species interact with their host plant in a spatially structured environment.

10. The role of pollen in the transmission of viruses in the pollinator community

Rajwinder Singh¹, Abby L. Kalkstein¹, Diana L. Cox-Foster¹, Edwin G. Rajotte¹, Dennis van Engelsdorp², Claude W dePamphilis³, Rick Donovall², Nancy Ostiguy¹, and Owen Thompson¹, (1) Dept. of Entomology, The Pennsylvania State University, University Park, PA; (2) Pennsylvania Department of Agriculture, Bureau of Plant Industry-Apiculture Section, Harrisburg, PA; (3) Dept. of Biology, The Pennsylvania State University, University Park, PA.

Viral pathogens are suspected contributors to colony collapse disorder (CCD) that has resulted in a sharp decline of honey bee (*Apis mellifera*) colonies. Understanding the transmission of bee viruses can shed light on the epidemiology of this syndrome. Previous research has demonstrated the occurrence of vertical transmission of bee viruses from infected queen/drones to offspring, as well as the role of Varroa mites in horizontal transmission. However, recent reports of deformed wing virus (DWV) from bumble bees (*Bombus* spp.) and detection of viruses in the hive food reserves, suggests the possibility of field spread of these viruses with much broader implications for the overall pollinator community. This study focused on pollen as a possible route for virus transmission among honey bees and between honey bees and other hymenopteran pollinators. We report the presence of bee viruses (DWV, Sacbrood Virus and Black Queen Cell Virus) in pollen pellets collected from honey bee foragers. Furthermore, some uninfected foragers were carrying virus infected pollen, indicating that pollen itself can spread the virus. We also found these viruses in other hymenopterans including bumble bees (*B. vagans*, *B. ternarius*), solitary bees (*Andrena* sp., *Ceratina dupla*, *Augochlora pura*), yellow jackets (*Vespula* sp.) and paper wasps (*Polistes* sp.), indicating that bee viruses have much wider host range than previously thought. The identity of the viruses in the honey bees, pollen, and other pollinators was confirmed by sequencing. This study adds to our understanding of bee viruses, and may help explain bee disease patterns and pollinator population decline.

11. Phylogenetic supermatrix analysis of *Obtectomera* Lepidoptera: Total evidence from 7 genes and 1796 species

Akito Y. Kawahara¹, Adam Bazinet² and Michael P. Cummings², (1) Dept. of Entomology, University of Maryland, College Park, MD; (2) Center for Bioinformatics and Computational Biology, University of Maryland, College Park, MD.

A phylogenetic supermatrix analysis of the hyper-diverse Lepidopteran group, *Obtectomera* was conducted. In total, 1796 species were sampled for six protein-coding nuclear genes and one mitochondrial gene. Unpublished sequences generated from the AToL LepTree Team (Regier et al., in prep) were combined with available sequences from GenBank. A semi-automated pipeline was designed to construct the supermatrix. Multiple sequence alignments were conducted separately for each gene, and the seven data sets were concatenated into a single supermatrix. Multiple sequences of the same species were fused using IUPAC/IUB ambiguity codes and made into a single consensus sequence representing that particular species. Maximum likelihood analyses were conducted using parallel Grid computing and processors on the University of Maryland Altus 3400 Server. Results were generally in concordance with a preliminary molecular analysis with lesser taxon and gene sampling. However, unlike prior molecular analyses, results from the present study recovered a monophyletic *Obtectomera*, a result which has traditionally been supported by morphology.

APPENDIX B

Submitted Poster Abstracts

12. The effect of methamphetamine on decomposition of carrion and maggot growth

Monica Scarazzo, Dept. of Biology, Shippensburg University, Shippensburg, PA; Anne Michelson, Cumberland Co. Office of the District Attorney, Forensic Laboratory, Carlisle, PA; and Gregory S. Paulson, Dept. of Biology, Shippensburg Univ., Shippensburg, PA

Two male pigs were euthanized and left to naturally decompose. One pig was injected arterially with a potentially lethal dosage of methamphetamine that was allowed to circulate in the pig for ten minutes prior to euthanization. Maggots were collected daily from three locations (anterior, posterior and the lethal wound site) on each pig. A portion of each sample was preserved in 80% ethanol the remaining maggots were reared to adult to facilitate species level identification.. Preserved maggots were measured using NIH Image software and weighed to determine if there was a relationship between maggot size and injection of methamphetamine prior to death. Chromatography (HPLC) was used to test a sub-sample of each maggot sample for the presence of methamphetamine. Tissue samples were also taken from the treated pig and analyzed for the presence of methamphetamine. Ambient and internal pig temperatures were recorded throughout the experiment using a data logger. The progression of pig decomposition over a two-month period was observed and photographed. The implications of this study for the determination of post-mortem interval in methamphetamine users are discussed.

