

**NORTH CENTRAL BRANCH
Entomological Society
of America**

March 24-27, 2008

Richard Weinzierl, NCB President



Hyatt Regency Columbus
350 North High Street
Columbus, OH 43215

Annual Meeting Sponsors

The North Central Branch ESA sincerely thanks our Annual Meeting sponsors from industry and academic institutions. Your contributions are welcome and essential to our maintaining a high-quality program. A list of contributors to the 2008 meeting is available at the registration desk and is prominently posted at refreshment breaks and in the poster room.

Meeting Logo

The meeting logo was designed by Glené Mynhardt, a graduate student at The Ohio State University. The design features the State Insect of Ohio, the Convergent Lady Beetle (*Hippodamia convergens*), perched on a leaf in the shape of Ohio. The leaf is aphid-free, as it should be.

Contents

Meeting Logistics	2
2007-08 NCB Officers and Committees	4
Special Events	6
Hotel Layout.....	7
2008 NCB Award Recipients	8
Program	16
Monday, March 24, 2008.....	16
Tuesday, March 25, 2008.....	17
Wednesday, March 26, 2008.....	39
Thursday, March 27, 2008.....	60
Author Index	64
Taxonomic Index	72
Keyword Index	76

Registration

All participants and attendees must be registered and badges are required for admission to all sessions and other functions. The registration area is centrally located in the Hayes Foyer. Registration will be open at the following times:

Monday	12:00 PM – 6:00 PM
Tuesday	8:00 AM – 5:00 PM
Wednesday	8:00 AM – 12:00 PM and 1:30 PM – 5:00 PM
Thursday	8:00 AM – 10:30 AM

Messages, Program Changes, Lost & Found

A message board is available in the poster display room (Harrison). Notices regarding program changes should be submitted to the A/V room (Grant). We will attempt to post last-minute changes on the easels outside each meeting room. Lost and found will be at the registration desk.

Spouses and Guests

There is no organized spouse/guest program. Information about attractions in the Columbus area will be available at a table in the registration area where a person will be available each morning to answer your questions.

Employment Opportunity Center

Folders will be provided on a table in the poster display room for submission of resumes, and a poster board will be available for posting of job opportunities and contact information.

Audio/Visual Equipment

The Grant Room will serve as A/V headquarters. It will be open Monday 5:00 PM – 9:00 PM, Tuesday and Wednesday 8:00 AM – 5:00 PM (except during lunch Wednesday) and Thursday 8:00 AM – noon. All meeting rooms will be equipped with an LCD projector and laptop computer.

All computers will be PCs, and presenters who use Macintosh computers/Operating Systems should pre-test their presentations for compatibility on a PC in advance. PowerPoint presentations should be brought to the meeting on a flash drive or CD-ROM, and should be brought to the A/V room as soon as possible after you arrive, and at least 24 hours before your talk (note open hours of A/V room). Timers and pointers for moderators will be available in the A/V room. Computers for presentations will be handled exclusively by the A/V Committee.

Guidelines for Speakers and Moderators

Speakers and moderators will follow standard practice at professional meetings. Moderators and speakers are both responsible for maintaining the printed schedule for starting and ending presentations. Please be considerate.

Posters – Setup, Removal, When Authors Should Be Present

Posters will be displayed in the Harrison Room. Posters may be set up Monday 4:00 PM - 8 :00 PM and Tuesday 7:00 -9:00 PM. Posters should be removed by 7:00 PM Tuesday and 6:00 PM Wednesday. Posters remaining after 6:00 PM Wednesday might be discarded as we need to vacate the Harrison Room. Presenters are requested to be at their posters Tuesday 4:00 PM – 5:00 PM and Wednesday 3:00 PM – 4:00 PM. Presenters should bring push pins. Our poster boards are not Velcro-compatible. (We apologize for the unusual size (5 ft x 3 ft) of the poster boards and the fact that your poster may droop down a bit as a result. Very recently our intended vendor pulled out of what we had understood to be an agreement.)

2007-2008 ESA NCB Officers and Committees

President: Richard Weinzierl

President-Elect: Steve Yaninek

Past President: Gary Hein

Secretary-Treasurer: David Ragsdale

Governing Board Representative: Larry Charlet

Executive Committee Members-at-Large: Mark Boetel, Shripat Kamble, Matthew O'Neal

Program Planning Committee: Kelly Estes and Celeste Welty, Co-Chairs, and John VanDyk

Local Arrangements Committee: David Horn (Chair), Roz Horn (hospitality), Claudia Kuniyoshi, Glené Myrhardt, Phil Otienoburu, Christopher Ranger, Celeste Welty

Nominating Committee: Paula Davis (Chair), Robert O'Neil, Kenneth Haynes

Auditing Committee: Ed King (Chair), Robert Wright, Thomas Phillips

Student Awards Committee: Luis Cañas and Janet Knodel (Co-Chairs), Jon Babcock, Lyric Bartholomay, Laura Campbell, Tom Clark, Catherine Hill, Elizabeth Owens, Doug Richmond.

NCB Honorary Awards Committee (for the C. V. Riley

Award and the NCB Award of Merit): Kevin Steffey and Michelle Smith (Co-Chairs), James Bing, Casey Burks, Marion Harris, Lance Meinke, Tederson Galvan

National ESA Awards Committee: Christian Krupke and Rick Foster (Co-Chairs), Mike Brewer, Sharon Dobesh, Christopher Ranger, Neil Spomer, Kelly Tilmon,

Membership Committee: Larry Olsen (Chair), Bill Hutchinson, Daniel Pavuk, Nicholas Storer

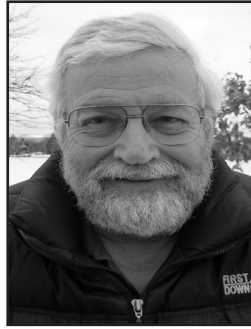
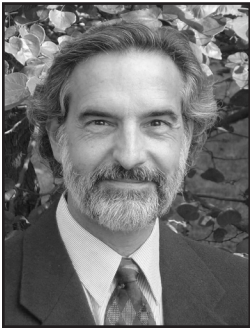
Photo Salon Committee: Tom Myers (Chair), Ric Bessin, Gary Hein, Jim Mertins, Phil Sloderbeck, David Voegtlin

Student Affairs Committee: David Coyle (Chair), Laura Campbell, Tederson Campbell, Alana Jacobsen, Ann Ray

Linnaean Games: Wyatt Hoback (Chair), Michael Culy, Jay Mcpherson, Blair Siegfried

NCB-ESA Website: (<http://esa.ent.iastate.edu>) John VanDyk, Webmaster

2007-2008 ESA NCB Meeting Organizers



Richard Weinzierl, President, and David Horn, Local
Arrangements Chair



Kelly Estes and Celeste Welty, Program Co-Chairs

Special Events

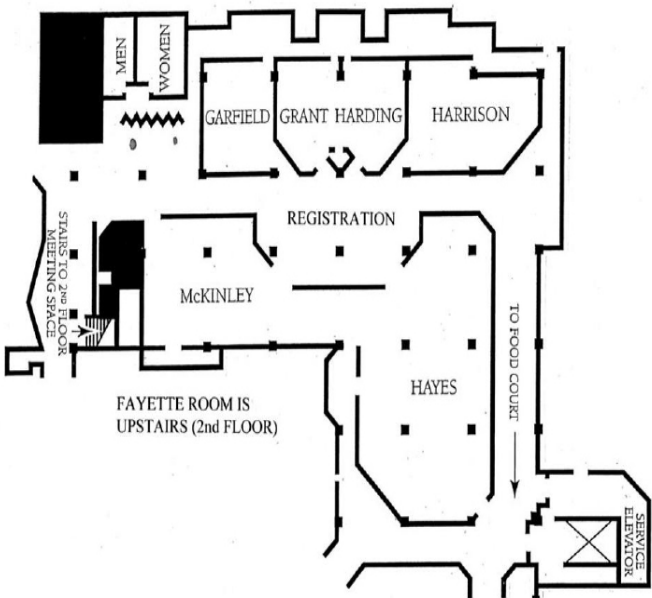
Awards Luncheon
Wednesday 12:00 PM – 1:30 PM
Hayes

In 2008 the NCB-ESA will return to our traditional Awards Luncheon. Admission is included in your registration. A vegetarian option will be available; please ask your server. The Branch will recognize award winners, the championship Linnaean Games team, and the many people who serve the North Central Branch and the ESA.

Two Mixers
Tuesday 8:30 PM – 10:00 PM
McKinley
Wednesday 6:30 PM – 8:30 PM
Hayes

The traditional “Branch Mixer” will be held following the Linnaean Games on Tuesday. Light snacks and a cash bar will be available as we mingle with new and old colleagues. On Wednesday evening there will again be a chance to mix and visit while joining in another NCB tradition, the annual Linnaean Games Challenge Match between the champions and the old-timers. To be sure, today’s students know a lot, but do not discount the wisdom and craftiness of the geezer! Once again, a cash bar and light refreshments will be available.

Hyatt Regency Hotel



2008 North Central Branch C.V. Riley Award

**Richard Merritt
Michigan State
University**



The C.V. Riley Award recognizes outstanding contributions to the science of entomology. This year's award winner is Dr. Richard Merritt.

During his 34-year career at Michigan State University, Dr. Richard Merritt has developed an outstanding, internationally-known research program focusing on aquatic entomology, medical entomology, and forensic science. In addition to conducting research, Dr. Merritt has trained 32 graduate students, and he annually teaches courses focusing on aquatic insects, insect ecology, bio-monitoring of streams, and forensic entomology. His classic textbook, 'An Introduction to the Aquatic Insects of North America', coauthored with Dr. Ken Cummins, continues to be used as a reference by thousands of students and researchers.

Dr. Merritt is one of nine original Board Certified Forensic Entomologists in the United States. He is frequently consulted in criminal cases across the U.S. and Canada, and several of his cases have been featured in documentaries. In 2002, Dr. Merritt was elected Chair of the Entomology Department at MSU. In addition to serving as chair, he has maintained a full research and teaching program with five graduate students and projects in Michigan, California, and Alaska, as well as a study elucidating insect transmission of *Buruli ulcer* in Africa.

2008 North Central Branch Award of Merit

**Larry Charlet
USDA-ARS**



The North Central Branch Award of Merit recognizes outstanding contributions to the Branch based on continued superior service.

Dr. Larry Charlet has been a research entomologist with the USDA-ARS in Fargo, ND, for 29 years, and he has been a member of ESA since 1972. His service within the branch and to ESA overall has indeed been exemplary.

Dr. Charlet has served in numerous roles, including Vice President and President, for the Nearctic Section of the International Organization for Biological Control; he also is a member of the North Central Regional Committee on the Biological Control of Arthropods and Weeds. He has served as the North Central Branch representative for ESA's Standing Committee on Membership, Section C representative on the Editorial Board for Arthropod Management Tests and Thomas Say Publications, and member, Chair, and Governing Board Liaison for the Publications Council. He has served as Chair of Subsection Ca and is currently the Governing Board Liaison for the ESA Awards and Recognition Committee. He has served on the NCB Meeting Time and Location Selection Committee, Local Arrangements Committee, Program Committee, Award of Merit Committee, and Membership Committee and was Program Chair for the 2004 meeting in Kansas City. He is serving a second term as the North Central Branch representative to the ESA Governing Board and is a member of the Presidential Committee on ESA Publications.

2008 North Central Branch Graduate Student Scholarship Award

Ann Marie Ray University of Illinois



The 2008 NCB Graduate Student Scholarship Award winner is Ann Marie Ray, a Ph.D. candidate at the University of Illinois. She is advised by Dr. Lawrence Hanks. Annie is currently working on the evolution of volatile pheromone use in cerambycine longhorned beetles. Her PhD research is providing critical support for the proposed association between pheromone production and cuticular gland pores present on pheromone-producing species. She is also working on the molecular phylogeny of the group.

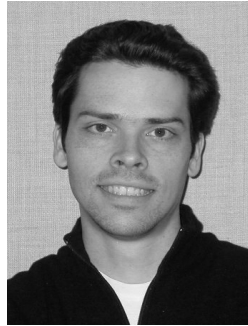
In addition to being an excellent researcher with several peer-reviewed publications that are highly cited by those doing research on cerambycid pheromones, Annie is an excellent teaching assistant. As recognition for her teaching abilities, she has earned a place on the List of Teachers Rated Excellent by Their Students at the University of Illinois. Her leadership has also been recognized by her peers, as she has served as president of the Entomology Department Graduate Student Association. Her volunteer work is highly regarded and includes participation in the University of Illinois Insect Fear Festival and public service with groups such as the Girl Scouts. Annie is singlehandedly responsible for the University of Illinois Entomology Department's involvement in "Bugscope", a project run by the Beckman Institute's Imaging Technology Group that allows free interactive access for the general public to a scanning electron microscope.

