

NORTH CENTRAL BRANCH
ENTOMOLOGICAL SOCIETY
OF AMERICA

71ST ANNUAL MEETING
PRESIDENT: LUIS CAÑAS



June 5-8
2016
Cleveland, OH

NORTH CENTRAL BRANCH
ENTOMOLOGICAL SOCIETY OF AMERICA

WYNDHAM CLEVELAND AT PLAYHOUSE SQUARE
1260 EUCLID AVE
CLEVELAND, OH 44115

SPECIAL THANKS
TO OUR MEETING SPONSORS

MONSANTO



Bayer CropScience



Dow AgroSciences

WINFIELD™

syngenta

AMVAC®

FMC

CONTENTS

Meeting Logistics	2
2016 NCB Meeting Organizers	7
2015-16 NCB-ESA Officers and Committees	8
2016 NCB Award Recipients	11
Sunday, June 5, 2016	
Day at a Glance	18
Scientific Sessions	19
Monday, June 6, 2016	
Day at a Glance	23
Scientific Sessions	25
Tuesday, June 7, 2016	
Day at a Glance	44
Scientific Sessions	45
Wednesday, June 8, 2016	
Day at a Glance	58
Scientific Sessions	59
Author Index	65
Taxonomic Index	79
Map of Meeting Facilities	84



REGISTRATION

All participants must register for the meeting. Registration badges are required for admission to all conference functions. The meeting registration desk is located in the 3rd Floor Lobby. Registration will be open for check-in (pre-registered attendees) and for on-site registration at the following times:

Sunday	10:00 AM – 6:00 PM
Monday	7:30 AM – 5:00 PM
Tuesday	7:30 AM – 12:00 PM 1:30 PM – 5:00 PM
Wednesday	7:30 AM – 10:00 AM

REFRESHMENTS

Coffee and tea will be available during morning breaks each day. Light snacks will be served at the Welcome Reception, the Student Mixer and the Poster Mixer. The Awards Luncheon (Tuesday) is included with registration for all participants, and the Student Sponsored Luncheon (Monday) is included with student registration.

MESSAGES, PROGRAM CHANGES, LOST & FOUND

A message board for posting announcements will be displayed near the NCB Meeting Registration Desk. Notices concerning program changes should be submitted to the Meeting Registration Desk. Also, lost and found items may be turned in and retrieved at the Registration Desk.

EMPLOYMENT OPPORTUNITY CENTER

Employers are invited to post job announcements and job seekers are encouraged to post their CVs in the Employment Opportunity Center in Embassy Room which is also the A/V room. Please bring enough copies of your documents for distribution (no photocopy service will be provided).

POSTER PRESENTATIONS

Posters will be displayed in the Prefunction Space (2nd Floor) for the duration of the meeting. All posters (both Student Competition and Regular Submissions) **should be set up Sunday, June 5, between 3:00 PM and 8:00 PM.** All posters

will remain up until **takedown on Wednesday from 10:00 AM to 12:00 PM**. Presenters for Student Competition posters should stand by their poster on Monday, June 6 between 2:00 PM – 2:30 PM (odd numbers) and 2:30 – 3:00 PM (even numbers). Submitted poster presenters should be present on Tuesday, June 7 from 10:00 – 10:30 AM (odd numbers) and 10:30 – 11:00 AM (even numbers). Posters will be mounted according to the signage provided. Presenters must use the special poster-mounting strips provided to avoid damaging wall surfaces. Poster dimensions should not exceed 46x46 inches (117x117cm).

MODERATOR AND STUDENT COMPETITION JUDGE TRAINING

A Moderator and Student Competition Judge training session will be held on Sunday at 4:00 PM in the Embassy Room. Moderators may sign out pointers and timers in the A/V room (Embassy Room) before their sessions.

GUIDELINES FOR SPEAKERS AND MODERATORS

Speakers and moderators will follow standard procedures and practices for ESA meetings. Moderators are responsible for maintaining the printed schedule, by not starting any presentation prior to its scheduled time, and by not allowing a speaker to exceed the allotted time. If a presentation is cancelled, the moderator must wait to begin the next presentation until its scheduled time. If there are problems with the computer/projector, or other equipment, please come to the A/V room (Embassy Room) to request assistance.

Creating and Uploading Presentations: Presentations should be created in a format compatible with MS Office-PowerPoint (.pptx). All presenters (10-minute papers and symposia) should bring their presentation file to the A/V room on a USB memory stick/flash for **uploading at least two hours before their session begins**. Folders with Session or Symposium Names will be provided—please upload your talk in the appropriate folder. Volunteers will be present to provide technical assistance.

To facilitate smooth transitions between presentations, each file must be **saved using the following filename format: PaperNumber – PresenterSurname.pptx**. Presenters are encouraged to **AVOID** using embedded audio and video in

presentations, which could cause the computers to lock up during presentation.

AUDIO/VISUAL EQUIPMENT

All meeting rooms will be equipped with an LCD projector, projector screen, computer, and microphone. The A/V room (Embassy Room) will be equipped with laptops throughout the conference for presenters to load and preview presentations. The A/V room will be open during the NCB Registration Desk hours. All meeting room computers are PCs, so a presenter who creates a presentation using a Macintosh computer should test the file on a PC computer prior to the conference.

NO PHOTOGRAPHS PLEASE

NCB-ESA requests that attendees not take photographs or videos during sessions because they are disruptive to the presenters. If you wish to take photographs of a poster, please contact the poster presenter for permission. NCB-ESA reserves the right to use photographs and videos taken during the meeting for informational and promotional purposes.

DESTINATION CLEVELAND

Onsite materials provided by “Destination Cleveland” will be made available to participants at the registration desk. Download and print the maps at the following link to help you navigate the Cleveland region and find nearby hotels, restaurants and attractions:

<http://www.thisiscleveland.com/planning-tools/maps/>. The following Destination Cleveland partners are offering specials to meeting and convention attendees to make your experience in Cleveland all the more enjoyable. To participate, simply show your conference/convention badge to any of our participating partners listed and receive their exclusive offer. All offers are valid within the 2016 calendar year and are subject to certain restrictions. For more information see:

http://www.thisiscleveland.com/includes/content/docs/media/2016-02-Destination_Cleveland_Show_Your_Badge.pdf.

PLAYHOUSE SQUARE, CLEVELAND OHIO

Playhouse square is a
“...not-for-profit
performing arts center
who presents and
produces a wide
variety of quality
performing arts,
advances arts



PlayhouseSquare®

education and creates a neighborhood that is a superior destination for entertainment, business and residential living, thereby strengthening the economic vitality of the region.”

More information can be found at:

www.playhousesquare.org/

NCB SPONSORED TOURS

(Please sign up at registration desk)

CLEVELAND MUSEUM OF NATURAL HISTORY

<https://www.cmnh.org/>

Travel to the world famous Cleveland Museum of Natural History and visit with Dr. Gavin J. Svenson on a tour of their Invertebrate Zoology collection. At the tour, Dr. Svenson will discuss their collection and how they use it to attract many visitors to the museum. He will also provide detail about the collection holdings, resources at the museum, and the research they are doing. He, of course, will be more than willing to answer any questions the attendees have. Do take advantage of this unique opportunity and check this impressive collection!