13. RNA-editing and alternative exon usage in nicotinic acetylcholine subunits in *Tribolium castaneum*

Frank D. Rinkevich and Jeffrey G. Scott, Department of Entomology, Cornell University, Ithaca, NY

The red flour beetle, *Tribolium castaneum*, is a global pest of stored and processed grains and the first Coleopteran to have its genome sequenced. As such, the need to understand the mechanisms of insecticide resistance before they manifest in the field is an important area of study. The insecticides spinosad and imidacloprid are nicotinic acetylcholine receptor (nAChR) agonists that non-competitively and competitively interact with the receptor respectively. Each receptor is a multimeric protein composed of 2-5 different subunits which presents challenges in identification of the subunits responsible for insecticide mechanism of action as well as for identification of mutations that could be responsible for insecticide resistance. While the *Tribolium* genome revealed there were 12 nAChR subunits, features of alternative transcripts and RNA editing required characterization of all the different transcripts. Therefore, we sequenced the cDNAs the 12 nAChRs (11 α and 1 β) from *Tribolium castaneum*. Our results show that alternative splicing and RNA editing of nAChR in *Tribolium castaneum* is similar to what has been reported in other insects suggesting evolutionary conservation of these post-transcriptional modifications.

APPENDIX C

Student Oral Presentation Competition Abstracts

12:00 Screening for resistance and impact of onion thrips (*Thrips tabaci* Lindeman) and Iris yellow spot virus on onion growth

John Diaz-Montano¹, Anthony M. Shelton¹, Brian A. Nault¹ and Marc Fuchs². (1) Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY; (2) Dept. of Plant Pathology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY

Onions, *Allium cepa* L., are an important crop in New York state and onion thrips (OT), *Thrips tabaci* Lindeman, are a devastating onion pest. OT feeding alone can cause substantial yield losses but can be even more problematic when it occurs with *Iris yellow spot virus* (IYSV) transmitted by OT. IYSV was confirmed in the summer of 2006 in New York state. OT are difficult to control with conventional insecticides. For these reasons and the importance of onion production in New York, field studies on onion resistance to OT and/or to IYSV were performed. In the first experiment, 22 onion varieties were screened for resistance to OT and/or IYSV. The number of thrips larvae was counted weekly and visual leaf damage ratings of feeding were made. In the second experiment, the impact of OT/IYSV interaction on plant growth was studied. There were two treatments, protected with an insecticide and the other not protected. Eight varieties showed the lowest leaf damage compared to susceptible varieties. Five of these varieties (Colorado 6, OLYSO5N5, Cometa, Tioga and BGS-230) may possess antibiosis and/or antixenosis because of the lower number of thrips found on them. The other three varieties (Peso, Delgado and Calibra) had higher number of thrips indicating possible tolerance. There was a significant reduction in plant height and weight in the varieties evaluated. At the end of the season all the plants (1,256) were tested to detect the presence of IYSV using ELISA tests. About 10% of the plants resulted infected with IYSV.

12:12 Are aphids stealthy, or are they manipulative? Suppression of caterpillar-induced volatile emission in broad bean plants by the pea aphid, *Acyrtosiphon pisum*

Ezra G. Schwartzberg and James H. Tumlinson, Dept. of Entomology, Center for Chemical Ecology, The Pennsylvania State University, University Park, PA

Plants are able to defend themselves against herbivory through several means including the production of airborne volatile compounds that attract natural enemies. The pea aphid, *Acyrtosiphon pisum*, is able to feed on broad bean plants without inducing detectable changes in volatile emission. Additionally, pea aphids inhibit volatile emission normally increased in response to feeding by the beet armyworm caterpillar, *Spodoptera exigua*. Some of the caterpillar-induced volatiles that are inhibited by aphid feeding are known attractants to the aphid parasitoid *Aphidius ervi*. These compounds include the terpene (E)- β -ocimene and the green leafy compounds (Z)-3-hexen-1-ol and (Z)-3-hexenyl acetate. The ability of aphids to inhibit herbivore-induced volatile signals provides insight into a

mechanism by which aphids can overcome induced plant defenses that attract parasitoids and predators by manipulating volatile production.

12:24 CANCELLED

12:36 Herbivory on invasive exotic plants

Tania Jogesh and Naomi Cappuccino, Dept. of Biology, Carleton University, Ottawa, ON

While many plant species have been accidentally introduced to new geographical ranges, only a small proportion have become invasive. The ability of these invasives to expand and out-compete native flora has been attributed lower herbivory and pathogen loads on introduced populations. The novel defense hypothesis suggests that these plants are protected by an arsenal of secondary chemicals that is unique to the new range and this novel chemistry might be responsible for deterring unacquainted native herbivores. In order to validate these assumptions we tested plants belonging to three plant families: Apiaceae, Brassicaceae and Fabaceae. These plants were ranked according to their invasiveness based on several lists composed by governmental and non-governmental organizations. We found that plants that were more invasive had lower herbivore damage in the field and were less palatable to the generalist herbivore *Pseudaletia unipuncta*. However, herbivory by the corn earworm, *Heliothis zea*, did not depend on the invasiveness of the plant as expected.