Annie Ray is demonstrating that she is becoming not only a well regarded scientist but also an outstanding teacher, leader, and citizen.

2008 North Central Branch J.H. Comstock Award

Jeffrey Bradshaw

The 2008 NCB Comstock Award winner is Dr. Jeff Bradshaw. Jeff recently received his Ph.D. from Iowa State University in Entomology and Plant Pathology. He was co-advised by Dr. Marlin Rice and Dr. John Hill.



Jeff's research involved work on the bean leaf beetle, *Cerotoma trifurcata* (Chrysomelidae), and Bean pod mottle virus (BPMV) biology and management. He also used various molecular tools to identify and sequence a novel partial-diploid strain of BPMV from *Desmodium illinoense* (Fabaceae), a potential reservoir host for BPMV. This work has resulted in peer reviewed and extension publications that have received numerous awards and recognitions. Jeff has been presenting the recommendations derived from his research, and he has been author/co-author of 41 scientific presentations (17 invited) at branch and national meetings of the ESA, the National IPM Symposium, and American Phytopathological Society, as well as two international symposia. In addition, he has authored or co-authored 27 extension publications.

Jeff also has shown excellence as a teaching assistant in a study-abroad class titled "Natural History of the Serengeti," a 2½-week course in which students observed and recorded mammal, bird, and insect behavior in northern Tanzania. Jeff incorporated several arthropod experiences into the course, including blacklighting for scorpions, close encounters with safari ants, and termite mound observations.

Because of his excellence in research, teaching, and extension, we acknowledge Jeff's overall effort with the 2008 NCB Comstock Award.

ESA-NCB Award of Excellence in Integrated Pest Management

**James Miller
Michigan
State University**



The 2008 ESA-NCB Award of Excellence in Integrated Pest Management goes to Dr. James Miller of Michigan State University.

Dr. Miller grew up on a farm in Lancaster, Pennsylvania. He earned a B.A. in Biology from Millersville University in 1970 and a Ph.D. in Entomology from Penn State University in 1975. After a 2 yr. post-doctoral position at Cornell University's Geneva Agricultural Experiment Station, he joined the Entomology faculty at Michigan State University in 1977, where he recently became a Distinguished Professor.

Dr. Miller's wide-ranging research has focused on insect-plant interactions, insect chemical ecology, and malaria mosquito management. He teaches Insect Behavior, Insect Physiology, and Nature and Practice of Science. Dr. Miller is a subject editor (Behavior) for Environmental Entomology.

ESA-NCB Recognition Award in Entomology

Douglas Landis
Michigan
State University



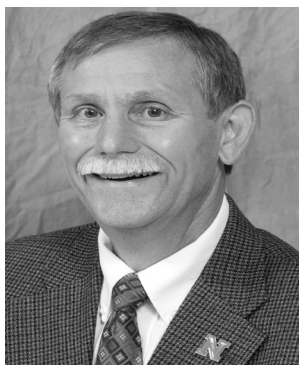
Dr. Doug Landis received his B.A. in Biology from Goshen College in 1981 and his M.S. and Ph.D. in Entomology from North Carolina State University in 1984 and 1987. He joined the Department of Entomology at Michigan State University in 1988, and he is now a Professor there, with research and teaching responsibilities in insect ecology and biological control of invasive species.

Much of Dr. Landis' work focuses on the role of landscape structure in shaping insect-insect and insect-plant interactions. His current research projects include biological control of soybean aphid and garlic mustard, the use of native plants to enhance beneficial insects, and conservation of insects in fire-dependent ecosystems.

Dr. Landis is co-director of MSU's Invasive Species Initiative. In this role he advises state and federal agencies on invasive species management.

ESA-NCB Distinguished Achievement Award in Extension

Fred Baxendale University of Nebraska



Dr. Frederick P. Baxendale is a Professor and Extension Specialist in the Department of Entomology at the University of Nebraska-Lincoln. He completed his Ph.D. and M.S. degrees in entomology at Texas A&M University, and earned his B.S. degree in entomology at Cornell. His extension responsibilities include programming for turfgrass and horticultural entomology, urban pest management, 4-H and youth entomology, and forensic entomology. He also has served as a panelist on the popular, long-running Backyard Farmer television program (now entering its 55th season) since 1985.

Dr. Baxendale is widely recognized for his expertise in the environmentally responsible management of turfgrass insect pests, and he is a leading authority on the insects and mites on buffalograss. His research focuses on the development of IPM strategies for insects affecting turfgrasses, native grasses, and horticultural plantings. He has authored over 300 extension and research publications and has secured more than \$2.75 million in competitive and grant-in-aid funding to help support his extension and applied research programs.

Dr. Baxendale has been the recipient of numerous awards for excellence in extension programming, including the Nebraska Cooperative Extension Association's Outstanding New Specialist Award, Nebraska Cooperative Extension Team Awards for Backyard Farmer and Urban Pest Management, ESA Recognition Award in Urban Entomology, and the Excellence in Extension Award presented by the National Association of State Universities and Land-Grant Colleges.

ESA-NCB Distinguished Achievement Award in Teaching

Tiffany Heng-Moss University of Nebraska



Dr. Tiffany Heng-Moss, an associate professor at the University of Nebraska-Lincoln, has developed seven undergraduate and graduate courses while providing leadership for development of a new undergraduate major in Insect Science. Her introductory Insect Biology course was the first distance-delivered concurrent credit course offered as part of the University of Nebraska Advanced Scholars Program. She is also a member of the plant protection science, professional golf course management, and forensic science curriculum committees. She serves as an advisor to several university student organizations and mentors undergraduate students conducting research in entomology. She is the department's undergraduate research coordinator and chair of the departmental curriculum committee.

Dr. Heng-Moss provides program leadership for outreach activities such as "Our Zoo to YOU," which has been presented to more than 2,500 students in 85 Nebraska classrooms over the past 5 years, and has secured over \$250,000 in competitive grant support. She is a major contributor and organizer for an annual Bug Bash educational program at the Lincoln Children's Zoo with the Lincoln Public Schools Science Focus Program.

Dr. Heng-Moss has received several awards, including the USDA Regional Award for Excellence in College and University Teaching in the Food and Agricultural Sciences. She has received Certificates of Recognition from the UNL Parents Association and Teaching Council, the Holling Family Junior Faculty Award for Teaching Excellence, and the Omtvedt Innovation Award from the UNL Institute of Agriculture and Natural Resources. She is a Fellow of the Center for Great Plains Studies at UNL.

SCHEDULE

Monday, March 24, 2008

NCB Executive Committee Meeting

2:00 PM – 5:00 PM

Grant

Registration

12:00 PM – 6:00 PM

Hayes Foyer

Upload Presentations

5:00 PM – 9:00 PM

Grant

Poster Setup

4:00 PM – 8:00 PM

Harrison

Acarology Workshop

2:00 PM – 6:00 PM

OSU Campus

OSU Entomology Tour

3:00 PM – 5:00 PM

OSU Campus

Photo Salon

6:00 PM – 7:00 PM

McKinley

Preliminary Linnaean Games

7:00 PM – 9:00 PM

Gamemaster: W. Wyatt Hoback
University of Nebraska at Kearney
Hayes



SCHEDULE

Tuesday, March 25, 2008

Registration

8:00 AM – 5:00 PM

Hayes Foyer

Upload Presentations

8:00 AM – 5:00 PM

Grant

Opening Session

8:00 AM – 10:00 AM

Hayes

B.S./M.S. Student Competition Papers

10:15 AM – 12:00 PM

Garfield

Harding

Ph.D. Student Paper Competition

10:15 AM – 12:00 PM

Madison

Fayette

Student Competition Poster Session

7:00 AM – 5:00 PM

authors present 4:00 PM – 5:00 PM

Harrison

Program Symposium

At the Forefronts of Entomology

1:15 PM – 5:00 PM

Hayes

BCE Symposium

Urban IPM Thrills

1:15 PM – 5:15 PM

McKinley

**Technology Transfer in the 21st Century:
Challenges & Opportunities**

Tuesday, March 25, 2008

1:15 PM – 5:00 PM

Garfield

Photo Salon

6:00 PM – 7:00 PM

McKinley

Submitted Poster Setup

7:00 PM – 8:00 PM

Harrison

Linnaean Games Final

7:00 PM – 9:00 PM

Gamemaster: W. Wyatt Hoback
University of Nebraska at Kearney
Hayes

Branch Mixer

(to follow Linnaean Games)

McKinley



PROGRAM

Tuesday, March 25, 2008

Opening Session

Tuesday, March 25, 2008

8:00 AM – 10:00 AM

Hayes

Call to Order

Richard Weinzierl, President
North Central Branch
Entomological Society of America

Local Arrangements Update

David Horn

Program Update

Kelly Estes and Celeste Welty

Messages from ESA Central

Michael Gray, ESA President
Robin Kriegel, ESA Executive Director
Larry Charlet, ESA Governing Board Representative

Putting ESA's New Sections to Work -- A View for Plant Insect Ecosystems

Robert Wiedenmann

Updates from the Entomological Foundation

Michelle Smith

BCE-ACE Message

Mitch Meehan

NCB President's Address

Richard Weinzierl

Preliminary Business Meeting

B.S./M.S. Student Competition Papers

Tuesday, March 25, 2008

10:15 AM – 12:00 PM

Garfield

Moderator:

Steve Yaninek

Purdue University

West Lafayette, IN

- 10:15 001 Laboratory Investigations of Ladybird Beetle Behavior: Experiments to Develop Teaching Exercises
Jason M. Gfeller and W. Wyatt Hoback, University of Nebraska, Department of Biology, Kearney, NE
- 10:27 002 The Diversity and Activity Patterns of Carabid Beetles and Slugs in Strawberry Agroecosystems
Michael J. Eskelson, John J. Obrycki, Doug D. Archbold, and James D. Harwood, University of Kentucky, Department of Entomology, Lexington, KY
- 10:39 003 Aphid Pests and their Natural Enemies in Organic and Conventional Soybean and Alfalfa Fields
Rachel E. Mallinger and David B. Hogg, University of Wisconsin, Department of Entomology, Madison, WI
- 10:51 004 The Interaction of Soybean Aphid and Soybean Cyst Nematode: Response of Several Resistant and Susceptible Soybean Varieties
Joshua R. Heeren, Nicholas A. Tinsley, Ronald E. Estes, Michael E. Gray, Terry L. Niblack, Kevin L. Steffey, and Jared B. Schroeder, University of Illinois, Department of Crop Sciences, Urbana, IL; Matthew O'Neal, Gregory Tylka, and M. Felicitas Avendano, Iowa State University, Ames, IA

- 11:03 005 PCR Analysis to Quantify a Mechanism by which a Beetle Species Vectors a Bacterial Plant Pathogen
Robert F. Mitchell and Lawrence M. Hanks, University of Illinois, Department of Entomology, Urbana, IL
- 11:15 006 Chemically-Mediated Mate Recognition in the Primitive Longhorned Beetle *Mallodon dasystemus* (Say)
Annie E. Spikes, Purdue University, West Lafayette, IN, Nathan M. Schiff, USDA-Forest Service, Southern Hardwoods Laboratory, Stoneville, MS, and Matthew D. Ginzel, Purdue University, West Lafayette, IN



M.S. Student Competition Papers

Tuesday, March 25, 2008

10:15 AM – 12:00PM

Harding

Moderator:

Richard Weinzierl

University of Illinois

Urbana, IL

- 10:15 007 The Behavior of Flour Beetles in Flour Mills and in Laboratory Settings
Karen J. Hawkin, University of Manitoba, Department of Entomology, Manitoba, Canada, Paul G. Fields, Agriculture and Agri-Food Canada, Cereal Research Centre, Winnipeg, Canada, and Dean Stanbridge, The Steritech Group Corp., Milton, Ontario, Canada
- 10:27 008 Comparative Residual Efficacies of Aerosol Insecticides Against Two *Tribolium* Species
April E. Sutton, Kansas State University, Department of Entomology, Manhattan, KS, Frank H. Arthur, and James F. Campbell, Grain Marketing and Production Research Center, USDA/ARS, Manhattan, KS, and Kun Yan Zhu, Kansas State University, Department of Entomology, Manhattan, KS
- 10:39 009 New State Records for *Lutzomyia shannoni* (Dyar) and *Lu. vexator* (Coquillett)
Logan M. Minter, University of Kentucky, Lexington, KY, Brian W. Kovacic, Lexington, KY, David C. Claborn, Uniformed Services University, Bethesda, MD, David A. Florin, US Naval Medical Research Center Detachment, NMRCDC, Lima, Peru, Phillip G. Lawyar, NIAID, National Institutes of Health, Bethesda, MD, and Grayson C. Brown, University of Kentucky, Lexington, KY