Date: Monday, June 6

Time: Depart from the Wyndham lobby at 12:30 pm. Return by 2:30 pm. Actual tour will take 30-45 minutes

Cost: \$10

Number of participants: Maximum 14 people

URBAN AGRICULTURE TOUR

Worldwide, food production within cities is growing rapidly. Cleveland, OH is among the nation’s leaders in the implementation of urban agriculture on formerly-vacant land across urban and suburban communities. This tour will visit urban agricultural sites within Cleveland, providing a chance

for attendees to learn more about the challenges and opportunities provided by this form of local food production.

Date: Tuesday, June 7, from 2:00 – 4:00PM
Time: Depart from the Wyndham lobby at 2:00 pm. Return by 4:00 pm. Actual tour will take 30-45 minutes
Cost: \$15
Number of participants: Maximum 20 people

DOWNTOWN CLEVELAND MAP



**2016 NORTH CENTRAL BRANCH
MEETING ORGANIZERS**



Luis Cañas
President



Andy Michel
Program Chair



Mary Gardiner
Local Arrangements Chair



Jeff Bradshaw
Secretary & Treasurer



Kayla Perry
*Student Rep –
Executive Committee*

2016 NORTH CENTRAL BRANCH

SPECIAL ACKNOWLEDGEMENTS

ADDITIONAL MEETING ORGANIZERS

- Robert Koch: Student Competition Judging and Moderator Coordinator
- Sue Blodgett and Jeff Bradshaw: Meeting Sponsorship Coordinators

SPECIAL THANKS

- ESA Central Staff: David Gammel, Becky Anthony, Katherine Matthews
- Confex Staff, especially Amy Coli for program assistance
- Morgan Klinkradt, ConferenceDirect
- Wyndham Staff, especially Meghan Lukcso, Director of Catering and Clarence C. Barnes, Director of Event Technology
- All of our moderators, Student Competition judges, and student volunteers
- All of our meeting sponsors

2015-2016 NCB-ESA OFFICERS AND COMMITTEES

PRESIDENT

Luis Cañas

PRESIDENT-ELECT

Linda Mason

IMMEDIATE PAST PRESIDENT

Paula Davis

SECRETARY-TREASURER

Jeff Bradshaw

GOVERNING BOARD REPRESENTATIVE

Gary J. Brewer

EXECUTIVE COMMITTEE MEMBERS-AT-LARGE

Deane Kathleen Jorgenson, Jennifer A. White, Robert J. Wright, Kayla Perry (Student Representative)

PROGRAM COMMITTEE

Andy Michel (Chair), Amit Sethi (Past Chair), Carol Anelli, Erin O'Brien, Liu Yang, Carlos Esquivel-Palma and Todd Johnson

LOCAL ARRANGEMENTS COMMITTEE

Mary Gardiner (Chair), David Margolies (Past Chair), Joe Raczowski, Chris Riley, Travis Calkins, Kayla Perry, MaLisa Spring

NOMINATING COMMITTEE

Grayson Brown (Chair), Julie Peterson

AUDIT COMMITTEE

Lamar Buckelew, Matt Carrol and Jonathan Lundgren

STUDENT AWARDS COMMITTEE

Robert Koch (Chair), Clint Pilcher, John Ruberson, Chris Philips, Matt Grieshop, Amit Sethi, Adam Varenhorst, Trisha Leaf (Student Rep)

HONORARY AWARDS COMMITTEE

Kelley Tilmon (Chair), Louis Hesler, Tom Clark, Sarah Zukoff, Erin Bauer, Erin O'Brien

NCB PROFESSIONAL AWARDS COMMITTEE

Kelley Tilmon (Chair), Jarrad Prasifka, Sean Whipple, Dan Herms, Tom Hunt, Shelby Pritchard (Student Rep)

PHOTO SALON COMMITTEE

Tom Myers, BCE (Chair), Ric Bessin, Gary Hein and Dave Voegtlin

STUDENT AFFAIRS COMMITTEE

Kayla Perry (Chair), Rachael Sitz (Vice-Chair), Shelby Pritchard, Jaclyn Eichele, Trisha Leaf, Margie Lund, Joliene Lindholm, Alicia Leroux, Brittani Alexander, Hannah Penn (Treasurer), Sophia Conzemius, Todd Johnson, Ryan Schmid, Adam Alford, Amanda Skidmore, Camila Hofman

NCB LINNAEAN GAMES COMMITTEE

Deane Jorgenson (Gamesmaster), Dan Young (Chair), Marianne Alleyne, David Margolies, Hannah Penn (Student Rep)

NCB-ESA WEBSITE – www.entsoc.org/northcentral

2016 NORTH CENTRAL BRANCH

AWARDS COMMITTEE CHAIRS



Kelley Tilmon
NCB Awards Czar



Robert Koch
*NCB Student
Awards Chair*



2016 ESA NORTH CENTRAL BRANCH *C.V. Riley Achievement Award*

Dr. Marlin Rice



Marlin E. Rice has 33 years experience as an entomologist at Texas A&M University, University of Idaho, Iowa State University, and DuPont Pioneer. At Iowa State, he was professor of entomology and dedicated his academic extension (75%) and research (25%) career to the creative development and innovative delivery of IPM programs. He

has given over 700 extension presentations, authored 105 extension publications, written nearly 750 newsletter articles, and has 91 refereed publications. At Iowa State, he was executive editor of *Integrated Crop Management*, which he transformed into the first full-color, weekly, crops extension newsletter published by a land-grant university. The newsletter was eventually internet-based and during 2007 received over one million page views. He also taught three International Field Trip in Biology classes to Kenya and Tanzania.

His perspectives on Iowa agriculture and entomology have been quoted in the *New York Times*, *USA Today*, *Wall Street Journal*, *Washington Post*, and numerous farming magazines. He co-authored with Larry Pedigo two editions of the textbook *Entomology and Pest Management*. He is a co-editor of the *Handbook of Corn Insects*, and he co-developed with Kevin Steffey the *Journal of Integrated Pest Management*.

Rice has served the Entomological Society of America as Annual Meeting Program Chair, Governing Board Representative, Secretary-Treasurer, and President. He

was elected Fellow for his achievements in extension entomology and Honorary Member for extraordinary service to the Society. He is a contributing editor for *American Entomologist* and writes the column Legends.

Rice received degrees in entomology from University of Missouri (M.S.) and Kansas State University (Ph.D.). In 1998, he was a Fulbright scholar at University of Zimbabwe.

2016 ESA NORTH CENTRAL BRANCH
Distinguished Achievement Award in
Teaching

Dr. Tom Weissling
University of Nebraska-Lincoln,
Lincoln NE



Dr. Tom Weissling is an Associate Professor in the Department of Entomology at the University of Nebraska-Lincoln. His primary responsibilities include teaching and extension. He earned his BS (1984) and MS (1986) degrees in Entomology from Colorado

State University and a Ph.D. (1990) from the University of Nebraska-Lincoln, also in Entomology. Weissling joined the Department of Entomology at UNL in 2006. His teaching responsibilities include coordination of the online MS degree program, providing instruction in a variety of undergraduate and graduate courses, and student advising.

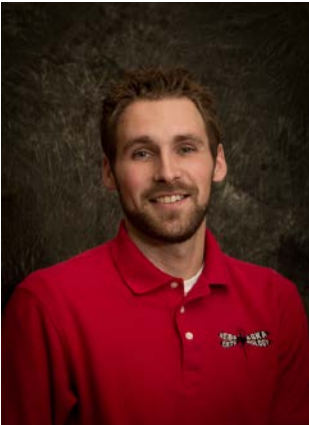
As online coordinator, Weissling has increased graduate student enrollment by 30%, he ensures quality programming, and each semester provides mentoring for the approximately 100 online MS students. In 2015, Weissling was named coordinator of the department's insect science undergraduate degree program, which is currently a major for 18 students. Weissling teaches a variety of online and face-to-face classes focused on insect classification, biology, ecology and pest management. He has also developed new courses that support the insect science program. In addition, Weissling provides co-instruction

and supervision for students enrolled in the insect science, and online MS degree capstone courses.