12:48 Leek moth life tables and field efficacy of a candidate biocontrol agent

Wade H. Jenner¹, Ulrich Kuhlmann¹, Peter G. Mason² and Naomi Cappuccino³. (1) CABI Europe – Switzerland, Delémont, Switzerland; (2) Eastern Cereal and Oilseed Research Centre, Ottawa, ON; (3) Dept. of Biology, Carleton University, Ottawa, ON

Leek moth, *Acrolepiopsis assectella* (Zeller) (Lepidoptera: Acrolepiidae), is a Palearctic, multivoltine pest of cultivated *Allium* species, commonly occurring on leeks, onions, garlic and chives. This moth has been present in southeastern Ontario since at least 1993 and its North American distribution expands each year. Leek moth can be very problematic, particularly in organic *Allium* production systems, since growers are unaccustomed to the pest and native natural enemies seem to have little effect. To understand the impact that natural enemies may have on leek moth in its native range, a life table study was carried out over three summers in central Europe. Mortality was lowest in the larval stages (generally less than 30%), owing to the concealed nature of the leaf-mining larvae. In contrast, the exposed eggs and pupae typically suffered mortality rates of over 50%. A comparison of leek moth mortality on caged and uncaged plants revealed a consistent and significant impact of natural enemies on leek moth pupae. The European pupal parasitoid *Diadromus pulchellus* Wesmael (Hymenoptera: Ichneumonidae) was found to attack leek moth throughout the entire growing season and is currently being evaluated as a classical biological control agent for release into Canada. As part of this assessment, field efficacy trials were conducted in the agent's native range. Small-scale field releases of *D. pulchellus* into infested leek plots were carried out to measure the establishment success and impact of the agent on leek moth populations.

1:00 Forgotten paradise: Did the holarctic genus *Wockia* (Lepidoptera: Urodidae) originate in the Neotropics?

Jae-Cheon Sohn, Dept. Entomology, University of Maryland, College Park, MD

Wockia Heinemann, 1870 is a small genus of Urodidae, hitherto comprising only three species: *W. asperipunctella* (Bruand, 1852), *W. balikpapanella* Kyrky, 1986, and *W. koreana* Sohn, 2008. The known distribution of the genus has previously been restricted to the Holarctic and Oriental regions, in contrast with other urodids which are most diverse in the Neotropics. Recently, two new *Wockia* species were reported from Mexico (D. Adamski and K. Boege, pers. comm.), indicating that this genus also occurs in the Neotropical region. In this study, three new species of *Wockia sensu lato* are reported from Costa Rica and Venezuela. The new findings call for re-examination of this generic concept, and suggest that the center of diversity for *Wockia* and possibly its origin may lie in the Neotropics. The hypothesis is tested using a morphology-based phylogenetic approach.

1:12 Bean leaf beetle economic injury level on early-stage snap beans

Meredith E. Cassell¹, Thomas P. Kuhar¹, Peter B. Schultz² and Doug Pfeiffer³. (1) Dept. of Entomology, Eastern Shore Agricultural Research & Extension Center, Painter, VA; (2) Dept. of Entomology, Hampton Roads Agricultural Research & Extension Center, Virginia Tech, Virginia Beach, VA; (3) Dept. of Entomology, Virginia Tech, Blacksburg, VA

The bean leaf beetle (BLB), *Cerotoma trifurcata* (Forster), is a major pest of snap beans in the eastern and central U.S. Adults can completely defoliate young plants as well as scar bean pods. In order to gain more insight into the impact of BLB defoliation on snap beans we conducted field-cage as well as manual leaf hole-punch studies. Walk-in exclusion cages were used to house snap bean plants in the field containing BLB densities ranging from zero to 115 beetle days per plant. Foliar damage was assessed using a leaf area meter at 30 and 40 days post planting while whole-plant and pod yields were assessed at harvest. BLB density had a significant effect on defoliation and leaf area at 30 days after planting, but not at 40 days post planting. Manual defoliation trials simulate early-season feeding as well as season-long feeding by the BLB in snap beans. Defoliation levels were 0, 25, 50, and 75%. There was a significant decline in pod production at greater than or equal to 50% defoliation in both the early-season and season-long defoliation studies. Economic injury levels for early-season snap bean defoliation are discussed.

1:24 *Loxosceles reclusa* envenomation: An examination of cytoskeletal restructuring, and the potential chemical reversal of the effects of the venom

Rachel R. M. Dwyer and David A. Bell, Jr., Dept. of Biology, St. Vincent College, Latrobe PA

Sphingomyelinase-D, an enzyme in the venom of *Loxosceles reclusa* (Brown Recluse Spider), has been found to interact adversely with a cell's membrane, causing severe

damage and eventually cell death. Part of the process of cell death induced by envenomation may include restructuring of the cytoskeleton. To examine this potential reconstruction, NIH 3T3 Mouse Fibroblasts were treated with *Loxosceles* venom, and the cytoskeletons of the cultured cells were immunofluorescently stained and microscopically examined. Viability of the cells post-treatment was determined using an MTT assay, additionally a caspase assay was used to determine whether cell death was the result of apoptosis. Three different treatments (EDTA, tetracycline, and Dapsone), whose effectiveness in healing *Loxosceles reclusa* wounds are being investigated, were introduced to the envenomated fibroblasts, to examine whether they reverse the cytoskeletal effects of the venom. If they are capable of reversing the cytoskeletal restructuring, other drugs that work through similar mechanisms should be explored to determine if they could be of equal or greater effectiveness in healing *Loxosceles* wounds.