- 10:51 010 Revision of the African Genus *Oreiscelio* (Hymenoptera: Scelionidae)
Elijah J. Talamas and Norman F. Johnson,
The Ohio State University, Columbus, OH
- 11:03 011 Combining an Artificial Break in Brood Rearing with Oxalic Acid Treatment to Reduce *Varroa destructor* Populations
Jeremy J. Wagnitz and Marion Ellis,
University of Nebraska, Department of Entomology, Lincoln, NE
- 11:15 012 Role of Calcium and Calmodulin in the Cold Tolerance of the Antarctic Midge, *Belgica antarctica*
Nicholas M. Teets, Miami University (currently at the Ohio State University, Department of Entomology, Columbus, OH), Michael A. Elnitsky, Miami University, Department of Zoology, Oxford, OH, Joshua B. Benoit, Giancarlo Lopez-Martinez, and David L. Denlinger, The Ohio State University, Department of Entomology, Columbus, OH, and Richard E. Lee, Jr., Miami University, Department of Zoology, Oxford, OH
- 11:27 013 Lure and Kill – A Novel Approach to Controlling Japanese Beetles
Elizabeth E. Morris and Parwinder S. Grewal, The Ohio State University, OARDC, Wooster OH



Ph.D. Student Competition Papers

Tuesday, March 25, 2008

10:15 AM – 12:00 PM

Madison

Moderator:

Larry Charlet

USDA-ARS

Fargo, ND

- 10:15 014 Densities of Common Nebraska Rangeland Grasshoppers (Orthoptera: Acrididae) Differ Between Ecoregions
Mathew L. Brust, University of Nebraska, Lincoln, NE, W. Wyatt Hoback, University of Nebraska, Kearney, NE, and Robert J. Wright, University of Nebraska, Lincoln, NE
- 10:27 015 Soybean Aphid (*Aphis glycines*) Management; The Importance of Insecticide Coverage
Kevin D. Johnson and Matthew E. O'Neal, Iowa State University, Department of Entomology, Ames, IA
- 10:39 016 Quantifying Exposure Pathways in Carabid Food Webs: Uptake of Bt-Endotoxins from Multiple Transgenic Events
Julie A. Peterson, John J. Obrycki, and James D. Harwood, University of Kentucky, Lexington, KY
- 10:51 017 Insect-Host Phenological Synchrony: Foliar Terpenes and Free Amino Acids in Relation to European Pine Sawfly Life Cycle
Rodrigo A. Chorbadjian and Daniel A. Herms, The Ohio State University, Ohio Agricultural Research and Development Center, Wooster, OH

- 11:03 018 Resistance Mechanisms of Paper Birch Against Bronze Birch Borer
Vanessa L. Muilenburg, The Ohio State University, OARDC-Dept. of Entomology, Wooster, OH, Pierluigi Bonello, The Ohio State University, Columbus, OH, Daniel A. Herms, The Ohio State University, OARDC-Dept. of Entomology, Wooster, OH
- 11:15 019 The Amino Acid Composition of Poinsettia Cultivars: Effects on Silverleaf Whitefly Life History
Karla J. Medina-Ortega and Luis A. Cañas, The Ohio State University, Wooster, OH
- 11:27 020 Characterizing Effectiveness of Structural Heat Treatments Against Insects in Three Commercial Facilities
Fernanda N. Lazzari, Bhadriraju Subramanyam, and Xingwei Hou, Kansas State University, Manhattan, KS
- 11:39 021 Termite Mediated Alteration of Food Items.
Nicola T. Gallagher and Susan C. Jones, The Ohio State University, Columbus, OH



Ph.D. Student Competition Papers

Tuesday, March 25, 2008

10:15 AM – 12:00 PM

Fayette

Moderator:

Fred Baxendale

University of Nebraska-Lincoln

Lincoln, NE

- 10:15 022 Elucidating Problematic Hymenopteran Relationships using Novel Genes
Kacie J. Johansen, Barb Sharanowski, and Michael Sharkey, University of Kentucky, Department of Entomology, Lexington, KY
- 10:27 023 Founding Stage of *Lasius (Acanthomyops)*
Joseph M. Raczkowski, The Ohio State University, Columbus, OH
- 10:39 024 Identification and Expression Profiles of Thirteen Glutathione S-transferase Genes from the European Corn Borer
Chitvan Khajuria, Kansas State University, Department of Entomology, Manhattan, KS, Yu-Cheng Zhu, USDA-ARS-JWDSRC, Stoneville, MS, and Lawrent L. Buschman, Ming-Shun Chen, and Kun Yan Zhu, Kansas State University, Manhattan, KS
- 10:51 025 Mineralization of [14C] Indoxacarb in Soils Around Urban Structures
Neil A. Spomer and Shripat T. Kamble, University of Nebraska, Lincoln, NE, and Clay W. Scherer and Mark A. Coffelt, DuPont Corp., Wilmington, DE
- 11:03 026 Moisture Requirements of Three Species of Antarctic Mites and the Seabird Tick
Joshua B. Benoit, The Ohio State University, Columbus, OH, Jay A. Yoder, Wittenberg University, Springfield, OH, Giancarlo Lopez-Martinez, The Ohio State University, Columbus, OH, Michael A.

Elnitsky and Richard E. Lee, Jr., Miami University, Oxford, OH, and David L. Denlinger, The Ohio State University, Columbus, OH

- 11:15 027 Overhydration and Dehydration of the Antarctic Midge, *Belgica antarctica*, Leads to Upregulation Stress Reduction Genes
Giancarlo Lopez-Martinez and Joshua B. Benoit, The Ohio State University, Columbus, OH, Michael A. Elnitsky and Richard E. Lee, Jr., Miami University, Oxford, OH, and David L. Denlinger, The Ohio State University, Columbus, OH
- 11:27 028 Rapid Cold Hardening Elicits Changes in Brain Protein Profiles of the Flesh Fly
Aiqing Li and David L. Denlinger, The Ohio State University, Columbus, OH
- 11:39 029 Use of Thermal Response to Evaluate Parasitic Recognition in Honeybees
Suresh Desai, Digvir Jayas, and Robert Currie, University of Manitoba, Department of Entomology, Winnipeg, Manitoba, Canada



Program Symposium
At the Forefronts of Entomology

Tuesday, March 25, 2008

1:15 PM –5:00 PM

Hayes

Moderators:

Richard Weinzierl

University of Illinois

Department of Crop Sciences

Urbana, IL

and

Susan Weller

University of Minnesota

Department of Entomology

St. Paul, MN

- 1:15 030 Welcome
Richard Weinzierl, University of Illinois,
Department of Crop Sciences, Urbana, IL
- 1:20 031 The Role of Systematics and Taxonomy in
Dealing with Invasive Mites
Hans Klompen, Museum of Biological
Diversity, The Ohio State University,
Columbus, OH
- 1:45 032 Systematics and Bioinformatics in the
21st Century
Susan Weller, University of Minnesota,
Department of Entomology, St. Paul, MN
- 2:10 033 The Emerald Ash Borer Invasion: the
Beginning of the End of Ash in North
America
Daniel Herms, The Ohio State University,
OARDC, Wooster, OH
- 2:35 034 Periodical Cicadas: New Discoveries and
New Predictions
Gene Kritsky, College of Mount St.
Joseph, Department of Biology,
Cincinnati, OH

- 3:00 **BREAK**
- 3:15 035 Mating Disruption for Fruit Insect Management in Eastern North America
Larry Gut, Michigan State University, Department of Entomology, East Lansing, MI
- 3:40 036 Using Evolutionary and Ecological Functional Genomics to Understand Adaptation in Agronomic Crop Pests
Andrew Michel, The Ohio State University, Department of Entomology, Wooster, OH
- 4:05 037 Is There a Limit to What IPM Can Contribute to Increasing Pest Pressure in North Central U.S. Field Crop Production?
Matthew O'Neal, Iowa State University, Department of Entomology, Ames, IA
- 4:30 038 Complementarity: The Missing Link in Web and Print Delivery of IPM Course Content
Edward B. Radcliffe, University of Minnesota, Department of Entomology, St. Paul, MN, William D. Hutchison, University of Minnesota, Department of Entomology, St. Paul, MN, and Rafael E. Cancelado, Bogotá, Colombia
- 4:55 Discussion



**BCE Symposium:
Urban IPM Thrills**

Tuesday, March 25, 2008
1:15 PM –5:15 PM
McKinley

Organizers and Moderators:

Changlu Wang

Purdue University
Department of Entomology
West Lafayette, IN

and

Shripat T. Kamble

University of Nebraska
Department of Entomology
Lincoln, NE

- 1:15 039 Introduction
Shripat T. Kamble, University of
Nebraska, Department of Entomology,
Lincoln, NE
- 1:20 040 Bed Bug Resistance: Updates on the
Lethal and Sublethal Effects of
Insecticides on the Bed Bug, *Cimex*
lectularius L.
Alvaro Romero, Michael F. Potter, and
Kenneth F. Haynes, University of
Kentucky, Department of Entomology,
Lexington, KY
- 1:45 041 Integrated Pest Management
Approaches for Subterranean Termites
Susan Jones, The Ohio State University,
Department of Entomology, Columbus,
OH
- 2:10 042 Residential IPM: Why We Should Adopt
It?
Changlu Wang, Purdue University,
Department of Entomology, West
Lafayette, IN

- 2:35 043 Pest Private Eye: An Interactive Video Game About Pests and IPM
Clyde Ogg, Erin Bauer, Melanie Eirich, Vishal Singh, Nino Kapetanovic, and Heather Dahm, University of Nebraska, Lincoln, NE
- 3:00 044 Future of Going Green in Urban IPM
Pari Pachamuthu, Western Exterminator Company, Sacramento, CA
- 3:25 **BREAK**
- 3:35 045 Bringing IPM into Stored Product Pest Management
Linda Mason, Purdue University, Department of Entomology, West Lafayette, IN
- 4:00 046 Itchin' for Answers: *Pyemotes* Mites in the Midwest
Frederick P. Baxendale and James A. Kalisch, University of Nebraska, Department of Entomology, Lincoln, NE
- 4:25 047 New Label Directions for Use and Efficacy Data for Termidor Termiticide-Insecticide for Subterranean Termite and Perimeter Pest Control in the United States and Use Within the Principles of Integrated Pest
Robert W. Davis, BASF Specialty Products, Pflugerville, TX
- 4:50 048 Nuisance Ant Management - A Thrilling Story
Shripat T. Kamble, Timothy Husen, and Neil Spomer, University of Nebraska, Department of Entomology, Lincoln, NE



Technology Transfer in the 21st Century: Challenges and Opportunities

Tuesday, March 25, 2008

1:15 PM – 5:00 PM

Garfield

Organizers:

Ayanava Majumdar

North Dakota State University

Extension Service

Finley, ND

and

Janet Knodel

North Dakota State University

Department of Entomology

Fargo, ND

and

Patrick Beauzay

North Dakota State University

Department of Entomology

Fargo, ND

Moderator:

Janet Knodel

North Dakota State University

Department of Entomology

Fargo, ND

- | | | |
|------|-----|---|
| 1:15 | 049 | Opening Remarks, Historical Perspectives of Technology Transfer
Janet Knodel , North Dakota State University, Department of Entomology, Fargo, ND |
| 1:45 | 050 | Role of Extension Entomology in Technology Transfer
Kevin Steffey , University of Illinois, Department of Crop Sciences, Urbana, IL |
| 2:15 | 051 | Grower Preference for Accessing Information: Results of an IPM Survey
Ayanava Majumdar , North Dakota State University, Finley, ND |

2:45 052 Electronic Resources in Extension
Entomology
Patrick Beauzay, North Dakota State
University, Department of Entomology,
Fargo, ND

3:15 **BREAK**

3:30 053 Role of Extension Entomology in
Sustainable Agriculture
Rick Foster, Purdue University,
Department of Entomology, West
Lafayette, IN