Weissling's other responsibilities include developing literacy and outreach programs related to arthropod ecology and conservation. His primary focus is documentation of insect diversity on milkweed plants in Nebraska, and is working with graduate students to develop related citizen science projects such as Milkweed Watch

**2016 ESA NORTH CENTRAL BRANCH
*J.H. Comstock Graduate Student Award***

**Anthony McMechan
University of Nebraska-Lincoln**



Anthony "Justin" McMechan received his BS in Agronomy from the University of Minnesota-Crookston in 2009 and his MS in Entomology from the University of Nebraska-Lincoln in 2012. He is currently a candidate of both a PhD in Entomology and the Doctor of Plant Health program at the University of Nebraska-Lincoln under the

supervision of Dr. Gary Hein. The combination of these doctoral programs has allowed Justin to take an interdisciplinary approach to risk assessment of overwintering hosts for the wheat-mite-virus complex. In addition, internships through the DPH program have provided experience in extension programming, incorporation of technologies for disseminating information, and the development of interactive software to demonstrate field-to-field movement of mites and virus. Justin's ultimate goal is to work with growers to develop sustainable solutions through interdisciplinary research of complex agricultural.

**2016 ESA North Central Branch
Graduate Student Scholarship Award**

**Anthony Hanson
University of Minnesota**



Anthony Hanson is a PhD student in the Department of Entomology at the University of Minnesota advised by Dr. Robert Koch. He is broadly focused on biotic and abiotic factors that affect the population dynamics of pests and their natural enemies within integrated pest management. Anthony

grew up on working on a farm in west-central Minnesota. He received his BA in Biology in 2010 from Concordia College in Moorhead, MN and obtained his MS in Entomology on the cold tolerance of emerald ash borer parasitoids with Dr. Rob Venette at the University of Minnesota in 2013. His PhD research focuses on improving ways to find new soybean aphid resistance traits and the soybean breeding process. He also works to better incorporate host-plant resistance with other integrated pest management tactics.

2016 NCB PRESIDENTIAL STUDENT TRAVEL SCHOLARSHIPS

Travis	Calkins	The Ohio State University
Kaitlin	Chapman	University of Nebraska-Lincoln
Molly	Dieterich	The Ohio State University
Jacqueline	Dillard	University of Kentucky
Alexandra	Duffy	Purdue University
Michael	Garvey	Purdue University
Joshua	Gibson	University of Illinois at Urbana-Champaign
Daniel	Gibson	Michigan State University
Thorsten	Hansen	University of Kentucky-
Anthony	Hanson	University of Minnesota
Gabriel	Hughes	Purdue University
Todd	Johnson	University of Illinois at Urbana-Champaign
Dohyup	Kim	University of Illinois at Urbana-Champaign
Camila	Oliveira	University of Nebraska-Lincoln
Hannah	Penn	University of Kentucky
Kayla	Perry	The Ohio State University
Scott	Prajzner	The Ohio State University
Nicole	Quinn	Michigan State University/Virginia Tech Univ.
Christopher	Riley	The Ohio State University
Amanda	Skidmore	University of Kentucky
MaLisa	Spring	The Ohio State University
Margaret	Thairu	University of Illinois Urbana-Champaign

PROGRAM

SUNDAY JUNE 5, 2016: AT A GLANCE

Services	
11:00AM – 6:00PM	Registration; 3 rd Floor Lobby
3:00 PM – 7:00 PM	AV and Employment Opportunity, Embassy Room
Scientific Program	
12:00 PM – 3:00 PM	Symposium: Research Update from the North Central Soybean Research Program (NCSRP); Palace Ballroom East
3:00 PM – 5:00 PM	Symposium: Insect-Microbial Interactions; State Room
3:00 PM – 8:00 PM	Poster setup – All posters (Student Competition and regular submission); Posters will be displayed through Wednesday Prefunction Space
Functions	
2:00 PM – 4:00 PM	Triplehorn Challenge Palace Ballroom West
5:00 PM – 6:00 PM	Judge and Moderator training Embassy Room
4:00 PM – 5:00 PM	Photo Salon: Hippodrome Room
4:00 PM – 7:00 PM	Linnaean Games preliminary round Palace Ballroom East
7:30 PM – 10:00 PM	Opening Remarks (Palace Ballroom West) and Welcome Reception (US Bank Plaza or Ballroom East)
Business	
8:00AM – 12:00PM	NCERA 220:Midwest Biocontrol Working Group Meeting Allen Room
12:30PM – 2:30PM	NCB Executive Committee preliminary meeting, Roxy Room
1:00PM – 3:00PM	NCAC-15/SAC Department Heads Meeting, Stillman Room
3:30PM – 5:00PM	NCSRP Working Group Meeting, Hannah Room

JUNE 5, 2016
SUNDAY AFTERNOON

SYMPOSIUM

**RESEARCH UPDATE FROM THE NORTH
CENTRAL SOYBEAN RESEARCH PROGRAM
(NCSRP)**

12:00 PM – 3:00 PM
PALACE BALLROOM EAST

ORGANIZERS AND MODERATORS:

ADAM VARENHORST, SOUTH DAKOTA STATE UNIVERSITY

DORIS LAGOS-KUTZ, UNIVERSITY OF ILLINOIS

MATT O'NEAL, IOWA STATE UNIVERSITY

- 12:00 PM **Introductory Remarks.**
- 12:05 PM 1 **An Overview of Checkoff-Funded Entomology Research and Outreach with the North Central Soybean Research Program. *Kelley Tilmon* (*tilmon.1@osu.edu*), The Ohio State Univ., Wooster, OH**
- 12:25 PM 2 **Monitoring Regional Aphid Movement Patterns in the Midwest. *Doris Lagos-Kutz* (*dlagos@illinois.edu*)¹, David Voegtlin¹ and Glen L. Hartman², ¹Univ. of Illinois, Urbana, IL, ²National Soybean Research Center, Urbana, IL**
- 12:45 PM 3 **Investigating Rag Virulence Among Soybean Aphid Biotypes in South Dakota. *Swapna R. Purandare* (*Swapna.Purandare@sdstate.edu*)¹ and Kelley Tilmon², ¹South Dakota State Univ., Brookings, SD, ²The Ohio State Univ., Wooster, OH**

1:05 PM 4 **Factors Affecting Population Dynamics of Thrips Vectors of Soybean Vein Necrosis Virus in Soybean. *Punya Nachappa*** (*nachappa@ipfw.edu*)¹, Stacy Keough¹, Jinlong Han¹, Doris Lagos-Kutz² and David Voegtlin², ¹Indiana Univ.-Purdue Univ., Fort Wayne, IN, ²Univ. of Illinois, Urbana, IL

1:25 PM

BREAK

1:40 PM 5 **Pollinator Survey in Midwestern Soybeans: Bees and Syrphid Flies. *JJ. Knodel*** (*janet.knodel@ndsu.edu*)¹, Patrick Beauzay¹, Christian Krupke², Thelma Heidel-Baker³, Ebony Murrell⁴, Bruce D. Potter⁵, Karly Regan⁶, Ada Szczepaniec⁷ and Kelley Tilmon⁸, ¹North Dakota State Univ., Fargo, ND, ²Purdue Univ., West Lafayette, IN, ³Iowa State Univ., Ames, IA, ⁴Univ. of Wisconsin-Madison, Madison, WI, ⁵Univ. of Minnesota, Lamberton, MN, ⁶South Dakota State Univ., Brookings, SD, ⁷Texas A&M Univ., Amarillo, TX, ⁸The Ohio State Univ., Wooster, OH