1:48 Assessing possible sources of onion thrips-transmitted Iris yellow spot virus in New York onion fields

Erik A. Smith¹, Cynthia L. Hsu¹, Marc Fuchs², Anthony M. Shelton¹, Christine A. Hoepting³ and Brian A. Nault¹, (1) Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY; (2) Dept. of Plant Pathology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY; (3) Cornell Cooperative Extension, Cornell Vegetable Program, Albion, NY

Migrating eastward from previously-infected onion fields in the western US, *Iris Yellow Spot Virus* (IYSV) is a yield-reducing pathogen that was first detected in New York onion fields in 2006. IYSV is a *Tospovirus* transmitted only by onion thrips, *Thrips tabaci* (Lindeman). Before an effective strategy can be developed to manage IYSV, it is important to identify and assess the possible sources of the virus. Two of the most likely sources include onion transplants originating from States known to be IYSV-positive, and volunteer onions, which are onion bulbs left in the field from the previous harvest. To assess the likelihood that transplants and volunteers are sources, we used DAS-ELISA to test for IYSV in 11 varieties of transplants imported from Arizona, where IYSV is known to occur, and volunteer onions from 9 fields in NY. All transplant samples tested negative for the virus (0 out of 5,400 samples), while several volunteer onions have tested positive (3 out of 231). Results of these assays have laid the groundwork for future studies on the epidemiology of IYSV, impact on onion crops, and relationship with onion thrips dispersal.

2:00 Soil management effects on entomopathogenic fungi during the transition to organic agriculture

Randa Jabbour¹, Andrew G. Hulting², Christina A. Mullen¹ and Mary E. Barbercheck¹, (1) Dept. of Entomology, The Pennsylvania State University, University Park, PA; (2) Oregon State University

The continually growing demand for organic products exceeds supply, creating opportunities for farmers. However, conventional farmers need to know the consequences of their management practices on the likelihood of successful conversion to organic production. We examined the interaction between soil disturbance and initial cover crop

type and management on weed populations, soil quality, and economic performance during the three-year transition to organic production in a feed grain rotation in central Pennsylvania. Our experiment included four systems comprised of a factorial combination of two levels of primary tillage (conventional vs. reduced) and two types of initial cover crop (perennial sod/legume vs. annual cereal grain/legume). Over a three-year transition period, the cropping sequence consisted of an initial cover crop, followed by soybean, and finally, maize. Here, we discuss the impact of these treatments on naturally occurring entomopathogenic fungi (EPF), indicators of the ability of the soil to resist outbreaks of insect pests. Biological control is an essential component of pest management in organic systems. We detected EPF by bioassay of soil samples collected four times during each field season. We detected four species of EPF: *Metarhizium anisopliae*, *Beauveria bassiana*, *Isaria fumosorosea*, and *Isaria farinosa*. Greater detection of EPF occurred during the initial cover crop than during soybean or maize production. EPF were favored in systems that used conventional tillage. The presence of EPF was negatively associated with soil moisture and the concentration of permanganate oxidizable carbon in soil. This study informs farmers of how management affects soil function, specifically conservation biological control.

2:12 Oviposition by the fungus gnat *Bradysia impatiens* (Diptera: Sciaridae) on *Pythium* spp.-infected geranium plants (*Pelargonium x hortorum*).

Sarah E. Arnold¹, Stephen P. Wraight², Eric B. Nelson³ and John P. Sanderson¹, (1) Dept. of Entomology, Cornell University, Ithaca, NY; (2) USDA-ARS, US Plant, Soil and Nutrition Laboratory, Ithaca, NY; (3) Dept. of Plant Pathology, Cornell University, Ithaca, NY

Dark-winged fungus gnats in the genus *Bradysia* (Diptera: Sciaridae) are abundant greenhouse pests. Studies have pointed to a connection between plant pathogens and greenhouse-inhabiting fungus gnats. However, little research has been done on the association of fungus gnats with *Pythium* spp. in greenhouse floriculture, though *Pythium* spp. are among the most serious root pathogens. As part of a research program on the interactions among *B. impatiens*, *Pythium* spp., and bedding and potted floral crops, the goal of this study was to determine whether *B. impatiens* adults prefer to oviposit on geranium plants infected with *P. aphanidermatum*, *P. ultimum*, or *P. irregulare* over uninfected or dead plants. In the first experiment, adult fungus gnats were given the choice of ovipositing on a healthy or a *Pythium* sp. infected geranium plant. To determine whether fungus gnats are attracted to *Pythium* infected plants or dead plants in general, adult fungus gnats were then given the choice of ovipositing on healthy, dead, or *Pythium* sp. infected geranium plants. When given a choice between healthy and infected geranium plants, fungus gnats laid significantly more eggs on infected plants than healthy plants. When dead plants were added to the system, fungus gnats still laid significantly more eggs on infected plants than on healthy or dead plants. There were no differences in number of eggs laid among plants infected with different *Pythium* spp. The findings from this study correlate well with results from other labs, indicating that fungus gnat survival is enhanced when fungal abundance is high.

2:24 Competition between Y^M and III^M males in the house fly, *Musca domestica* L.