4:00 054 Role of Extension Entomology in
Agroindustry
Mike Culy, Dow Agrosocienes LLC,
Indianapolis, IN

4:30 Panel Discussion



Student Competition Posters

Tuesday, March 25, 2008

D055 – D080

7:00 AM – 5:00 PM

authors present 4:00 PM – 5:00 PM

Harrison

B.S. Posters

Systematics, Evolution, and Biodiversity

D055 A Test of Parasitism Suitable for a Teaching Exercise

Lacey M. Keeten and W. Wyatt Hoback,
University of Nebraska, Department of Biology,
Kearney, NE

Plant-Insect Ecosystems

D056 Host Plant Selection Experiment Suggests a New Gall Wasp Species (Hymenoptera Cynipidae)

Tyler D. Sapp and Zhiwei Liu, Eastern Illinois University, Charleston, IL

D057 Ecological Effects of the Installation of an Underground Oil Pipeline on Millipede Communities in Hocking County, Ohio

Monica A. Farfan and David J. Horn, The Ohio State University, Columbus, OH

M.S. Posters

Systematics, Evolution, and Biodiversity

D058 A Biodiversity Study of Arctic Diptera: Muscidae and Fanniidae of Churchill (MB)

Anaïs Renaud, University of Manitoba, Entomology Department, Winnipeg, MB,
Jade Savage, Bishop's University, Biological Sciences, Sherbrooke, QC, and Rob Roughley, University of Manitoba, Entomology Department, Winnipeg, MB

- D059 Insect Survey in Giant Cane (*Arundinaria gigantea*) Stands of Southeast Missouri
M. Anthony Maupin and Diane L. Wood,
Southeast Missouri State University, Biology
Department, Cape Girardeau, MO
- D060 Is Big Brown Bat Predation Further Endangering
the American Burying Beetle?
Roger W. Yerdon, W. Wyatt Hoback, and Keith
Geluso, University of Nebraska, Kearney, NE, and
Patricia W. Freeman, University of Nebraska,
School of Natural Resources, Lincoln, NE
- D061 Population Status and Potential Threats to the
Platte River Caddisfly (*Isonychia plattensis*)
John R. Riens and W. Wyatt Hoback, University of
Nebraska, Department of Biology, Kearney, NE

Integrative Physiological and Molecular Insect Systems

- D062 Status of Pyrethroid Resistance in Indiana and
Illinois populations of *Helicoverpa zea*
Alana L. Jacobson and Rick E. Foster, Purdue
University, West Lafayette, IN

Plant-Insect Ecosystems

- D063 Survival and Seasonal Phenology of the Soybean
Aphid in Indiana
Diana Castillo and Robert J. O'Neil, Purdue
University, Biological Control, West Lafayette, IN
- D064 Effects of Current and Future Soybean Aphid
Management
Nicholas A. Tinsley, Kevin L. Steffey, Ronald E.
Estes, Joshua R. Heeren, and Michael E. Gray,
University of Illinois, Department of Crop
Sciences, Urbana, IL
- D065 Are Soybean Aphids (Hemiptera: Aphididae)
Resistant to Insecticides in Michigan?
Desmi I. Chandrasena and Christina D. DiFonzo,
Michigan State University, Department of
Entomology, East Lansing, MI

- D066 Effect of Monsanto Corn Event 88017 and Adult Diet on Selected Western Corn Rootworm Life History Traits
Stephen T. Young and Lance J. Meinke, University of Nebraska, Lincoln, NE
- D067 The Flight Characteristics, Soil Distribution, and Seasonal Occurrence of *Curculio sayi* (Coleoptera: Curculionidae)
Ian W. Keeseey and Bruce A. Barrett, University of Missouri, Columbia, MO
- D068 A Survey of Over Wintering Insects in Pitch Pine
Sarah M. Colvin, University of Kentucky, Lexington, KY
- D069 Insemination Capacity of Male *Anopheles gambiae*
Adrea C. Rodriguez and Woodbridge A. Foster, The Ohio State University, Columbus, OH

Ph.D. Posters

Systematics, Evolution, and Biodiversity

- D070 Living with Stress: Web Architecture in the Cave Spider *Meta ovalis* (Gertsch 1933)
Meghan A. Rector and J. Andrew Roberts, The Ohio State University, Newark, OH
- D071 Mouthpart Morphology of Larval Net-Winged Midges (Blephariceridae): Intergeneric Comparisons and Phylogenetic Implications
Rebecca B. Brown and Gregory W. Courtney, Iowa State University, Ames, IA
- D072 The Handsome Fungus Beetles (Coleoptera: Endomychidae) of Wisconsin
Michele B. Price, Theresa Cira, and Daniel K. Young, University of Wisconsin, Madison, WI

Integrative Physiological and Molecular Insect Systems

- D073 Fitness Costs of Cry1Ab Resistance in Field-Derived Strain of European Corn Borer (Lepidoptera: Crambidae)
Andre B. Crespo and Terence A. Spencer, University of Nebraska, Lincoln, NE, Tederson L. Galvan, University of Minnesota, Saint Paul, MN, and Blair D. Siegfried, University of Nebraska, Lincoln, NE

Plant-Insect Ecosystems

- D074 The Impact of *Beauveria bassiana*, Bt Spray, Spinosad and *Trichogramma* on the Lepidoptera (Crambidae)
Rostern N. Tembo and Daniel M. Pavuk, Bowling Green State University, Biological Sciences Department, Bowling Green, OH
- D075 Hessian Fly Free Dates in Kansas: Is it Still Valid After 70+ Years
Erik Echegaray, Aqeel Ahmad, and Jeff Whitworth, Kansas State University, Manhattan, KS, Gary Cramer, Kansas State University, Wichita, KS, Phil Sloderbeck, and Ming-Shun Chen, Kansas State University, Manhattan, KS
- D076 Utilizing Remote Sensing Images to Track Virus-Vector Spread in Wheat
Abby R. Stilwell, University of Nebraska, Lincoln, NE, Gary L. Hein, University of Nebraska, Scottsbluff, NE, and Don C. Rundquist, University of Nebraska, Lincoln, NE
- D077 Interaction Among Planting Dates, Transgenic Corn and Seed Treatment on Corn Rootworm Damage and Corn Grain Yield
Motshwari Obopile and Ronald B. Hammond, The Ohio State University, Department of Entomology, Wooster, OH, and Peter R. Thomison, The Ohio State University, Department of Horticulture and Crop Science, Columbus, OH

- D078 Time of Removal of Newly-Diseased Elm Trees
May Reduce Transmission of Dutch Elm Disease
Spores by *Hylurgopinus rufipes*
Sunday Oghiakhe and Neil J. Holliday, University
of Manitoba, Winnipeg, Manitoba, Canada

Structural, Veterinary, and Public Health Systems

- D079 DNA Genotyping for Distinguishing Colony and
Intra-Specific Genetic Variation in Eastern
Subterranean Termites
Timothy J. Husen, Shripat T. Kamble, and Julie M.
Stone, University of Nebraska, Lincoln, NE
- D080 Effects of Sugar Availability on the Mating
Capability of *Anopheles gambiae*
Chris M. Stone, Robin M. Taylor, and Woodbridge
A. Foster, The Ohio State University, Columbus,
OH



SCHEDULE

Wednesday, March 26, 2008

Registration

8:00 AM – 12:00 PM

1:30 PM – 5:00 PM

Hayes Foyer

Genetics and Genomics of Agronomic Pests: From Populations to Individuals to Genes

8:00 AM – 11:45 AM

Garfield

Emerging and Invasive Pests of Urban Landscapes

8:00 AM – 11:45 AM

McKinley

Advances in Fruit & Vegetable IPM

8:00 AM – 11:30 AM

Madison

Submitted Papers

9:00 AM – 11:00 AM

Harding

Awards Luncheon

12:00 PM – 1:15 PM

Hayes

Student Affairs Symposium: Walking the Entomological Line: Making the Transition from Student to Professional

1:30 PM – 5:00 PM

McKinley

Exploring Plant-Mediated Outcomes in Arthropod Biological Control

1:30 PM – 5:35 PM

Garfield

Submitted Papers

2:30 PM – 3:30 PM

Harding

Submitted Posters

D143 – D162

7:00 AM – 5:00 PM

authors present 3:00 PM – 4:00 PM

Harrison

Remove Posters

5:00 PM – 6:00 PM

Harrison

Linnaean Games Winners vs. “Old-Timers”

6:30 PM – 7:00 PM

Hayes

Reception

6:30 PM – 8:30 PM

Hayes



PROGRAM

Wednesday, March 26, 2008

Genetics and Genomics of Agronomic Pests: From Populations to Individuals to Genes

Wednesday, March 26, 2008

8:00 AM – 11:45 AM

Garfield

Organizer and Moderator:

Andy Michel

The Ohio State University
Department of Entomology
Wooster, OH

- 8:10 081 Introduction.
Andy Michel, The Ohio State University,
Department of Entomology, Wooster, OH
- 8:15 082 Development of Genomic Tools to Study
European Corn Borer (*Ostrinia nubilalis*)
Brad Coates, USDA-ARS, Ames, IA
- 8:45 083 Analysis and Annotation of Gut-Specific
Transcriptomes from the European Corn
Borer (*Ostrinia nubilalis* Hubner)
Chitvan Khajuria, Kansas State
University, Department of Entomology,
Manhattan, KS
- 9:15 084 Candidate Markers for Rotation
Resistance in the Western Corn
Rootworm
Lisa M. Knolhoff, University of Illinois,
Department of Entomology, Urbana, IL,
Kimberly K. O. Walden, Susan T. Ratcliffe,
David W. Onstad, and Hugh M.
Robertson, University of Illinois, Urbana,
IL
- 9:45 **BREAK**

- 10:00 085 E Chromosomes in the Hessian Fly
(*Mayetiola destructor*)
Brandi J. Schemerhorn, USDA-ARS,
West Lafayette, IN
- 10:30 086 Southeastern U.S. Populations of Hessian
Fly, a Lesson in Genetic Variation
Phillip K. Morton, Purdue University,
Department of Entomology, West
Lafayette, IN
- 11:15 087 Genetic Variation and Range Expansion
of Western Bean Cutworm
Nicholas Miller, USDA-ARS, Ames, IA



Emerging and Invasive Pests of Urban Landscapes

Wednesday, March 26, 2008

8:15 AM – 11:45 AM

McKinley

Organizers and Moderators:

Christopher Ranger

USDA-ARS

Horticultural Insects Research Lab

Wooster, OH

and

Dave Shetlar

The Ohio State University

Department of Entomology

Columbus, OH

- 8:00 088 Introduction
Dave Shetlar, The Ohio State University,
Department of Entomology, Columbus,
OH

- 8:05 089 Activity of Subcortical Insects in Northeastern Ohio Nurseries
Kamal Ghandi, The Ohio State University, Department of Entomology, Wooster, OH, Michael E. Reding and Christopher M. Ranger, USDA-ARS, Horticultural Insects Research Lab, Wooster, OH, Danielle M. Lightle, Bryson J. Mosley, David G. Nielsen, and Dan Herms, The Ohio State University, Department of Entomology, Wooster, OH
- 8:25 090 Research on Exotic Scarabs in Ornamental Nurseries in Ohio
Michael E. Reding, USDA-ARS, Horticultural Insects Research Lab, Wooster, OH
- 8:45 091 Distribution, Horticultural Impacts and Biocontrol of the Japanese Beetle in Kansas
Bill Hilbert, Kansas Department of Agriculture, Plant Protection and Weed Control Program, Topeka, KS
- 9:05 092 Lure & Kill: A Novel Approach to Controlling Japanese Beetles
Elizabeth E. Morris and Parwinder S. Grewal, The Ohio State University, Wooster, OH
- 9:25 093 Developing Management Tools for the Emerald Ash Borer: Trapping and Detection, Insecticides, and Biological Control
Therese M. Poland, USDA Forest Service, East Lansing, MI, Deborah G. McCullough, Michigan State University, Department of Entomology and Department of Forestry, East Lansing, MI, and Leah S. Bauer, USDA Forest Service, East Lansing, MI