2:00 PM 6 **Pollinators in Soybean Fields: What Are They Good For? *Matt O'Neal*** (*oneal@iastate.edu*)¹, Amy L. Toth¹, Adam Dolezal¹, Clare I Adams² and Ge Zhang¹, ¹Iowa State Univ., Ames, IA, ²Iowa State Univ., Dept. of Ecology, Evolution, and Organismal Biology (EEOB), Ames, IA

2:20 PM 7 **The Effect of an Interspersed Refuge on Soybean Aphid Management. *Adam Varenhorst*** (*adam.varenhorst@sdstate.edu*)¹ and Matt O'Neal², ¹South Dakota State Univ., Brookings, SD, ²Iowa State Univ., Ames, IA

2:40 PM 8 **From Farms to Genomes: NCSRP and the Soybean Aphid Genome. Jacob Wenger¹, Bryan Cassone², Fabrice Legeai³, J. Spencer Johnston⁴, Raman Bansal⁵, Ashley Yates⁵, Vitor Pavinato⁵, *Andy Michel* (*michel.70@osu.edu*)⁵ and Brad S. Coates⁶, ¹California State Univ., Fresno, Fresno, CA, ²Brandon Univ., Brandon, MB, Canada, ³INRA, Le Rheu, France, ⁴Texas A&M Univ., College Station, TX, ⁵The Ohio State Univ., Wooster, OH, ⁶USDA - ARS, Ames, IA**

SYMPOSIUM
INSECT-MICROBIAL INTERACTIONS

3:00 PM – 5:00 PM

STATE ROOM

ORGANIZER AND MODERATOR:

ZAKEE SABREE, THE OHIO STATE UNIVERSITY

- | | | |
|---|----|---|
| 3:00 PM | 9 | Bacterial Symbiont Transmission in the Fungus-Growing Ant Species Network. <i>Rachelle Adams</i> (<i>adams.1970@osu.edu</i>), The Ohio State Univ., Columbus, OH |
| 3:20 PM | 10 | Gut Symbionts Stimulate Host Gut Epithelial Tissues in a Model Arthropod. <i>Zakee Sabree</i> (<i>sabree.8@osu.edu</i>), Benjamin Jahnes and Sema Osma², The Ohio State Univ., Columbus, OH |
| 3:40 PM | 11 | Strong Spatial-Genetic Congruence between a Wood-Feeding Cockroach and Its Bacterial Endosymbiont, Across a Topographically Complex Landscape. <i>Ryan Garrick</i>, Univ. of Mississippi |
|
<u>4:00 PM</u> <u>BREAK</u> | | |
| 4:20 PM | 12 | Escape from Symbiosis Rabbit Hole: Recent Acquisition of a Functionally Superior Endosymbiont by the Gulf Coast Tick. <i>Rahul Raghavan</i>, Portland State Univ. |
| 4:40 PM | 13 | Host Plant-Induced Metabolic Remodeling in a Model Host-Microbe System is Linked to DNA Methylation Patterns. <i>Allison Hansen</i> (<i>akh@illinois.edu</i>), Univ. of Illinois, Champaign, IL |

OPENING REMARKS AND
WELCOME RECEPTION

7:30 PM – 10:00 PM

**PALACE BALLROOM WEST & US BANK PLAZA (OR
BALLROOM EAST)**

REMARKS BY:

DAVID GAMMEL, ESA EXECUTIVE DIRECTOR

MAY BERENBAUM, ESA 2016 PRESIDENT

ALVIN SIMMONS, ICE 2016 CO-CHAIR

LUIS CAÑAS, ESA-NCB 2016 PRESIDENT

SUNDAY NOTES

MONDAY JUNE 6, 2016: AT A GLANCE

Services	
7:30 AM – 5:00 PM	Registration; 3 rd Floor Lobby
7:30 AM – 5:00 PM	AV/Employment Opportunity Room; Embassy Room
Scientific Program	
8:00 AM – 6:00 PM	Posters Display – All posters (Student Competition and regular submission) on display through Wednesday. Prefunction Space
9:00 AM – 10:19 AM	Ph.D. Student Ten-Minute Paper Competition: P-IE Session, Field Crops; Palace Ballroom East
9:05 AM – 10:17 PM	Ph.D. Student Ten-Minute Paper Competition: MUVE & PBT Session; State Room
9:05 AM – 10:17 AM	Ph.D. Student Ten-Minute Paper Competition: P-IE, SysEB Session: Ecology I; Palace Ballroom West
9:05 AM – 10:05 AM	Undergraduate and M.S. Student Ten-Minute Paper Competition: P-IE Session I; Allen Room
10:35 AM – 11:35 AM	Ph.D. Student Ten-Minute Paper Competition: P-IE, SysEB Session: Ecology II, Allen Room
10:35 AM – 11:35 AM	Undergraduate and M.S. Student Ten-Minute Paper Competition: P-IE Session II; Stillman Room
10:35 AM – 11:35 AM	Undergraduate and M.S. Student Ten-Minute Paper Competition: P-IE Session, Field Crops; State Room

10:35 AM – 11:35 AM	Undergraduate and M.S. Student Ten-Minute Paper Competition, MUVE & PBT; Hanna Room
1:30 PM – 4:35 PM	Symposium: Insects in Human Culture; State Room
1:30 PM– 4:35 PM	Symposium: Insect Vectors of Plant Pathogens; Stillman Room
1:55 PM – 4:15 PM	Symposium: Forest Entomology: Allen Room
Functions	
8:00 AM – 8:50 AM	Opening Session and Preliminary Business Meeting, Stillman Room
12:00 PM – 1:30 PM	Student-Industry Luncheon Palace Ballroom West
4:00 PM – 5:00 PM	Photo Salon Hippodrome Room
5:00 PM – 7:30 PM	Linnaean Games final round Palace Ballroom Full
8:00 PM – 10:30 PM	Student Mixer Hofbrauhaus

JUNE 6, 2016
MONDAY MORNING

STUDENT COMPETITION POSTERS

PRESENTERS FOR STUDENT COMPETITION POSTERS SHOULD STAND
BY THEIR POSTER ON MONDAY, JUNE 6
2:00 PM – 2:30 PM (ODD NUMBERS)
2:30 – 3:00 PM (EVEN NUMBERS)

8:00 AM – 6:00 PM
PREFUNCTION SPACE

STUDENT COMPETITION POSTERS PH.D. – I

- D1 **Potential Predators and Entomopathogens of Western Corn Rootworm in Continuous Cornfields in Nebraska. *Camila Oliveira Hofman* (*coliveirahofman@gmail.com*)¹, Vinícius Suárez Victor², Kayla A. Mollet², Anthony Adesemoye², Lance Meinke¹ and Julie Peterson², ¹Univ. of Nebraska-Lincoln, Dept. of Entomology, Lincoln, NE, ²Univ. of Nebraska-Lincoln, North Platte, NE**
- D2 **Making the Most of a Citizen Science Program: Evaluating and Improving the Pollination Investigators Study. *Alice M. Vossbrinck* (*vossbrinck.1@osu.edu*)¹, Brian M. Kleinke¹, Scott Prajzner¹, Chelsea A. Gordon², Nicole Hoekstra², Andrea Kautz² and Mary Gardiner¹, ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH, ³Carnegie Museum of Natural History, Rector, PA**
- D3 **Uncovering the Genetic Mechanisms of Imidacloprid Resistance in *Leptinotarsa decemlineata* in the Central Sands Region of Wisconsin. *Justin Clements* (*jcllements2@wisc.edu*), Sean Schoville, Nathan Peterson, Que Lan and Russell Groves, Univ. of Wisconsin, Madison, WI**