Ronda L. Hamm and Jeffrey G. Scott, Dept. of Entomology, Cornell University, Ithaca, NY

In the house fly, *Musca domestica* L., sex is determined by a dominant factor, M, located on the Y chromosome. However, there are "autosomal male" (AM) strains in which the M factor is located on one or more of the five autosomes (I-V). Little is known about the selective advantages or disadvantages these two mechanisms play in populations. Therefore we looked at changes in the frequency of Y^M versus III^M in populations with initially set up with an equal proportion of Y^M and 50% III^M males. Changes were monitored every other generation. One population became fixed for the III^M sex determination by the 5th generation. The percentage of III^M males is significantly greater than Y^M males by the 5th generation in all replicates and by generation 12 III^M males range from 97.8% to 81.8%. The results show that III^M males have a selective advantage when competing with Y^M males under laboratory conditions. Possible explanations for the improved fitness of III^M males will be discussed.

2:36 Enemy release and the invasiveness of exotic knapweeds

David J. Carpenter and Naomi Cappuccino, Dept. of Biology, Carleton University, Ottawa, ON

Knapweeds, *Centaurea* spp., are among the most invasive grassland invaders in North America. Despite similar life histories, only certain members of this genus have become problem species, while others remain as benign, naturalized exotics. One idea which has been proposed to explain the success of exotic plants in introduced ranges is the enemy release hypothesis. Previous work has shown that, in comparison to related native species, introduced species suffer lower levels of insect leaf herbivory within natural habitats. More importantly, exotics which were deemed highly invasive were less fed upon by local insect faunas than non-invasives. The enemy release hypothesis was examined using seven knapweed species (three highly invasive and four non-invasive), in no-choice insect feeding trials as well as in a common garden. Non-invasives were fed on more by a generalist grasshopper, *Melanoplus femurrubrum*, and incurred significantly more leaf herbivory than invasives in the common garden. This indicates that invasive knapweeds may possess novel defenses which deter local herbivores.

2:48 Comparison of aggregation traps using the attractant methyl (E,E,Z) 2,4,6 decatrienoate for *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae)

Anne L. Nielsen¹, Peter Shearer² and George C. Hamilton¹, (1) Dept. of Entomology, Rutgers University, New Brunswick, NJ; (2) Rutgers Agricultural Research & Extension Center, Bridgeton, NJ

Halyomorpha halys (Stål) (Hemiptera: Pentatomidae) is a non-native species that is indigenous to Asia. It is polyphagous with host plants including tree fruit, soybean, and many ornamentals and it may become a pest in these crops in the United States.

Halyomorpha halys has an aggregated dispersion, which is particularly evident in the late summer when adults are preparing for diapause. Adults have previously been shown to be attracted to the (E,E,Z) 24,6 decatienoate compound in large numbers. Four traps baited with this compound were compared in late summer/early fall for the effectiveness at trapping and containing *H. halys* in ornamental plants and soybean from 2004-2006. In both systems, the yellow pyramid trap caught the highest mean number of individuals. We continued the comparison in soybean throughout the 2006 – 2007 growing season comparing two sizes of the yellow pyramid trap baited with the aggregation compound to 10m row sweeps. Again, the large pyramid trap caught the highest mean number of *H. halys*. This trap, when baited with (E,E,Z) 24,6 decatienoate compound shows promise for use in monitoring *H. halys* throughout the growing season in soybean, not just during the late summer as previously thought.

3:00 Beneficial and the beast: A test of the enemy release hypothesis

Jane E. Allison¹, Peter Mason² and Naomi Cappuccino¹, (1) Dept. of Biology, Carleton University, Ottawa, ON; (2) Agriculture and Agri-Food Canada, Ottawa, ON

The enemy release hypothesis (ERH) is put forth more than any other as the reason for the success of non native species. Introduced species are thought to gain a competitive advantage in new environments where natural enemies are absent. Introduced insects should establish large populations limited only by resource quality. Biological control (biocontrol) programs rely on the assumptions of the ERH. Specialist herbivores are imported to control invasive weeds whose success in new geographic ranges is attributed to their escape from their specialist herbivores. In turn, weed biocontrol agents (herbivores) are assumed to have escaped their own specialist enemies (parasitoids) when introduced to a new region, allowing them to reach high population densities and provide greater impact on the target weed. Experimental results have shown mixed support for this hypothesis. Parallel studies of insects in their native and introduced ranges have not supported the assumption that introduced insects escape from natural enemies. We provide a comparison of the level of parasitism of highly successful weed biocontrol agents (invasive species) and unsuccessful weed biocontrol agents (non-invasive species) in order to test this hypothesis. Populations of weed biocontrol agents were sampled and reared or dissected to examine the implications of the ERH for introduced insects. Our results suggest that successfully introduced insects may not be released from the impact of parasitoid attacks.