- 9:45 **BREAK**
- 10:00 094 European Crane Flies: Status and Impact of Two Invasive Species on Northeast Turf
Dan Olmstead and Dan Peck, Cornell University, Department of Entomology, Geneva, NY
- 10:20 095 The Rise and Fall of Mimosa Webworms
Dave Shetlar, The Ohio State University, Department of Entomology, Columbus, OH
- 10:40 096 Comparison of Bagworm (Lepidoptera: Psychidae) Management on Evergreen and Deciduous Plant Hosts
Anand B. Persad, Bal Rao, Greg Mazur, Brian Jeffers, John Siefer, and Holli Stebner, The Davey Institute, Kent, OH
- 11:00 097 Viburnum Leaf Beetle: The Ins and Outs of a Nasty New Landscape Pest
Paul Weston, Cornell University, Department of Entomology, Ithaca, NY
- 11:20 098 Sustainable Management of Soft Scale Outbreaks: Host Plant Resistance and Ant-Exclusion
Sarah Mack and Daniel A. Potter, University of Kentucky, Department of Entomology, Lexington, KY



Advances in Fruit & Vegetable IPM

Wednesday, March 26, 2008

8:00 AM – 11:30 AM

Madison

Organizers and Moderators:

Dave Epstein

Michigan State University
Department of Entomology
East Lansing, MI

and

Jim Jasinki

The Ohio State University
Integrated Pest Management Program
Urbana, OH

- 8:00 099 Influence of Methoxyfenozide on the Reproductive Behavior of Adult Tortricid Apple Pests
Bruce Barrett, University of Missouri, Department of Plant Sciences, Columbia, MO
- 8:25 100 Whole Farm Pheromone Mating Disruption for Control of Tortricid Moths in Tree Fruit
David Epstein, Michigan State University, Department of Entomology, East Lansing, MI
- 8:50 101 Specialty Crop Reregistration Woes: Are IPM-based Functional Ecology Measures an Answer to Environmental "Incident Reports"?
Mark Whalon, Michigan State University, Department of Entomology, East Lansing, MI
- 9:15 102 IPM in a Polyculture System Designed for the Urban Farmer
Joe Kovach, Ohio State University, IPM Program, Wooster, OH

- 9:40 **BREAK**
- 9:55 103 *Trichogramma ostrinae* for European Corn Borer Control in Bell Peppers
Ric Bessin and Katie Russell, University of Kentucky, Lexington, KY, and Karen Friley, Kentucky State University, Frankfurt, KY
- 10:20 104 New Tools for Corn Earworm Migration Forecasts, Mapping, and IPM in Sweet Corn: Expanding the Extension-Private Sector Network
Bill Hutchison, University of Minnesota, St. Paul, MN, Shelby Fleischer, Penn State University, , Eric Burkness, University of Minnesota, Mike Sandstrom and Dave Changnon, Northern Illinois University, Rick Weinzierl, University of Illinois, Rick Foster, Purdue University, Bryan Jensen, University of Wisconsin, Celeste Welty and Jim Jasinski, The Ohio State University, Beth Bishop, Michigan State University, Roger Leonard and Joshua Temple, Louisiana State University, Greg Payne, State University of West Georgia, Len Dobbins, FMC Corp., Brian Flood, Del Monte Corp., and Tom Rabaey, General Mills
- 10:45 105 The Evolving Dynamics of Virus/Vector Ecology in Relation to Seed Potato Production
Edward B. Radcliffe, University of Minnesota, Department of Entomology, St. Paul, MN, Jeffrey A. Davis, Louisiana State University, Department of Entomology, Baton Rouge, LA, and Matthew W. Carroll, U.S. EPA, Cincinnati, OH

- 11:10 106 Sources of Non-Persistent Viruses in Snap Bean Production in Wisconsin
R. L. Groves, University of Wisconsin, Department of Entomology, Madison, WI, S. H. Nouri, University of Wisconsin, Department of Plant Pathology, Madison, WI, and T. L. German, University of Wisconsin, Department of Entomology, Madison, WI



Submitted Papers

Wednesday, March 26, 2008

9:00 AM – 11:00 AM

Harding

Moderators:

Evan Lampert

University of Colorado

Department of Ecology and Evolutionary Biology

Boulder, CO

and

Ian McRae

University of Minnesota

Department of Entomology

St. Paul, MN

- 9:00 107 Something Suspended - Out of Place: The Armatopodidae of Eastern North America (Insecta: Coleoptera).
Daniel K. Young, University of Wisconsin, Madison, WI
- 9:12 108 A Fossil Braconid from the Green River Formation (Eocene)
Ray Fisher and Michael J. Sharkey, University of Kentucky, Lexington, KY

- 9:24 109 Plant Species Alters Quality of a Generalist Herbivore as a Host for a Polyembryonic Parasitoid
Evan Lampert and Deane Bowers, Department of Ecology and Evolutionary Biology, University of Colorado, Boulder, CO
- 9:36 110 Site Specific Management Resulting in Conservation of Natural Enemies
Ian V. MacRae, University of Minnesota, UMN-NWROC, Crookston, MN, Edward B. Radcliffe and David W. Ragsdale, University of Minnesota, St. Paul, MN
- 9:48 111 Baseline Susceptibility of Oriental Fruit Moth Larvae to Chlorantraniliprole (Rynaxypyr) and other Reduced-Risk Insecticides
Moneen M. Jones and Richard Weinzierl, University of Illinois, Department of Crop Sciences, Urbana, IL
- 10:00 112 *Bacillus thuringiensis*: Potential for Management of Emerald Ash Borer
Diana K. Londoño, Michigan State University, East Lansing, MI, and Leah S. Bauer, USDA Forest Service, North Central Research Station, East Lansing, MI
- 10:12 113 Structure of Bean Extrafloral Nectaries and their Insect Visitors
Mark E. Headings, The Ohio State University, Wooster, OH, and Leslie Morris, USDA-ARS, OARDC, Wooster, OH
- 10:24 114 Terrestrial Invertebrate Casualties in Monsoon Flash Floods in the Southwestern United States
Grant D. De Jong and Steven P. Canton, GEI Consultants, Inc., Littleton, CO

- 10:36 115 The Effects of Dietary Nitrogen on Symbiotic Nitrogen Fixation in the Eastern Subterranean Termite, *Reticulitermes flavipes*
Megan E. Meuti, Susan C. Jones, and Peter S. Curtis, The Ohio State University, Columbus, OH



**Student Affairs Symposium:
Walking the Entomological Line: Making the
Transition from Student to Professional**

Wednesday, March 26, 2008

1:30 PM - 5:00 PM

McKinley

Organizers and Moderators:

- Laura Campbell**, University of Nebraska Lincoln
David Coyle, University of Wisconsin
Ted Galvan, University of Minnesota
Alana Jacobson, Purdue University
Glené Mynhardt, The Ohio State University
Ann M. Ray, University of Illinois at Urbana-Champaign
Neil Spomer, University of Nebraska-Lincoln

- 1:30 116 Introduction.
Neil Spomer, University of Nebraska, Lincoln, NE
- 1:35 117 Opportunities in the Urban Pest Management Industry for Entomology Students
Kathy Heinsohn, National Pest Management Association, Fairfax, VA
- 1:55 118 From Bug School to the Office: Leveraging Entomological Talent in the Private Sector
Mike Culy, Dow Agrosciences LLC, Indianapolis, IN

- 2:15 119 Science Positions - The Nature Conservancy
John Shuey, Nature Conservancy, Indianapolis, IN
- 2:35 120 I Want to be an Entomologist When I Grow Up
Therese Poland, United States Forest Service NRS, East Lansing, MI
- 2:55 121 Crossing Over: How to Get and Keep a Job in the Federal Sector
Ernest Delfosse, USDA-ARS-National Program Staff, Beltsville, MD
- 3:15 **BREAK**
- 3:30 122 Preparing for an Academic Job: From Graduate Student to Assistant Professor
Matthew Ginzel, Purdue University, Department of Entomology, West Lafayette, IN
- 3:50 123 Teaching at a Liberal Arts College: Another Option for Your Entomology Degree
Chris Stanton, Baldwin-Wallace College, Berea, Ohio
- 4:10 124 Forging the Extension Link
Lee Townsend, University of Kentucky, Lexington, KY
- 4:30 125 If I Only Knew Then What I Know Now: An Applied Entomologist on the Tenure Track
Matthew O'Neal, Iowa State University, Department of Entomology, Ames, IA
- 4:50 Discussion



Exploring Plant-Mediated Outcomes in Arthropod Biological Control

Wednesday, March 26, 2008

1:30 PM - 5:35 PM

Garfield

Organizers and Moderators:

J.P. Michaud

Kansas State University
Agricultural Research Center - Hays
Hays, KS
and

Daniel Pavuk

Bowling Green State University
Department of Biological Sciences
Bowling Green, OH

This NCERA-125 Biological Control Symposium is dedicated to the memory of Dr. Robert J. O'Neil and all of his contributions to the area of biological control in the North Central Region. Bob was an enthusiastic researcher and provided many papers and great directions for research on biological control of field crop arthropod pests. His most recent projects provided additional inspiration to us in our battles against invasive pest species. Bob will be missed, but he will always be remembered as a valued colleague and staunch supporter of biological control research and its applications.

- | | | |
|------|-----|---|
| 1:30 | 126 | Introduction
J.P. Michaud , Kansas State University,
Agricultural Research Center-Hays, Hays,
KS |
| 1:35 | 127 | Use of Crop Data Layer Information for
Exploring Landscape-Mediated
Outcomes in Arthropod Biological
Control
Mike Brewer , Michigan State University,
IPM Program, East Lansing, MI |

- 2:00 128 Potential Application of Entomopathogens in Resistance Management for Bt Crops
Aaron J. Gassmann, Iowa State University, Department of Entomology, Ames, IA, Patricia Stock, University of Arizona, Department of Entomology, Tucson, AZ, Mark S. Sisterson, USDA, Parlier, CA, Yves Carrière, and Bruce E. Tabashnik, University of Arizona, Department of Entomology, Tucson, AZ
- 2:25 129 Rye Cover Crops in Soybeans Aid in Soybean Aphid Suppression
Z. Sezen, University of Minnesota, Department of Entomology, St. Paul, MN, R. L. Koch, Minnesota Department of Agriculture, St. Paul, MN, George E. Heimpel, P. Porter, B. Potter, David Ragsdale, and K. Koch, University of Minnesota, St. Paul, MN
- 2:50 130 Sunflower as a Resource for Beneficial Insects on the High Plains
J. P. Michaud, Kansas State University, Agricultural Research Center, Hays, KS
- 3:15 131 Plant-Mediated Interactions Among Arthropods in Weed Biological Control
Jim Nechols, Kansas State University, Department of Entomology, Manhattan, KS
- 3:40 **BREAK**
- 3:55 132 Interactions Among Natural Enemies, Aphids, and Resistant Plants
John J. Obrycki, University of Kentucky, Department of Entomology, Lexington, KY

- 4:20 133 Prairies as a Source for Soybean Aphid
(*Aphis glycines*) Predators
Wayne Ohnesorg, Iowa State University,
Department of Entomology, Ames, IA
- 4:45 134 Influences of Noncrop Vegetation
Adjacent to Row Crop Agroecosystems
on Natural Enemy Communities
Daniel M. Pavuk, Bowling Green State
University, Department of Biological
Sciences, Bowling Green, OH
- 5:10 135 Multitrophic Interactions Between
Bagworms and Their Natural Enemies on
Host Plants of Variable Quality
Marc Rhainds, Purdue University,
Department of Entomology, West
Lafayette, IN



Submitted Papers

Wednesday, March 26, 2008

2:30 - 4:00 pm

Harding

Moderators:

Joshua Heeren

and

Nicholas Tinsley

University of Illinois

Department of Crop Sciences

Urbana, IL

- 2:30 136 Comparison of Adult Corn Rootworm
Trapping Methodologies
Paul A. Neese, Randy M. Huckaba, Bruce
E. Maddy, Samuel M. Ferguson, Michael
D. Culy, Dow AgroSciences LLC,
Indianapolis, IN, and Christian Krupke,
Purdue University, Department of
Entomology, West Lafayette, IN