- D4 **Effects of DuPont™ Lumiderm™ Experimental Seed Treatments on Soybean Aphid on Early Vegetative Soybean. *Matheus Ribeiro* (*matheusgpmr@gmail.com*)¹, Renata Pereira², Blair Siegfried³, Thomas Hunt⁴ and Jeffrey Krumm⁵, ¹Univ. of Nebraska, Lincoln, NE, ²Universidade Federal de Vicosa, Vicosa, MG, ³Univ. of Florida, Gainesville, FL, ⁴Univ. of Nebraska-Lincoln, Concord, NE, ⁵DuPont Crop Protection, Hastings, NE**
- D5 **Linking Forest Management Practices to Increase Oak-Hickory Regeneration to Salamander Predator-Invertebrate Prey Communities. *Michael Graziano* (*mpgraziano@gmail.com*)¹, Sarah Rose², Stephen Matthews¹ and P. Charles Goebel², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH**

STUDENT COMPETITION POSTERS PH.D. – II

- D6 **Rank-based Inference of Pollen Type Abundance Using a Multi-locus, Metabarcoding Approach. *Rodney Richardson* (*richardson.827@osu.edu*)¹, Chia-Hua Lin¹, Juan Pillajo², Natalia Riusech², Douglas Sponsler², Karen Goodell³ and Reed Johnson², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH, ³The Ohio State Univ., Newark, OH**
- D7 **Identification of Monarch Mitochondrial Haplotypes Based on Direct Sequencing. *Kelsey E. Fisher* (*kefisher@iastate.edu*)¹, Brad S. Coates² and Steven P. Bradbury¹, ¹Iowa State Univ., Ames, IA, ²USDA - ARS, Ames, IA**
- D8 **Mud Crickets and Pygmy Mole Crickets (Orthoptera: Caelifera: Tridactyloidea) from Belize. *Nathalie Baena-Bejarano* (*baena2@illinois.edu*)^{1,2}, Sam W. Heads² and Steven Taylor², ¹Dept. of Entomology & Illinois Natural History Survey, Champaign, IL, ²Univ. of Illinois, Champaign, IL**

- D9 **Evaluation of *Rhyzopertha dominica* Population Structure in the United States. *Erick Cordeiro*** (*cordeiro.emg@gmail.com*)¹, James Campbell², Thomas Phillips¹ and Eduard Akhunov³, ¹Kansas State Univ., Manhattan, KS, ²USDA - ARS, Manhattan, KS, ³Dept. of Plant Pathology, Manhattan, KS
- D10 **Forest Disturbance Increased Ground Beetle (Carabidae) Species Diversity. *Kayla I Perry*** (*perry.1864@osu.edu*)¹, Kimberly Wallin^{2,3}, John Wenzel⁴ and Daniel Herms¹, ¹The Ohio State Univ., Wooster, OH, ²USDA - Forest Service, South Burlington, VT, ³Univ. of Vermont, Burlington, VT, ⁴Carnegie Museum of Natural History, Rector, PA

UNDERGRADUATE AND M.S. - I

- D12 **The Value of Urban Greenspaces For Conservation: Ground Beetle (Coleoptera: Carabidae) and Rove Beetle (Coleoptera: Staphylinidae) Communities in Cleveland, Ohio. *Yvan Delgado de la Flor*** (*delgadodelaflor.1@osu.edu*)¹, Mary Gardiner¹ and Caitlin Burkman², ¹The Ohio State Univ., Wooster, OH, ²Ohio State Univ., Wooster, OH
- D13 **Insect Diversity on Three Tree Species on an Urban College Campus. *Mary Eichholz*** (*mary.eichholz@brescia.edu*) and Scott M. Shreve, Brescia Univ., Owensboro, KY
- D14 **Wild Bee Abundance and Diversity on Organic Vegetable Farms in Response to Landscape Factors. *Kathryn Prince*** (*kjprince@wisc.edu*)¹ and Russell Groves¹, ¹Univ. of Wisconsin Madison, Madison, WI.
- D15 **Biogeochemical Interactions between an Invasive Scarab (Japanese Beetle *Popillia japonica* Newman) and its Subterranean Environment. *Garrett Price*** (*price41@purdue.edu*), Michael Scharf, Matthew Ginzel, Douglas Richmond and Brittany Peterson, Purdue Univ., West Lafayette, IN

- D16 **Honey Bee Foraging Patterns in Rural and Urban Landscapes.** Douglas Sponsler¹, Reed Johnson¹ and **Emma Matcham** (matcham2.0@beiglobal.com)², ¹The Ohio State Univ., Wooster, OH, ²The Ohio State Univ., Columbus, OH
- D17 **Back from the Dead? A Re-evaluation of *Trachymyrmex balboai* (Formicidae: Attini)** **Cody R. Cardenas** (cardenas.61@buckeyemail.osu.edu)¹, Alexandria M. DeMillo¹, Ted R. Schultz² and Rachelle Adams¹, ¹The Ohio State Univ., Columbus, OH, ²Smithsonian Institution, Washington, DC

UNDERGRADUATE AND M.S. - II

- D18 **Honey Bee Foraging in Landscapes Contaminated with Neonicotinoids during Soybean Planting.** **Sreelakshmi Suresh** (suresh.39@osu.edu)¹, Chia-Hua Lin¹, Emma Matcham¹, Douglas Sponsler² and Reed Johnson², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH
- D19 ***Melittia cucurbitae* (Squash Vine Borer) Management in Gardens.** **Mike McFarland** (mcfarland.447@osu.edu), The Ohio State Univ., Columbus, OH
- D20 **Biological control of cucumber beetles in cucurbit crops.** **Molly Dieterich Mabin** (dieterich.9@osu.edu)¹, Celeste Welty¹ and Mary Gardiner², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH
- D21 **Determining Acquisition and Retention Periods of *Triticum mosaic virus* by the Wheat Curl Mite, *Aceria tosichella*** Keifer. **Elliot Knoell** (elliotknoell@yahoo.com) and Gary Hein, Univ. of Nebraska-Lincoln, Lincoln, NE
- D22 **Preliminary Assessment of a Sampling Plan for Stink Bugs in Minnesota Soybean.** **Daniela Pezzini** (pezzi004@umn.edu)¹ and Robert Koch¹, ¹Univ. of Minnesota, Saint Paul, MN

JUNE 6, 2016
MONDAY MORNING
STUDENT COMPETITION PAPERS

PH.D. STUDENT TEN-MINUTE PAPER COMPETITION: P-IE
SESSION, FIELD CROPS

PALACE BALLROOM EAST

MODERATOR:

ANA M. VELEZ, UNIVERSITY OF NEBRASKA

- 8:53 AM 14 **Predicting Emergence of Corn Rootworm (*Diabrotica* spp.) Exposed to Bt-RW Traits. Edwin Benkert III (benke017@umn.edu)¹ and Ken Ostlie², ^{1,2} Univ. of Minnesota, Saint Paul, MN**
- 9:05 AM 15 **Making the Most of a Sticky Situation: Determining Precision, Required Sample Size and Scouting Windows for Northern (*Diabrotica barberi*) and Western Corn Rootworm (*Diabrotica virgifera virgifera*) on Sticky Traps. Trisha Leaf (trisha.franz@gmail.com) and Ken Ostlie, Univ. of Minnesota, St. Paul, MN**
- 9:17 AM 16 **The Sun and The Wheat: Potential Factors Reducing Hessian Fly, *Mayetiola destructor* (Diptera: Cecidomyiidae), Attraction to Light Emitting Diodes. Ryan Schmid (rbschmid@ksu.edu)^{1,2}, Darren Snyder^{1,3}, Lee Cohnstaedt^{1,3} and Brian McCornack^{1,2}, ¹Kansas State Univ., Manhattan, KS, ²Plant Biosecurity Cooperative Research Centre, Bruce, Australia, ³USDA - ARS, Manhattan, KS**

- 9:29 AM 17 **Video Tracking to Evaluate Behavior Interactions between Fall Armyworm (*Spodoptera frugiperda*) and Corn Earworm (*Helicoverpa zea*) (Lepidoptera: Noctuidae).** **Debora Goulart Montezano** (*deiagm@gmail.com*)¹, José P. G. F. Silva², Edson Baldin³, Silvana V. Paula-Moraes⁴, Ana Vélez⁵, Julie Peterson¹ and Thomas Hunt⁶,
¹Univ. of Nebraska-Lincoln, North Platte, NE, ^{2,3}São Paulo State Univ., Botucatu, Brazil, ⁴Embrapa Cerrados, Planaltina, Brazil, ⁵Univ. of Nebraska, Lincoln, NE, ⁶Univ. of Nebraska-Lincoln, Concord, NE
- 9:41 AM 18 **Genome-wide Association Mapping of Soybean Aphid Resistance Traits.** **Anthony Hanson** (*hans4022@umn.edu*)¹, Aaron Lorenz², Raman Bansal³, Siddhi Bhusal⁴, Andy Michel³, Louis Hesler⁵, Guo-Liang Jiang⁶, and Robert Koch¹, ¹Univ. of Minnesota, Saint Paul, MN, ²Univ. of Minnesota, Dept. of Agronomy and Plant Genetics, St. Paul, MN, ³The Ohio State Univ., Wooster, OH, ⁴South Dakota State Univ., Brookings, SD, ⁵USDA - ARS, Brookings, SD, ⁶Virginia State Univ. Agricultural Research Station, Petersburg, VA
- 9:53 AM 19 **Identifying Changes in Gene Expression that May Promote Virulence in the Soybean Aphid, *Aphis glycines*.** **Ashley Yates** (*yates.229@buckeyemail.osu.edu*), Raman Bansal, Vitor Pavinato and Andrew Michel, The Ohio State Univ., Wooster, OH
- 10:05 AM 20 **Differential Expression of Soybean Defense Genes to the Soybean Aphid (*Aphis glycines*).** **Kaitlin Chapman** (*Karmit.chapman@gmail.com*), Joe Louis and Tiffany Heng-Moss, Univ. of Nebraska-Lincoln, Lincoln, NE

PH.D. STUDENT TEN-MINUTE PAPER COMPETITION: MUVE & PBT SESSION

STATE ROOM

MODERATOR:

RODNEY RICHARDSON, THE OHIO STATE UNIVERSITY

- 9:05 AM 21 **Evaluation of Odor-Z-Way as a Grain Protectant Against Adults of Five Stored-Wheat Insect Species.** *Kouame Yao* (*kdyao@ksu.edu*), Bhadriraju Subramanyam, Kun Yan Zhu and David Hagstrum, Kansas State Univ., Manhattan, KS
- 9:17 AM 22 **Attraction Response of the Lone Star Tick, *Amblyomma americanum*, to Male and Female Breath in a Binary Choice Assay.** *Tanya Josek* (*tanyajosek@gmail.com*)¹, Allison Gardner¹, Tyler Hedlund², Allison Parker¹, Erin Allmann² and Brian F. Allan¹, ¹Univ. of Illinois, Champaign, IL, ²Univ. of Illinois, Urbana, IL
- 9:29 AM 23 **Assessment of Southern Corn Rootworm Adult Emergence from Exposure to RNAi.** *Adriano Pereira* (*aelias374@yahoo.com.br*)¹, Lance Meinke² and Blair Siegfried³, ^{1,2}Univ. of Nebraska-Lincoln, Lincoln, NE, ³Univ. of Florida, Gainesville, FL
- 9:41 AM 24 **A Role of Gap Junctions in Mosquito Blood Meal Processing.** *Travis Calkins* (*calkins.21@osu.edu*) and Peter Piermarini, The Ohio State Univ., Wooster, OH
- 9:53 AM 25 **Understanding the Mechanism of Epigenetic Changes from Host-plant Specificity under Pea Aphid Symbiosis System.** *Dohyup Kim* (*dkim291@illinois.edu*), Univ. of Illinois, Champaign, IL
- 10:05 AM 26 **Tissue Specific Expression Analysis of CYP3 clan P450 Genes and RNAi in Brown Marmorated Stink Bug, *Halyomorpha halys*.** *Priyanka Mittapelly* (*mittapelly.1@buckeyemail.osu.edu*), Raman Bansal and Andrew Michel, The Ohio State Univ., Wooster, OH

**PH.D. STUDENT TEN-MINUTE PAPER COMPETITION: P-IE,
SYSEB SESSION: ECOLOGY I**

PALACE BALLROOM WEST

MODERATOR:

ANDREA KAUTZ, POWDERMILL NATURE RESERVE

- | | | |
|---------|-----|---|
| 8:53 AM | 144 | Plant-Grasshopper (Acrididae) Network Structure Changes with Fire and Grazing. <i>Ellen Welti</i> (elwelti@k-state.edu), Fan Qiu, Hannah Tetreault, Mark Ungerer and Anthony Joern, Kansas State Univ., Manhattan, KS |
| 9:05 AM | 27 | Influence of Neonicotinoid Seed Treatments on Ant Communities and Predation Services in Soybeans. <i>Hannah J. Penn</i> (hannahjpenn@gmail.com), Andrew Dale and James Harwood, Univ. of Kentucky, Lexington, KY |
| 9:17 AM | 28 | Changes in the Wolf Spider (Lycosidae) Community in Post-Wildfire Jack Pine Forests of Northern Lower Michigan. <i>Sarah Rose</i> (rose.891@osu.edu)¹ and P. Charles Goebel, ¹Ohio State Univ., Wooster, OH |
| 9:29 AM | 29 | Delayed Juvenile Dispersal and Female Promiscuity in a Socially Monogamous, Family Living Beetle. <i>Jacqueline Dillard</i> (jdillard2112@gmail.com), Univ. of Kentucky, Lexington, KY |
| 9:41 AM | 30 | Comparative Functional Morphology and Kinematics of Miniature Trap-jaw Ant (<i>Strumigenys</i> spp.) Mandible Strikes. <i>Josh Gibson</i> (jcgibso2@illinois.edu)¹, Doug Booher² and Andrew Suarez¹, ¹Univ. of Illinois, Champaign, IL, ²Univ. of California, Los Angeles, CA |
| 9:53 AM | 31 | Burning Bush (<i>Euonymus alatus</i>) Alters Associated Spider Assemblages through Modifications of Vegetation Structure. <i>Elizabeth Roberson</i> (esancomb14@gmail.com) and Don Cipollini, Wright State Univ., Dayton, OH |