3:12 Evaluating the impact of growth-promoting rhizobacteria and natural enemies on *Myzus persicae* infestations in pepper

Caroline B. Hunt and Brian A. Nault, Dept. of Entomology, Cornell University, New York State Agricultural Experiment Station, Geneva, NY

Management of green peach aphid, *Myzus persicae*, in bell pepper using a combination of plant-growth-promoting-rhizobacteria (PGPR) and endemic biological control was explored in New York in 2006 and 2007. PGPRs are non-pathogenic soil bacteria that may induce plant defenses. We hypothesized that (1) *M. persicae* densities would be reduced in PGPR-treated plots compared with untreated plots and (2) natural enemy densities in PGPR-treated

plots would be higher than in untreated plots because of their attraction to elicitors triggered by the plants' exposure to PGPRs. Peppers were seeded in soil containing the PGPR formulation, BioYield™, or untreated soil. The plants were transplanted into field plots and treated with one of three insecticide treatments to manipulate aphid densities at a treatment threshold of 1 aphid per leaf. The experimental design was considered a split-plot with BioYield as the main plot factor and insecticide as the sub-plot factor. Apterous aphids and natural enemies were counted weekly. Peppers were harvested 3 times. BioYield did not significantly affect aphid densities in either year. In 2006 only, BioYield-treated plots had significantly higher densities of natural enemies than in untreated plots. This result was likely a density-dependent response rather than a response of natural enemies to elicitors from PGPR-treated plants. In 2006, yield in BioYield plots significantly higher in the first and third harvests, suggesting that BioYield may enhance yield. BioYield had no impact on yield in 2007. An economic analysis is needed to determine whether the cost of application is worth the potential of increased yield.

3:36 The influence of native plants on arthropod population dynamics: Can native plants enhance conservation biological control?

Ellery Vodraska¹, Douglas Tallamy², Paula Shrewsbury¹ and Michael Raupp¹, (1) Dept. of Entomology, University of Maryland, College Park, MD; (2) Dept. of Entomology and Wildlife Ecology, University of Delaware, Newark, DE

Maintaining a diverse population of prey in an urban landscape is necessary to attract and support sustainable populations of predators and parasitoids. This relationship is fundamental to the implementation of conservation biological control. The modern urban landscape is dominated by alien ornamentals; these plants may be unacceptable hosts for many of the specialist herbivores that evolved to be dependent on native plants. Alien dominated landscapes may therefore host a less diverse prey population for natural enemies. We predict that landscapes that are dominated by native plants host a diverse herbivore population that will attract and sustain a diverse community of predators and parasitoids relative to landscapes dominated by alien plants. Two types of 'urban' landscapes were planted to test this prediction; one dominated by native ornamentals and another dominated by alien ornamentals. The plants within the native and alien landscapes were sampled twice during the growing season to quantify the density and diversity of their herbivore and natural enemy populations. To compare herbivore survival, known numbers of six herbivore species were placed in the landscapes and their abundance was monitored over time. Native and alien plants were assessed visually to determine the degree of aesthetic injury caused by insects. The results presented are the preliminary results from the first two years of a three year study.

3:48 Evidence for female pheromones of the Asian longhorned beetle, *Anoplophora glabripennis* (Coleoptera: Cerambycidae)

Jacob D. Wickham and Stephen A. Teale, Department of Environmental and Forest Biology, SUNY - College of Environmental Science and Forestry, Syracuse, NY

Semiochemicals of the Asian Longhorn Beetle (*Anoplophora glabripennis*) were identified using electroantennography coupled gas chromatography (GC-EAD) techniques. Plant volatiles of host and non-host trees were collected on Super-Q adsorbent and were extracted for GC-EAD analysis. Several volatiles were common across the host range of ALB (and absent in non-hosts), including cis-3-hexene-1-ol, caryophyllene, delta-3-carene, linalool, and camphene. Volatile pheromone components were collected from female ALB or activated female extracts. These compounds are produced from known precursors (found in females and absent in males) and were shown to be antennally active in male ALB antennae. Bioassays were performed using a Y-maze olfactometer. The activated female extracts were more attractive to male ALB than regular extracts, and synthetic compounds of the EAD-active parts of the female extracts were more attractive than controls. The pheromone components and plant volatiles were tested in July 2006 and July - August 2007 in Ningxia, China using a randomized complete block design with flight intercept panel traps. The pheromone blend components and plant volatiles combined were more attractive to ALB than controls in the field studies conducted in July 2006, but had equal sex ratios. Results from the 2007 field season suggest that female pheromone blends plus plant volatiles were more attractive to males.

4:00 Potential use of *Hypena opulenta* (Lepidoptera: Noctuidae) as a biocontrol agent of swallow-worts (*Vincetoxicum* spp.)

Aaron S. Weed and Richard A. Casagrande, Dept. of Plant Sciences, University of Rhode Island, Kingston, RI

Hypena opulenta was collected from the southern region of Donetsk, Ukraine in 2006 during surveys for potential biocontrol agents of swallow-worts (*Vincetoxicum*) from *V. rossicum* and *V. scandens* in wooded ravines. This species caused extensive localized damage to the leaves of each host ultimately preventing flowering. *Hypena opulenta* is recorded from Ukraine, Turkmenistan, Turkey, and Iran, but the host plant has never been documented. Laboratory host range studies suggest that *H. opulenta* is a multivoltine species that is monophagous on *Vincetoxicum* spp. Larval performance was similar on *V. rossicum* and *V. nigrum* but better than on *V. hirundinaria*. Females reared on each target weed survived for 16d in the laboratory, began oviposition after 2d, and preferred to lay eggs on the undersides of leaves and within the groove on the leaf petiole. Maternal host (target weeds only) did not affect fitness of females, although pupal weight of female larvae raised on *V. nigrum* was greater than those raised on *V. rossicum*. Female pupal weight was greater than males but host plant did not affect the weight of male pupae. Females displayed no preference in laboratory choice oviposition assays among hosts. Due to the life history, habitat requirements, ability to develop similarly on both target weeds, and observed larval specificity of *H. opulenta*, we feel there is strong evidence to continue evaluating this agent as a biocontrol agent of swallow-worts.