- 2:45 137 Genetic Mapping of Traits Impacting the Control of Lepidoptera Pests of Corn: Where are the Bt-Resistance Genes?
Douglas V. Sumerford, Brad Coates and Leslie C. Lewis, USDA-ARS, Ames, IA
- 2:57 138 Field Trial Performance of SmartStax™ Against Western Corn Rootworm and Above-Ground Insect Pests
Bruce E. Maddy, Paul A. Neese, Randy M. Huckaba, Melissa W. Siebert, David C. Ruen, Samuel M. Ferguson, and Michael D. Culy, Dow AgroSciences LLC, Indianapolis, IN
- 3:09 139 Lepidopteran Control with Bt11 x MIR162 Field Corn
Ryan Kurtz, Syngenta Biotechnology, Inc., Research Triangle Park, NC, Von Kaster, Syngenta Seeds, Slater, IA, Wayne Fithian, Jeff Krumm, and **Rick Smelser**, Syngenta Seeds, Waterloo, NE
- 3:21 140 Optimum® AcreMax™ Systems: Taking “Management” Out of Refuge Management
Paula M. Davis and William A. Belzer, Pioneer, Johnston, IA
- 3:33 141 Optimum® AcreMax™ 1 Insect Protection: Unique Trait Characteristics Compatible with Seed-Blended Refuge
Steve Lefko, Pioneer, Wilmington, DE, Rachel Binning, Tim Nowatzki, and Steve Thompson, Pioneer, Johnston, IA
- 3:45 142 Optimum® AcreMax™ 1 Insect Protection: Field Measures of Adult Corn Rootworm Production from Seed Blends
Timothy Nowatzki, Steve Thompson, and Mel Peters, Pioneer, Johnston, IA



Submitted Posters

D143 – D162

7:00 AM – 5:00 PM

authors present 3:00 PM – 4:00 PM

Harrison

Systematics, Evolution, and Biodiversity

D143 Genetic Analyses of the *Melanoplus packardii* Group (Orthoptera: Acrididae) in the Great Plains
Erica J. Lindroth and Mathew L. Brust, University of Nebraska, Lincoln, NE, W. Wyatt Hoback, University of Nebraska, Kearney, NE, Robert J. Wright, Thomas E. Hunt, and John E. Foster, University of Nebraska

D144 Burying Beetles Prefer Moist Soil During Periods of Inactivity
W. Wyatt Hoback and Rachel M. Anschutz, University of Nebraska, Department of Biology, Kearney, NE

D145 Effects of Pitfall Trap Preservative on Collections of Forest Ground Beetles (Coleoptera: Carabidae)
Kenneth W. McCravy, Western Illinois University, Department of Biological Sciences, Macomb, IL, and Jason E. Willand, U. S. Geological Survey, Henderson, NV

D146 Rediscovery of the Nine-spotted Lady Beetle, *Coccinella novemnotata* Herbst in Western Nebraska
Mathew L. Brust and William W. Hoback, University of Nebraska, Kearney, NE

Plant-Insect Ecosystems

D147 Grower Perception and Practice of Integrated Pest Management (IPM)
Ayanava Majumdar, North Dakota State University, Finley, ND, Al Ulmer, Jeremiah Lien, Lesley Lubenow, Lionel Olson, Mike Rose,, and Nels Peterson, North Dakota State University

- D148 Abundance of Minute Pirate Bug (Heteroptera: Anthracoridae) in Insecticide-Treated Soybeans
Bradley L. McManus, Billy W. Fuller, and Kelley J. Tilmon, South Dakota State University, Brookings, SD
- D149 The Soybean Aphid Economic Threshold is Revised in South Dakota
Kelley J. Tilmon and Billy W. Fuller, South Dakota State University, Brookings, SD, and Martin W. Draper, USDA-CSREES, Washington, DC
- D150 Field Testing of Experimental Soybean Lines and Insecticidal Seed Treatments to Control Soybean Aphid
Ronald E. Estes, Nicholas A. Tinsley, Kevin L. Steffey, Joshua R. Heeren, and Michael E. Gray, University of Illinois, Department of Crop Sciences, Urbana, IL
- D151 Differential Responses of Chinch Bugs to Neonicotinyl Insecticides
Mitchell D. Stamm, Frederick P. Baxendale, and Tiffany M. Heng-Moss, University of Nebraska, Lincoln, NE
- D152 DuPont Rynaxypyr™ Insecticide; Biological Attributes of a Novel Anthranilic Diamide Insecticide
Paula G. Marcon, DuPont Crop Protection, Newark, DE, Dan W. Sherrod, DuPont Crop Protection, Memphis, TN, Marsha Martin, DuPont Crop Protection, Columbus, OH, and **Mick Holm**, DuPont Crop Protection, Waunakee, WI
- D153 Agronomic Performance of Multiple-Stacked Insect Protection Traits in Corn
Ed King, Dow AgroSciences, Indianapolis, IN, Paul Neese, Dow AgroSciences, Brownsburg, IN, Mike Culy, Dow AgroSciences, Indianapolis, IN, and Jim Bing, Dow AgroSciences, Huxley, IA

- D154 Corn Earworm and Southwestern Corn Borer Efficacy of New Stacked Event Corn Hybrids in 2007
Larry Buschman, Kansas State University, Department of Entomology, Garden City, KS, Holly Davis, Kansas State University, Department of Entomology, Manhattan, KS, and Phil Sloderbeck, Kansas State University, Department of Entomology, Garden City, KS
- D155 Optimum® AcreMax™ 1 Insect Protection: Field Performance of Seed Blends for Rootworm Resistance Management
Murdick J. McLeod, Pioneer, Windfall, IN, Steve Paszkiewicz, Pioneer, Johnston, IA, Paul Gaspar, Pioneer, Mankato, MN, Tom Doerge, Pioneer, Johnston, IA, Jim Trybom, Pioneer, Ivesdale, IL, Chad Brewer, Pioneer, Proctor, AR, and Jeremy Groeteke, Pioneer, York, NE
- D156 Validation of a Novel Resistance Monitoring Technique for Corn Rootworm (Coleoptera: Chrysomelidae) and Event DAS-59122-7 Maize
Rachel Binning and Tim Nowatzki, Pioneer, Johnston, IA, Steve Lefko, Pioneer, Wilmington, DE, Steve Thompson, Pioneer, Johnston, IA, and Terence Spencer, and Blair Siegfried, University of Nebraska, Lincoln, NE
- D157 Western Corn Rootworm Beetle Populations in Transgenic Corn
A. Michael Roberts, Amanda Rettele, and Jeff Whitworth, Kansas State University, Department of Entomology, Manhattan, KS
- D158 Toxicity of Botanical Formulations to Nursery-Infesting White Grubs (Coleoptera: Scarabaeidae)
Christopher M. Ranger and Michael E. Reding, USDA-ARS, Horticultural Insects Research Lab, Wooster, OH, Jason B. Oliver, Tennessee State University, James J. Moyseenko, USDA-ARS, Wooster, OH, and Nadeer N. Youssef, Tennessee State University

- D159 Making Entomological Greeting Cards
Joseph L. Spencer, Illinois Natural History Survey, Center for Ecological Entomology, Champaign, IL
- D160 Behavioral Responses of *Tribolium castaneum* (Coleoptera: Tenebrionidae) to Patch Boundaries: Role of Perceptual Range
Susan A. Romero, Kansas State University, Department of Entomology, Manhattan, KS, James F. Campbell, USDA/ARS Grain Marketing and Production Research Center, Manhattan, KS, James R. Nechols, Kansas State University, Department of Entomology, Manhattan, KS, and Kimberly A. With, Kansas State University, Division of Biology, Manhattan, KS

Structural, Veterinary, and Public Health Systems

- D161 Size Matters: Factors Affecting Pinworm Parasitism in the Australian Cockroach
Krista L. Winters, Shawn A. Meagher, and Kenneth W. McCravy, Western Illinois University, Department of Biological Sciences, Macomb, IL
- D162 Infection and Co-infection Rates of Four Microbes in *Ixodes scapularis* from IN, ME, PA, and WI
Fresia E. Steiner and Robert R. Pinger, Ball State University, Physiology and Health Science, Muncie, IN, Carolyn N. Vann, Ball State University, Department of Biology, Muncie, IN, Nate Grindle, David Civitello, Keith Clay, and Clay Fuqua, Indiana University, Department of Biology, Bloomington, IN



SCHEDULE

Thursday, March 27, 2008

Business Meeting

8:00 AM – 9:00 AM

Garfield

Registration

8:00 AM – 10:30 AM

Hayes Foyer

Changing Face of Field Crop Insect Management

9:00 AM – 12:15 AM

Garfield

Citizen Science in the Study of Insect Biodiversity

9:00 AM – 12:15 PM

Harding

Executive Committee Meeting

1:00 PM – 4:00 PM

Garfield



PROGRAM

Thursday, March 27, 2008

Changing Face of Field Crop Insect Management

Thursday, March 27, 2008

9:00 AM – 12:15 PM

Garfield

Moderators:

Matt O'Neal

Iowa State University
Department of Entomology

Ames, IA

and

Matthew Carroll

U.S. Environmental Protection Agency

Cincinnati, OH

- | | | |
|------|-----|--|
| 9:00 | 163 | Welcome |
| 9:05 | 164 | Learning to Manage the Soybean Aphid:
Assessing Biological Control and
Establishing Economic Thresholds
David W. Ragsdale , University of
Minnesota, Department of Entomology,
St. Paul, MN |
| 9:30 | 164 | The Rise and Fall of Lepidopteran Pests
of Corn: Perspectives on the European
Corn Borer and Western Bean Cutworm
in a Bt World
Marlin E. Rice , Iowa State University,
Department of Entomology, Ames, IA |
| 9:55 | 166 | Western Corn Rootworm Resistance
Management: From Insecticides to
Rootworm-Protected Traits
Lance J. Meinke , University of Nebraska,
Department of Entomology, Lincoln, NE |

- 10:20 167 This is Not Your Father's Corn Rootworm Beetle
Joseph L. Spencer, Illinois Natural History Survey, Center for Ecological Entomology, Champaign, IL
- 10:45 **BREAK**
- 11:00 168 Nonindigenous Plants and Insects: Inter-related Challenges in Managed Systems
Robert G. Ahern and Douglas A. Landis, Michigan State University, Department of Entomology, East Lansing, MI, Doug W. Schemske, Michigan State University, Department of Plant Biology, East Lansing, MI
- 11:25 169 Use of Spectral Vegetation Indices for Detection of European Corn Borer Infestation in Iowa Corn Plots
Matthew W. Carroll, Oak Ridge Institute for Science and Education, U.S. Environmental Protection Agency, Cincinnati, OH, John A. Glaser, U.S. EPA, Cincinnati, OH, Richard L. Hellmich, USDA-ARS, Ames, IA, Thomas E. Hunt, University of Nebraska, Concord, NE, Dennis Calvin, The Pennsylvania State University, University Park, PA, Thomas W. Sappington, USDA-ARS, Ames, IA, Ken Copenhaver and John Fridgen, Institute for Technology Development, Savoy, IL
- 11:50 170 Resistance Management Research for PIP Crops
John A. Glaser, US Environmental Protection Agency, Cincinnati, OH



Citizen Science in the Study of Insect Biodiversity

Thursday, March 27, 2008

9:00 AM – 12:15 PM

Harding

Organizers and Moderators:

David Horn

The Ohio State University
Department of Entomology
Columbus, OH

and

Barb Bloetscher

The Ohio State University
C. Wayne Ellet Plant and Pest Diagnostic Clinic
Columbus, OH

- | | | |
|------|-----|--|
| 9:00 | 173 | Welcome
Barb Bloetscher , The Ohio State University, C. Wayne Ellet Plant and Pest Diagnostic Clinic, Columbus, OH |
| 9:05 | 172 | Encouraging Effective Citizen Science: an Example of a Success Story from the Ohio Longterm Butterfly Monitoring Program
Joe Keiper , Cleveland Museum of Natural History, Department of Invertebrate Zoology, Cleveland, OH |
| 9:30 | 173 | The Impact of Citizen Science on Ornithology in Ohio
Aaron Boone , The Ohio State University, School of Environment and Natural Resources, Columbus, OH |
| 9:55 | 174 | Is There a Middle Ground on Spiders? The Ohio Spider Survey 14 Years On
Richard Bradley , The Ohio State University, Department of Evolution, Ecology, and Organismal Biology, Marion, OH |

- 10:20 **BREAK**
- 10:35 175 Beespotter: a Web-based Partnership
Between Professional and Citizen-
Scientists to Census and Appreciate
Pollinators
Liz Graham, University of Illinois,
Department of Entomology, Urbana, IL
- 11:00 176 Dragonflies and Citizen Science
Robert Glotzhofer, The Ohio Historical
Society, Columbus, OH
- 11:25 177 Using the Insectary as a Means of Public
Outreach and Engagement at The Ohio
State University
George Keeney, The Ohio State
University, Department of Entomology,
Columbus, OH
- 11:50 Summary
Dave Horn, The Ohio State University,
Department of Entomology, Columbus,
OH



Author Index

A

Ahern, Robert G.	168
Ahmad, Aqeel	D075
Anschutz, Rachel M.	D144
Archbold, Doug D.	002
Arthur, Frank A.	008
Avendano, M. Felicitas	004