- 10:05 AM 32 **Does Urbanization Influence Heavy Metal Exposure in the Common Eastern Bumble Bee (*Bombus impatiens*)?** *Scott Prajzner* (*prajzner.1@osu.edu*) and Mary Gardiner, The Ohio State Univ., Wooster, OH

**UNDERGRADUATE AND M.S. STUDENT TEN-MINUTE PAPER
COMPETITION: P-IE SESSION I**

ALLEN ROOM

MODERATOR:

KATRINA LUSTOFIN, MARIETTA COLLEGE

- 9:05 AM 33 **Wild Bee Abundance and Diversity in Wisconsin Vegetable Crops.** *Kathryn Prince* (*kjprince@wisc.edu*)¹ and Russell Groves²,
^{1,2}Univ. of Wisconsin Madison, Madison, WI
- 9:17 AM 34 **Just How Valuable Is the Urban Forest Found on Cleveland's Vacant Lots?** *Christopher B. Riley* (*riley.595@osu.edu*)¹, Daniel Herms² and Mary Gardiner², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH
- 9:29 AM 35 **Cattle Grazing Practices Influence Dung Beetle Communities on Rangeland.** *Patrick Wagner* (*pwagner@huskers.unl.edu*)¹, Jeffrey Bradshaw² and Martha Mamo¹, ¹Univ. of Nebraska, Lincoln, NE, ²Univ. of Nebraska-Lincoln, Scottsbluff, NE
- 9:41 AM 36 **Prey Suitability Determines Behavioral Response in a Coccinellid Predator.** *Kelly Jackson* (*kellyj712@gmail.com*), Allison Dehnel and Jennifer A. White, Univ. of Kentucky, Lexington, KY
- 9:53 AM 37 **Michigan Native Plants for Natural Enemy Insectary Plantings.** *Dan Gibson* (*gibso124@msu.edu*) and Douglas A. Landis, Michigan State Univ., East Lansing, MI

STUDENT SESSION COFFEE BREAK

10:10 AM-10:35

UNDERGRADUATE AND M.S. STUDENT TEN-MINUTE PAPER COMPETITION: P-IE SESSION II

STILLMAN ROOM

MODERATOR:

VITOR AC PAVINATO, THE OHIO STATE UNIVERSITY

- 10:35 AM 38 **Urban Landscape Heterogeneity Influences Green Space Value for Cavity Nesting Bees and Wasps. *Katherine Todd*** (*todd.489@osu.edu*) and Mary Gardiner, The Ohio State Univ., Wooster, OH
- 10:47 AM 39 **Curculionid Beetles as Phoretic Vectors of *Geosmithia morbida* - the Causal Agent of Thousand Cankers Disease. *Tyler Stewart*** (*stewar23@purdue.edu*)¹, Margaret McDermott², Jennifer Juzwik³ and Matthew Ginzel¹, ¹Purdue Univ., West Lafayette, IN, ²Univ. of Minnesota, Saint Paul, MN, ³USDA - Forest Service, St. Paul, MN
- 10:59 AM 40 **Creating Greenspace with Multiple Ecosystem Services: Rain Gardens as a Case Study. *MaLisa Spring*** (*malisa.spring@gmail.com*)¹, Sandra Albro², Rob Darner³, Ahjond Garmestani⁴, William Shuster⁴ and Mary Gardiner¹, ¹The Ohio State Univ., Wooster, OH, ²Cleveland Botanical Garden, Cleveland, OH, ³United States Geological Survey, Columbus, OH, ⁴Environmental Protection Agency, Cincinnati, OH
- 11:11 AM 41 **Functional Response of a Generalist Predator to *Halyomorpha halys*. *Kristin Poley*** (*deroshia@msu.edu*) and Matt Grieshop, Michigan State Univ., East Lansing, MI

- 11:23 AM 42 **Identifying Floral Hosts of Cerambycid Beetles Using Palynology.** *Alexander Hazel* (*xhazel@illinois.edu*) and Lawrence M. Hanks, Univ. of Illinois at Urbana-Champaign, Urbana, IL

**UNDERGRADUATE AND M.S. STUDENT TEN-MINUTE PAPER
COMPETITION: P-IE SESSION, FIELD CROPS**

STATE ROOM

MODERATOR:

KELLEY TILMON, THE OHIO STATE UNIVERSITY

- 10:35 AM 43 **Neonicotinoid Detections in Wisconsin Groundwater; Implications for Pollinator Health.** *Benjamin Bradford* (*bbradford@wisc.edu*) and Russell Groves, Univ. of Wisconsin, Madison, WI
- 10:47 AM 44 **Influence of Neonicotinoid Seed Treated Soybean on Two Co-occurring Non-target Arthropod Pests, Two-Spotted Spider Mite (*Tetranychus urticae*) and Western Flower Thrips (*Frankliniella occidentalis*).** *Robert Brenner* (*robert.brenner@ndsu.edu*) and Deirdre Prischmann-Voldseth, North Dakota State Univ., Fargo, ND
- 10:59 AM 45 **Field Survey and Feeding Trials for Arthropod Predators of Western Bean Cutworm *Striacosta albicosta*.** *Westen Archibald* (*Westen.archibald@gmail.com*)¹, Robert Wright¹ and Julie Peterson², ¹Univ. of Nebraska-Lincoln, Lincoln, NE, ²Univ. of Nebraska-Lincoln, North Platte, NE
- 11:11 AM 46 **Spatial Distribution and Development of Sampling Plans for *Harmonia axyridis* and *Orius insidiosus* in Soybean Fields.** *Anh K. Tran* (*aktran@umn.edu*)¹ and Robert Koch², ^{1,2}Univ. of Minnesota, Saint Paul, MN

- 11:23 AM 47 **Effect of Soybean Trichome Density on Biotype-1 Soybean Aphid (*Aphis glycines*) and Its Natural Enemies. *Shelby Pritchard* (*srp@iastate.edu*)¹, Matt O'Neal¹, Arti Singh¹, Asheesh Singh¹ and Adam Varenhorst², ¹Iowa State Univ., Ames, IA, ²South Dakota State Univ., Brookings, SD**

UNDERGRADUATE AND M.S. STUDENT TEN-MINUTE PAPER COMPETITION, MUVE & PBT

HANNA ROOM

MODERATOR:

ELIZABETH LONG, THE OHIO STATE UNIVERSITY

- 10:35 AM 48 **Nutritional Immunology and the *Drosophila-Macrocheles* Mite System: Does Ectoparasitism Induce Host Compensatory Feeding? *Lauren Titus* (*titusle@mail.uc.edu*)¹ and Michal Polak², ^{1,2}Univ. of Cincinnati, Cincinnati, OH**
- 10:47 AM 49 **Cumulative Oxygen Consumption During Development of Two Postharvest Pests (*Callosobruchus maculatus* Fabricius and *Plodia interpunctella* Huebner). *Hannah Quellhorst* (*hquellho@purdue.edu*)¹, Dieudonne Baributsa², Scott Williams² and Larry Murdock², ¹Purdue Improved Crop Storage, West Lafayette, IN, ²Purdue Univ., West Lafayette, IN**
- 10:59 AM 50 **Transcriptomic Approaches to Elucidate Symbiont-mediated Mechanisms of Host Plant Specialization in an Aphid Pest. *Thorsten Hansen* (*teha237@g.uky.edu*)¹ and Jennifer A. White², ^{1,2}Univ. of Kentucky, Lexington, KY**