4:12 Gill-plate ventilation kinematics and ontogenetic transitions in the nymphal mayfly *Centroptilum triangulifer*

Andrew T. Sensenig¹, Jeffrey W. Shultz¹ and Kenneth T. Kiger², (1) Dept. of Entomology, University of Maryland, College Park, MD; (2) Dept. of Mechanical Engineering, University of Maryland, College Park, MD

The serial array of abdominal gill plates in the nymphal mayfly (*Centroptilum triangulifer*) operate across a range of intermediate Reynolds numbers ($Re=2-22$). In this paper, we assess fluid dynamic transitions as Re number increases with animal growth. Orthogonal perspectives of nymphs (length 2.0-5.6 mm) were captured at 1000 fps, and three-dimensional coordinates of the oscillating gill-plates were reconstructed. Gill-plates operated with the same metachronal phase lag between anterior and posterior gills as size increased, but switched from strokes with a high degree of pitching and stroke plane deviation to strokes with minimal pitching, minimal stroke plane deviation, and significant flexing at a clearly defined hinge line. Net flow through the gill array switches from a weak ventrally directed flow to a strong dorsally directed current. A transition in both kinematics and the resulting current occurs over the narrow Re range of 4-6.

4:24 Stimuli associated with aggregative oviposition of viburnum leaf beetle [*Pyrrhalta viburni* (Paykull)]

Gaylord A. Desurmont and Paul A. Weston, Dept. of Entomology, Cornell University, Ithaca, NY

Pyrrhalta viburni (commonly known as viburnum leaf beetle), an invasive chrysomelid native to Europe and first detected in the USA in 1994, is becoming a major landscape pest in the Northeast and poses a serious threat to a large portion of the U.S. Larvae and adults feed on shrubs in the genus *Viburnum*, and plants in both managed landscapes and natural areas are at risk. *P. viburni* adult females lay eggs in groups in small cavities they excavate in the twigs and cover them with a cap of a frass-like secretion. Oviposition behavior of *P. viburni* females is aggregative, females preferring to lay eggs in close proximity to egg masses laid by other females. Choice-tests were conducted in the laboratory to determine the importance of potential oviposition stimuli: egg mass of another female, egg cap, artificial egg cap, empty egg cavity, artificial cavity, eggs, and plant reaction (=twigs exhibiting production of wound tissue in response to oviposition). Twigs with presence of another egg mass were preferred for oviposition, and the previous egg mass was used by females as a positional stimulus, while presence of egg caps or cavities were used as positional stimuli but did not induce a twig preference. Presence of plant reaction induced a twig preference when the plant reacted in the laboratory, but only a positional preference when twigs reacted in the field. These results partially explain the process of oviposition site selection in viburnum leaf beetle, and add to our understanding of the ecology of this important invasive species.

4:36 Age-dependent differences in humoral immune responses in gypsy moth larvae

James McNeil, Diana Cox-Foster and Kelli Hoover, Dept. of Entomology, The Pennsylvania State University, University Park, PA

Within each instar, gypsy moth (*Lymantria dispar*) larvae exhibit age-dependent resistance to the baculovirus *Lymantria dispar* multiple nucleopolyhedrovirus (LdMNPV). We hypothesized that this resistance stems in part from more robust immune responses in resistant-aged larvae. We previously examined age-dependent elements of the cellular immune response, but had yet to determine if humoral defenses are also age-dependent. To test this hypothesis, we analyzed activity of the enzyme FAD-glucose dehydrogenase (FAD-GLD), a component of the pro-phenoloxidase cascade, spectrophotometrically in hemolymph samples from both susceptible and resistant aged gypsy moth larvae. There were differences in FAD-GLD activity between the two ages of insects that are consistent with our previously observed differences in cellular immune responses, suggesting that humoral and cellular responses play an important role in age-dependent gypsy moth viral resistance.

4:48 Pierce's disease in Virginia: survey of Cicadellid vectors

Anna Wallingford¹, Sue Tolin², Peter Sforza³ and Douglas Pfeiffer¹, (1) Dept. of Entomology, Virginia Tech, Blacksburg, VA; (2) Dept. of Plant Pathology, Virginia Tech, Blacksburg, VA; (3) Dept. of Geography, Virginia Tech, Blacksburg, VA

Pierce's disease (PD) is a vascular disease of grapevines caused by *Xylella fastidiosa* (Xf) which is transmitted by xylophagous insect vectors. PD infection in Virginia vineyards was thought to be isolated to southeastern portions of the state as there have been no reports of vine loss in western Virginia and cold winter temperatures experienced there limit the effects of the bacterium from year to year. Upward trends in winter temperatures have raised PD concern in the mid-Atlantic. Our risk assessment study has not only found PD symptomatic vines beyond the modeled boundary for infection, confirmed Xf-positive with DAS-ELISA, but we have also found vine loss in regions considered moderate to low risk. Yellow sticky traps were used to survey Virginia vineyards throughout the 2006 and 2007 growing seasons to identify Cicadellid species in six growing regions. *Graphocephala versuta* Say and *Oncometopia orbona* Fabricius (Hemiptera: Cicadellidae) were trapped in the greatest abundance and were both present in every region surveyed.