B

Barrett, Bruce A.	099, D067
Bauer, Leah S.	093, 112
Bauer, Erin	043
Baxendale, Frederick P.	046, D151
Beauzay, Patrick	052
Belzer, William A.	140
Benoit, Joshua B.	027, 026, 012
Bessin, Ric	103
Bing, Jim	D153
Binning, Rachel	D156, 141
Bishop, Beth	104
Bonello, Pierluigi	018
Boone, Aaron	173
Bradley, Richard	174
Brewer, Mike	127
Brewer, Chad	D155
Brown, Rebecca B.	D071
Brown, Grayson C.	009
Brust, Mathew L.	014, D146, D143
Burkness, Eric	104
Buschman, Larry	D154, 024

C

Calvin, Dennis	169
Campbell, James F.	D160, 008
Cañas, Luis A.	019
Cancelado, Rafael E.	038
Canton, Steven P.	114
Carrière, Yves	128
Carroll, Matthew W.	105, 169
Castillo, Diana	D063
Chandrasena, Desmi I.	D065
Changnon, Dave	104
Chen, Ming-Shun	D075, 024
Chorbadjian, Rodrigo A.	017
Cira, Theresa	D072
Civitello, David	D162
Claborn, David C.	009

Clay, Keith	D162
Coates, Brad	082, 137
Coffelt, Mark A.	025
Colvin, Sarah M.	D068
Copenhaver, Ken	169
Courtney, Gregory W.	D071
Cramer, Gary	D075
Crespo, Andre B.	D073
Culy, Michael D.	136, 054, 118, 138, D153
Currie, Robert	029
Curtis, Peter S.	115

D

Dahm, Heather	043
Davis, Holly	D154
Davis, Jeffrey A.	105
Davis, Paula M.	140
Davis, Robert W.	047
De Jong, Grant D.	114
Delfosse, Ernest	121
Denlinger, David L.	026, 027, 012, 028
Desai, Suresh	029
DiFonzo, Christina D.	D065
Dobbins, Len	104
Doerge, Tom	D155
Draper, Martin W.	D149

E

Echegaray, Erik	D075
Eirich, Melanie	043
Ellis, Marion	011
Elnitsky, Michael A.	026, 027, 012
Epstein, David	100
Eskelson, Michael J.	002
Estes, Ronald E.	D064, 004, D150

F

Farfan, Monica A.	D057
Ferguson, Samuel M.	138, 136
Fields, Paul G.	007
Fisher, Ray	108
Fithian, Wayne	139
Fleischer, Shelby	104
Flood, Brian	104
Florin, David A.	009
Foster, Rick	104, 053, D062
Foster, John E.	D143
Foster, Woodbridge A.	D069, D080
Freeman, Patricia W.	D060

Fridgen, John	169
Friley, Karen	103
Fuller, Billy W.	D149, D147
Fuqua, Clay	D162
G	
Gallagher, Nicola T.	021
Galvan, Tederson L.	D073
Gaspar, Paul	D155
Gassmann, Aaron J.	128
Geluso, Keith	D060
German, T. L.	106
Gfeller, Jason M.	001
Ghandi, Kamal	089
Ginzler, Matthew D.	006, 122
Glaser, John A.	170, 169
Glotzhober, Robert	176
Graham, Liz	175
Gray, Michael E.	004, D064, D150
Grewal, Parwinder S.	013, 092
Grindle, Nate	D162
Groeteke, Jeremy	D155
Groves, R. L.	106
Gut, Larry	035
H	
Hammond, Ronald B.	D077
Hanks, Lawrence M.	005
Harwood, James D.	016, 002
Hawkin, Karen J.	007
Haynes, Kenneth F.	040
Headings, Mark E.	113
Heeren, Joshua R.	004, D150, D064
Heimpel, George E.	129
Hein, Gary L.	D076
Heinsohn, Kathy	117
Hellmich, Richard L.	169
Heng-Moss, Tiffany M.	D151
Herms, Daniel A.	033, 018, 089, 017
Hilbert, Bill	091
Hoback, W. Wyatt	D055, D146, 001, D144, D143, 014, D060, D061
Hogg, David B.	003
Holliday, Neil J.	D078
Holm, Mick	D152
Horn, David J.	D057
Hou, Xingwei	020
Huckaba, Randy M.	138, 136

Hunt, Thomas E.	D143, 169
Husen, Timothy J.	D079, 048
Hutchison, William D.	104, 038
I	
Igg, Ckyde	043
J	
Jacobson, Alana L.	D062
Jasinki, Jim	104
Jayas, Digvir	029
Jeffers, Brian	096
Jensen, Bryan	104
Johansen, Kacie J.	022
Johnson, Kevin D.	015
Johnson, Norman F.	010
Jones, Moneen M.	111
Jones, Susan C.	041, 115, 021
K	
Kalisch, James A.	046
Kamble, Shripat T.	D079, 048, 025
Kapetanovic, Nino	043
Kaster, Von	139
Keeney, George	177
Keeseey, Ian W.	D067
Keeten, Lacey M.	D055
Keiper, Joe	172
Khajuria, Chitvan	024, 083
King, Ed	D153
Klompen, Hans	031
Knodel, Janet	049
Knolhoff, Lisa M.	084
Koch, R. L.	129
Koch, K.	129
Kovach, Joe	102
Kovacic, Brian W.	009
Kritsky, Gene	034
Krumm, Jeff	139
Krupke, Christian	136
Kurtz, Ryan	139
L	
Lampert, Evan	109
Landis, Douglas A.	168
Lawyar, Phillip G.	009
Lazzari, Fernanda N.	020
Lee, Jr., Richard E.	027, 012, 026
Lefko, Steve	141, D156
Leonard, Roger	104

Lewis, Leslie C.	137
Li, Aiqing	028
Lien, Jeremiah	D147
Lindroth, Erica J.	D143
Liu, Zhiwei	D056
Londoño, Diana K.	112
Lopez-Martinez, Giancarlo	012, 027, 026
Lubenow, Lesley	D147

M

Mack, Sarah	098
MacRae, Ian V.	110
Maddy, Bruce E.	136, 138
Majumdar, Ayanava	051, D147
Mallinger, Rachel E.	003
Marcon, Paula G.	D152
Martin, Marsha	D152
Mason, Linda	045
Maupin, M. Anthony	D059
Mazur, Greg	096
McCravy, Kenneth W.	D145, D161
McCullough, Deborah G.	093
McLeod, Murdick J.	D155
McManus, Bradley L.	D147
Meagher, Shawn A.	D161
Medina-Ortega, Karla J.	019
Meinke, Lance J.	166, D066
Meuti, Megan E.	115
Michaud, J. P.	130
Michel, Andrew	036
Miller, Nicholas	087
Minter, Logan M.	009
Mitchell, Robert F.	005
Morris, Elizabeth E.	013, 092
Morris, Leslie	113
Morton, Phillip K.	086
Moyseenko, James	D158
Muilenburg, Vanessa L.	018

N

Nechols, James R.	131, D160
Neese, Paul A.	138, 136, D153
Niblack, Terry L.	004
Nouri, S. H.	106
Nowatzki, Timothy	142, 141, D156

O

O'Neal, Matthew E.	004, 120, 125, 015, 037
O'Neil, Robert J.	D063

Obopile, Motshwari	D077
Obrycki, John J.	016, 002, 132
Oghiakhe, Sunday	D078
Ohnesorg, Wayne	133
Oliver, Jason B.	D158
Olmstead, Dan	094
Olson, Lionel	D147
Onstad, David W.	084

P

Pachamuthu, Pari	044
Paszkwicz, Steve	D155
Pavuk, Daniel M.	134, D074
Payne, Greg	104
Peck, Dan	094
Persad, Anand B.	096
Peters, Mel	142
Peterson, Julie A.	016
Peterson, Nels	D147
Pinger, Robert R.	D162
Poland, Therese M.	093
Porter, P.	129
Potter, B.	129
Potter, Daniel A.	098
Potter, Michael F.	040
Price, Michele B.	D072

R

Rabaey, Tom	104
Rackowski, Joseph M.	023
Radcliffe, Edward B.	110, 105, 038
Ragsdale, David W.	164, 110, 129
Ranger, Christopher M.	089, D158
Rao, Bal	096
Ratcliffe, Susan T.	084
Rector, Meghan A.	D070
Reding, Michael E.	D158, 090, 089
Renaud, Anaïs	D058
Rettele, Amanda	D157
Rhains, Marc	135
Rice, Marlin E.	164
Riens, John R.	D061
Roberts, J. Andrew	D070
Roberts, A. Michael	D157
Robertson, Hugh M.	084
Rodriguez, Adrea C.	D069
Romero, Alvaro	040
Romero, Susan A.	D160
Rose, Mike	D147

Roughley, Rob	D058
Ruen, David C.	138
Rundquist, Don C.	D076
Russell, Katie	103
S	
Sandstrom, Mike	104
Sapp, Tyler D.	D056
Sappington, Thomas W.	169
Savage, Jade	D058
Schemerhorn, Brandi J.	085
Schemske, Doug W.	168
Scherer, Clay W.	025
Schiff, Nathan M.	006
Schroeder, Jared B.	004
Sezen, Z.	129
Sharanowski, Barb	022
Sharkey, Michael J.	108, 022
Sherrod, Dan W.	D152
Shetlar, Dave	095
Shuey, John	119
Siebert, Melissa W.	138
Siefer, John	096
Siegfried, Blair D.	D156, D073
Singh, Vishal	043
Sisterson, Mark S.	128
Sloderbeck, Phil	D154, D075
Smelser, Rick	139
Spencer, Joseph L.	D159, 167
Spencer, Terence A.	D156, D073
Spikes, Annie E.	006
Spomer, Neil A.	048, 025
Stamm, Mitchell D.	D151
Stanbridge, Dean	007
Stanton, Chris	123
Stebner, Holli	096
Steffey, Kevin L.	004, 050, D064, D150
Steiner, Fresia E.	D162
Stilwell, Abby R.	D076
Stock, Patricia	128
Stone, Julie M.	D079
Stone, Chris M.	D080
Subramanyam, Bhadriraju	020
Sumerford, Douglas V.	137
Sutton, April E.	008
T	
Tabashnik, Bruce E.	128
Talamas, Elijah J.	010

Taylor, Robin M.	D080
Teets, Nicholas M.	012
Tembo, Rostern N.	D074
Temple, Joshua	104
Thomison, Peter R.	D077
Thompson, Steve	142, D156, 141
Tilmon, Kelley J.	D147, D149
Tinsley, Nicholas A.	D064, 004, D150
Townsend, Lee	124
Trybom, Jim	D155
Tylka, Gregory	004

U

Ulmer, Al	D147
-----------	------

V

Vann, Carolyn N.	D162
------------------	------

W

Wagnitz, Jeremy J.	011
Walden, Kimberly K. O.	084
Wang, Changlu	042
Weinzierl, Richard	111, 104
Weller, Susan	032
Welty, Celeste	104
Weston, Paul	097
Whalon, Mark	101
Whitworth, Jeff	D075, D157
Willand, Jason E.	D145
Winters, Krista L.	D161
With, Kimberly A.	D160
Wood, Diane L.	D059
Wright, Robert J.	014, D143

Y

Yerdon, Roger W.	D060
Yoder, Jay A.	026
Young, Daniel K.	107, D072
Young, Stephen T.	D066
Youssef, Nadeer N.	D158

Z

Zhu, Kun Yan	008, 024
Zhu, Yu-Cheng	024

Taxonomic Index

A

<i>Acalymma vittatum</i>	005
<i>Aceria tosichella</i>	D076
Acrididae	D143
<i>Acyrtosiphon pisum</i>	003
<i>Ageneotettix deorum</i>	014
<i>Agrilus anxius</i>	018
<i>Agrilus planipennis</i>	112
<i>Agrotis ipsilon</i>	139, 138
<i>Anaplasma phagocytophylum</i>	D162
<i>Anisodactylus sanctaecrucis</i>	002
<i>Anopheles gambiae</i>	D069, D080
<i>Antistrophus silphii</i>	D056
<i>Aphis glycines</i>	D063, D064, D147, D149, 105, 004, D065, 003, 015, D150, 133, 164
<i>Aphorista vittata</i>	D072
<i>Apis mellifera</i>	011, 029
Araneae	134
Artematopodidae	107
<i>Arundinaria gigantea</i>	D059

B

<i>Babesia</i>	D162
<i>Bacillus thuringiensis</i>	016, D073, 112, 128
<i>Belgica antarctica</i>	012, 027
<i>Bemisia tabaci</i> biotype B	019
<i>Betula papyrifera</i>	018
Blephariceridae	D071
<i>Blissus leucopterus hirtus</i>	D151
<i>Blissus occiduus</i>	D151
<i>Borrelia burgdorferi</i>	D162
Braconidae	108

C

Carabidae	D145, 016
<i>Carpophilus lugubris</i>	D154
<i>Cimex lectularius</i>	040
<i>Coccinella novemnotata</i>	D146
<i>Coccinella septempunctata</i>	134, 003
<i>Copidosoma floridanum</i>	109
Crambidae	D074
<i>Curculio sayi</i>	D067
<i>Cyclocephala borealis</i>	D158
<i>Cyclotrachelus sodalis</i>	016

D

<i>Danae testacea</i>	D072
Deuterophlebiidae	D071
<i>Diabrotica barberi</i>	D153, D155, 140, 142, 141
<i>Diabrotica virgifera</i>	138, 136
<i>Diabrotica virgifera virgifera</i>	D077, 084, D153, D066, D155, 140, 142, 141, D156
<i>Diatraea grandiosella</i>	D154, 139
Diplopoda	D057
E	
<i>Edwardsina gigantea</i>	D071
<i>Edwardsina gracillis</i>	D071
<i>Elporia</i> sp.	D071
Endomychidae	D072
<i>Endomychus biguttatus</i>	D072
<i>Eptesicus fuscus</i>	D060
<i>Erwinia tracheiphila</i>	005
<i>Euphorbia pulcherrima</i>	019
<i>Eurypogon harrisii</i>	107
<i>Eurypogon niger</i>	107
<i>Exomala orientalis</i>	D158
F	
Fanniidae	D058
<i>Fraxinus</i> spp	112
G	
<i>Glycine max</i>	D147
<i>Grapholitha molesta</i>	111
H	
<i>Harmonia axyridis</i>	D064, 134, 003, 113
<i>Harpalus pensylvanicus</i>	016, 002
<i>Helicoverpa zea</i>	D154, 139, 138, D062
<i>Heterodera glycines</i>	004
<i>Heterorhabditis bacteriophora</i>	013
<i>Heterorhabditis bacteriophora</i>	128
<i>Hippodamia convergens</i>	001
<i>Horaia montana</i>	D071
<i>Horaia namtoki</i>	D071
I	
Ichneutinae	108
<i>Ironoquia plattensis</i>	D061
<i>Ixodes scapularis</i>	D162
J	
<i>Julida</i>	D057
L	
<i>Leidynema appendiculata</i>	D161
<i>Lutzomyia shannoni</i>	009

<i>Lutzomyia vexator</i>	009
<i>Lycoperdina ferruginea</i>	D072
M	
<i>Macropogon piceus</i>	107
<i>Mallodon dasystemus</i> (Say)	006
<i>Mantis religiosa</i>	D159
<i>Mayetiola destructor</i>	D075 , 085, 086
<i>Melanoplus angustipennis</i>	014
<i>Melanoplus foedus</i>	D143
<i>Melanoplus foedus fluviatilis</i>	D143
<i>Melanoplus packardii</i>	D143
<i>Melittobia digitata</i>	D055
<i>Meta ovalis</i>	D070
Muscidae	D058
<i>Mycetaea subterranea</i>	D072
<i>Mycetina perpulchra</i>	D072
<i>Myzus persicae</i>	105, 110
N	
<i>Nabis</i> spp.	134
<i>Necroides surinamensis</i>	D060
<i>Neodiprion sertifer</i>	017
<i>Nicrophorus americanus</i>	D060
<i>Nicrophorus americanus</i>	D144
<i>Nicrophorus carolinus</i>	D060, D144
<i>Nicrophorus marginatus</i>	D060, D144
<i>Nicrophorus orbicollis</i>	D060, D144
<i>Nicrophorus tomentosus</i>	D060
O	
<i>Oreiscelio</i>	010
<i>Orius insidiosus</i>	D064, 134, 003
<i>Orius tristicolor</i>	D147
<i>Ostrinia nubilalis</i>	D074, D147, 169, 139, D073, 024, 082, 083, 137
P	
<i>Paltostoma</i> sp.	D071
<i>Paulianina (Eupaulianina)</i> sp.	D071
<i>Paulianina (Paulianina) umbra</i>	D071
<i>Pectinophora gossypiella</i>	128
<i>Periplaneta australasiae</i>	D161
<i>Peritheates</i> sp.	D071
<i>Phymaphora pulchella</i>	D072
<i>Pinus rigida</i>	D068
<i>Pinus sylvestris</i>	017
Platygastroidea	010
<i>Popillia japonica</i>	D158, 013
<i>Prenolepis imparis</i>	113

Psychidae	096
<i>Pyemotes</i>	046
R	
<i>Reticulitermes flavipes</i>	D079, 021, 115
<i>Rhanidea unicolor</i>	D072
Rhinotermitidae	115
<i>Rhizotrogus majalis</i>	D158
<i>Richia albicosta</i>	139, 138
S	
<i>Sarcophaga crassipalpis</i>	028
Scelionidae	010
Silphidae	D144
<i>Silphium integrifolium</i>	D056
<i>Silphium perfoliatum</i>	D056
<i>Smicronyx fulvus</i>	D147
<i>Spirostreptida</i>	D057
<i>Spodoptera frugiperda</i>	139, 138
<i>Steinernema riobrave</i>	128
<i>Stenolophus comma</i>	016
<i>Symbiotes duryi</i>	D072
<i>Symbiotes gibberosus</i>	D072
T	
<i>Thyridopteryx ephemeraeformis</i>	135
Tortricidae	099, 100
<i>Tribolium castaneum</i>	007, D160, 008, 020
<i>Tribolium confusum</i>	007, 008
<i>Trichogramma ostrinae</i>	103
<i>Trichoplusia ni</i>	109
Trichoptera	D061
V	
<i>Varroa destructor</i>	011, 029
<i>Vicia fava</i>	113
Z	
<i>Zea mays</i>	D077, D066

Keyword Index

A

adaptation	036
adult corn rootworm	136
aerosol insecticides	008
AFLP	D143
agroindustry	054
American burying beetle	D060, D144
amino acids	017
<i>Anaplasma</i>	D162
ant management	048
ant exclusion	098
Antarctica	026, 027
ants	023
aphids	132
aquatic-terrestrial interface	114
ash trees	112, 033
ATP-synthase	028
Australian cockroach	D161

B

bacterial wilt of cucurbits	005
bagworm	096
bed bugs	040
bee-spotters	175
behavior	001, D159, 007
beneficial insects	130, D147
big brown bat	D060
bioassays	111
biodiversity	D059, 010, D058
bioinformatics	032
biological control	110, 002, 112, D063, 013, 003, 127, 093, 164, 091
biopesticides	D158
bird count	173
black cutworm	139
blacklegged tick	D162
broad spectrum activity	D152
bronze birch borer	018
Bt	016, D074, D154, 164
Bt resistance	137

C

calcium signaling	012
catalase	027
chemical ecology	019
chestnut	D067

chlorantraniliprole	D152
confused flour beetle	007
conservation	D059
conservation biological control	134
contact pheromones	006
corn	D077, 169
corn earworm	139, D062, 104
corn rootworm	D077, D153, D155, 140, 142, 141, D156
cover crop	129
Cry1Ab	D154, D073
Cry1F	D154
D	
deciduous plants	096
dehydration	027
detection	093
dietary nitrogen	115
diversity	D068
dragonflies	176
E	
eastern subterranean termite	021, 115
electronic resources	052
ELISA	016
emerald ash borer	112, 093, 033
endangered species	D060
entomopathogenic nematodes	128
environmental incident reports	101
essential oils	D158
European corn borer	D074, 169, 139, D073, 024, 103, 082, 083, 164
European crane flies	094
European pine sawfly	017
evergreen	096
evergreen bagworm	135
exotic scarabs	090
expression profile	024
extrafloral nectaries	113
F	
fall armyworm	139
farming systems	003
fitness cost	128, D073
flash flooding	114
flesh fly	028
flour beetles	007
fly free dates	D075
fossil	108

frass	005
freeze tolerance	012
G	
gall wasp	084
generalist herbivore	109
genetic variation	086, 087
genomics	036
genotyping	D079
Green River Formation	108
greeting card	D159
ground beetles	D145
grower preference	051
grower survey	D147
GST	024
H	
habitat disturbance	D057
habitat use	D144
hairy chinch bug	D151
handsome fungus beetle	D072
hardwood stump borer	006
heat shock proteins	028
heat treatment	020
Hessian fly	D075, 085, 086
honey bee	011, 029
host plant resistance	D064, 098
Hsps	027
hyperspectral	169
I	
immigration	D160
Indoxacarb	025
insect visitors	113
insectary	177
invasive mites	031
IRM	D073, 140, 142, 141, 170
J	
Japanese beetle	013, 091
L	
lady beetle	D146, 001
landscape-mediated outcomes	127
Leishmaniasis	009
linkage maps	137
Lyme disease	D162
M	
malaria	D069
mate recognition	006

mating behavior	006, D080
mating disruption	035
mechanism of resistance	019
medical entomology	D069
mesocosm	D080
methyl bromide alternative	020
methoprene	008
methoxyfenozide	099
microarray	084
microbial degradation	025
Microgastroid	108
migration	104
millipedes	D057
mimosa webworm	095
minute pirate bug	D147
mites	026
monitoring	136
mosses	107
mouthparts	D071
movement behavior	D160
multitrophic interactions	135
N	
natural enemies	D064, 003, 132
new state records	D072
nitrogen fixation	115
non-indegenous plants	168
non-persitent virus	106
non-target effects	016
noncrop habitats	134
nurseries	090
O	
online course content	038
orb web	D070
organic agriculture	003
over-wintering	D068, D063
overhydration	027
oxalic acid	011
P	
parasitism/ parasitoid	D161, 109, D055, 134
PCR	005
pea aphid	003
perceptual range	D160
periodical cicadas	034
pest resistance management	170
plant defenses	017
plant stress	169

plant-mediated interaction	131
polar insects	012
polyculture	102
population activity	002
Potato leafroll virus	105
Potato virus Y	105
praying mantid	D159
predation	D060, D070
predators	133, 134
preservative	D145
proteomics	028
public health	009
pyrethrin	008
pyrethroids	D062
Q	
QTL mapping	137
R	
rapid cold-hardening	012, 028
red flour beetle	007, D160, 020
reduced risk insecticides	D158
remote sensing	169, D076, 170
residential IPM	042
residue degradation	008
resistance	018, 040, 128, 132, 166, D066, D156
risk - assessment	016
rosinweed	D056
rynaxypyr	D152
S	
sand flies	009
scots pine	017
seasonal ecology	D066
seed potato	105, 110
seed treatment	D077
silverleaf whitefly	019
SmartStax	D153
snap bean	106
social parasitism	023
soft scale	098
southwestern corn borer	139
soybean	D147
soybean aphid	D064, D149, 105, 004, D065, 003, D150, 129, 015, 133, 164, D063
soybean cyst nematode	004
specialist	D061

specialty crop	101
species diversity	D057
spinosad	D074
stored product pest management	045
striped cucumber beetle	005
subterranean termite	047, D079, 041
sugar feeding	D080
sunflower	130
sustainable agriculture	053
systematics	010, 107, 031, 032
T	
targeted application	110
taxonomy	010, 031
teaching	D055
technology transfer	050, 049
Termidor	047
termiticide mineralization	025
terpenes	017
thermal response	029
thermography	029
thresholds	D149
ticks	026
tomato fruitworm	D062
transgenic crops	D077, D153, 138, D157, 016
trapping	136, 093
turf	094
U	
urban IPM	044
V	
varroa mite	011, 029
vector biology	005, D162
viburnum leaf beetle	097
Vip3A	139
W	
water relations	021, 026
web architecture	D070
weed biological control	131
western bean cutworm	139, 087, 164
western chinch bug	D151
western corn rootworm	084, 138, D066, D157, 166, 167
wheat	D075
wheat curl mite	D076
wheat streak mosaic virus	D076

NCB-ESA Meeting, March 15-18, 2009
St. Louis, Missouri

Next year's North Central Branch meeting will be held in downtown St. Louis (hotel information will be forthcoming), March 15-18, 2009. These dates were selected to avoid conflict with the IPM Symposium being held in Portland, Oregon, the following week. Please plan on joining us next year in the "Gateway City."

Steve Yaninek
NCB President-Elect