APPENDIX D

Tuesday Morning

Fruit Symposium Abstracts

8:05 The golden era of applied entomology is coming

Charles Vincent, Noubar J. Bostanian, and Jacques Lasnier, Agriculture & Agri-Food Canada, Saint-Jean-sur-Richelieu, Québec

The advent of chemical pesticides marked a new and welcome era in agriculture. Powerful and inexpensive insecticides allowed insect control with minimal expertise. Like any technology, insecticides have their advantages and limits. Almost 50 years after their mass marketing, FQPA re-examined legal rules governing the use of pesticides in the USA. In this paper, we argue that the golden era of applied entomology is coming as a result of legal restrictions of some products. These restrictions will force the agricultural industry to adopt or develop alternative management technologies that imply more know how and knowledge for their implementation. Several examples will illustrate our points.

APPENDIX E

Tuesday Morning

Submitted Paper Abstracts

8:36 **A simple method for estimating ecosystem sustainability**

Mark W. Brown, USDA ARS, Appalachian Fruit Research Station, Kearneysville, WV and Greg Krawczyk, Department of Entomology, The Pennsylvania State University, Fruit Research and Extension Center, Biglerville, PA

Developing sustainable agricultural production systems is a current priority but quantifying the degree of sustainability is difficult. In a study evaluating the impact of compost mulch in orchards the ratio of the total number of predators to herbivores collected in pitfall traps appeared to be an easy to use index of sustainability. We tested the ratio of predators to herbivores in pitfall traps and limb jarring samples in orchards under different pest management strategies in Pennsylvania and West Virginia in 2007. The ratio of predators to herbivores may be useful as an easy to measure index of sustainability.

8:48 **Development and evaluation of spatial sampling plans for mapping insect distributions**

Yong-Lak Park, Entomology Program, Division of Plant and Soil Sciences, West Virginia University, Morgantown, WV

Spatial sampling is a core part of pest management when decision making in pest control is based on spatial distribution of pests. Previous studies suggested that a major obstacle for growers to adopt the site-specific pest management was the high sampling cost required to generate distribution maps of pests. High costs for spatial sampling are generally caused by the need of more samples to be taken compared with non-spatial sampling. In this study, spatial sampling plans for *Diabrotica* spp. (Coleoptera: Chrysomelidae) were developed and the economics of spatial sampling plans were evaluated by comparing sampling costs for spatial and non-spatial sampling plans. Spatial analysis by distance indices (SADIE) and geostatistics were used to characterize spatial distribution of *Diabrotica* spp. and geographic information system was used to generate spatial sampling plans. Sampling costs for spatial sampling plans linearly increased as the sampling distance decreased and exponentially increased as the field size increased. Although sampling costs for non-spatial sampling plans were generally lower, spatial sampling plans could be more economical when the mean insect density became lower and the field size became smaller. This study demonstrated that spatial sampling plans could be optimized to minimize the sampling costs and maximize the spatial resolution.

10:48 **Role of the gut microbial community in cellulose digestion by Asian longhorned beetle, *Anoplophora glabripennis***

Scott Geib and Kelli Hoover, Department of Entomology, The Pennsylvania State University, University Park, PA

For insects that feed on nutrient-poor food sources (e.g. wood, blood, plant xylem) gut microbiota are thought to be important to acquire the necessary nutrition to grow and develop. Beneficial roles of gut microbiota include, but are not limited to nitrogen fixation, lignocellulose degradation, uric acid degradation, fermentation and methanogenesis. These are developed into a tritrophic interaction where the microbiota play critical roles in allowing the insect overcome structural and chemical barriers in their host. Few studies have examined microbial symbionts in cerambycids. In the beetle species examined to date that harbored bacteria, a broader diversity of gut microbes was associated with broader tree host range. In the Asian longhorned beetle broad diversity of bacteria was found in the gut of insects feed on willow trees in China, while the linden borer (*Saperda vestita*), a cerambycid with a more restricted host range, contained only a small subset of these same bacteria. This leads to questions about the role of the microbial community in host range and host suitability and the multitrophic interactions present. The purpose of this study was to understand correlations between host tree species, gut microbial community, and cellulose digestion in the Asian longhorned beetle (*Anoplophora glabripennis*). Microbial communities and cellulase activity were compared between a preferred host (sugar maple, *A. saccharum*), an alternative host (pin oak, *Quercus palustris*), and a third tree species that is highly resistant to ALB (callery pear, *Pyrus calleryana* cv. *Aristocrat*) to elucidate relationships between host tree suitability and gut community complexity.

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