- 11:11 AM 51 **Volatile and Tactile Chemical Cues Associated with Billbug (Coleoptera: Curculionidae) Behavior in Managed Turfgrass.** *Alexandra Duffy* (*duffy14@purdue.edu*), Gabriel Hughes, Matthew Ginzel and Douglas Richmond, Purdue Univ., West Lafayette, IN
- 11:23 AM 52 **Attraction of Walnut Twig Beetle (*Pityophthorus juglandis*) to Plant and Fungal Volatiles for Improved Monitoring and Detection of Thousand Cankers Disease.** *Bridget Blood* (*bblood@purdue.edu*)¹, Denita Hadziabdic², William Klingeman³ and Matthew Ginzel¹, ¹Purdue Univ., West Lafayette, IN, ^{2,3}Univ. of Tennessee, Knoxville, TN

**PH.D. STUDENT TEN-MINUTE PAPER COMPETITION: P-IE,
SYSEB SESSION: ECOLOGY II**

ALLEN ROOM

MODERATOR:

MD EMRAN ALI, THE OHIO STATE UNIVERSITY

- 10:35 AM 53 **Sulcatone and Sulcatol as Pheromone Components of Cerambycid Beetles in the Subfamily Lamiinae.** *Linnea R. Meier* (*linrmeier@gmail.com*)¹, Judy A. Mongold-Diers¹, Yunfan Zou², Jocelyn G. Millar² and Lawrence M. Hanks³, ¹Univ. of Illinois, Champaign, IL, ²Univ. of California, Riverside, CA, ³Univ. of Illinois at Urbana-Champaign, Urbana, IL
- 10:47 AM 54 **Disease Description of Drippy Blight: A Unique Association between the Scale Insect *Allokermes rattani* and a Pathogenic Bacterium.** *Rachael Sitz* (*rachael.fithian@colostate.edu*), Ned Tisserat and Whitney Cranshaw, Colorado State Univ., Fort Collins, CO

- 10:59 AM 55 **Can Clusters of Treated Ash Trees Protect Untreated Ash and Maintain Reproduction in Forests Invaded by Emerald Ash Borer?** *Erin M. O'Brien* (*obrien.501@osu.edu*) and Daniel Herms, The Ohio State Univ., Wooster, OH
- 11:11 AM 56 **Determination of the Distribution and Factors Predicting Emerald Ash Borer (*Agrilus planipennis*) Infestation in White Fringetrees (*Chionanthus virginicus*).** *Donnie Peterson* (*peterson.143@wright.edu*) and Don Cipollini, Wright State Univ., Dayton, OH
- 11:23 AM 57 **Visual Cues, Tree Diameter, and Edge Effects Influence Response to a Chemical Cue by a Cerambycid Beetle and Associated Insects.** *Todd Johnson* (*tdjohns2@illinois.edu*), Elizabeth Hanson, Allen Yu and Lawrence M. Hanks, Univ. of Illinois at Urbana-Champaign, Urbana, IL

MONDAY MORNING NOTES

JUNE 6, 2016
MONDAY AFTERNOON

SYMPOSIUM

INSECTS IN HUMAN CULTURE

1:30 PM – 4:55 PM

STATE ROOM

ORGANIZERS AND MODERATORS:

CAROL ANELLI, THE OHIO STATE UNIVERSITY

MALISA SPRING, THE OHIO STATE UNIVERSITY

- 1:30 PM Introductory Remarks
- 1:35 PM 58 **Life, Death, and Land Shrimp. *Florence Dunkel*** (*fdunkel@montana.edu*), Montana State Univ., Bozeman, MT
- 1:55 PM 59 **What Hissing Cockroaches Can Do for K-12 Students: Using Insects to Draw Students into Science. *Katy Lustofin*** (*ksl002@marietta.edu*), Marietta College, Marietta, OH
- 2:15 PM 60 **Adventures in Entomophagy: Waiter, There's NO Fly in My Soup!. *David Gordon*** (*thebugchef@davidgeorgegordon.com*), The Bug Chef, Seattle, WA
- 2:35 PM 61 **Insects in Science Teaching: From Adaptation to Zoogeography, Using Insects as Accessible Examples of Biological Phenomena in the Classroom and the Field. *Dave McShaffrey*** (*mcshaffd@marietta.edu*), Marietta College, Marietta, OH
- 2:55 PM** **Break**
- 3:15 PM 62 **The Art and Science of Fly Fishing.....and Fly Tying. *Lowell Nault*** (*bugmanosu@gmail.com*), The Ohio State Univ., Wooster, OH

- | | | |
|---------|-----|---|
| 3:35 PM | 63 | Interdisciplinary Teaching Using Silk Scarves, Cochineal Dye, and Beeswax Batik. <i>Carol Anelli</i> (<i>anelli.7@osu.edu</i>), The Ohio State Univ., Columbus, OH |
| 3:55 PM | 64 | Big and Small Bugs on the Big and Small Screen. <i>May Berenbaum</i> (<i>maybe@illinois.edu</i>), Univ. of Illinois, Champaign, IL |
| 4:15 PM | 65 | Flee Wikkyd Heires: Fleas and the Biology of the Bubonic Plague. <i>Susan Fisher</i> (<i>fisher.14@osu.edu</i>), The Ohio State Univ., Columbus, OH |
| 4:35 PM | 153 | Bugs, Birds and Business: How Caterpillars and Midges Support a Multimillion Dollar Industry. <i>Dave Horn</i> (<i>davehorn43@gmail.com</i>), The Ohio State Univ., Columbus, OH |

SYMPOSIUM

INSECT VECTORS OF PLANT PATHOGENS

1:30 PM – 4:35 PM

STILLMAN ROOM

ORGANIZERS AND MODERATORS:

LUCY STEWART, USDA-ARS, WOOSTER, OH

ANDY MICHEL, THE OHIO STATE UNIVERSITY

- | | | |
|---------|----|---|
| 1:35 PM | 66 | Food Security by 2050: Insect Vectors of Plant Pathogens. <i>Wayne Hunter</i> (<i>wayne.hunter@ars.usda.gov</i>)¹ and Xiomara Sinisterra², ¹USDA - ARS, Ft. Pierce, FL, ²USDA, ARS, U.S. Horticultural Res. Lab, Fort Pierce, FL |
| 1:55 PM | 67 | Direct Effects of Predators on an Aphid Vector of Barley and Cereal Yellow Dwarf Viruses. <i>Elizabeth Long</i> (<i>long.1541@osu.edu</i>), Ohio State Univ. Dept. of Entomology, Wooster, OH |

- 2:15 PM 68 **Plant Nutrient Status and Defense Signaling Modulate the Interaction between Water Stress, Aphids and Virus Transmission in Soybean. *Punya Nachappa*** (*nachappa@ipfw.edu*)¹, Christopher Culkin², Peter Saya¹ and Vamsi Nalam¹, ¹Indiana Univ.-Purdue Univ., Fort Wayne, IN, ²Agdia, Inc, Elkhart, IN
- 2:35 PM 69 **Examining Vector-pathogen-host Plant Interactions: Insights from a Virus and Bacterium. *Laura Ingwell*** (*laura.ingwell@gmail.com*)¹, Nilsa Bosque-Perez² and Ian Kaplan¹, ¹Purdue Univ., West Lafayette, IN, ²Plant, Soil and Entomological Sciences, Univ. of Idaho, Moscow, ID
- 2:55 PM** **Break**
- 3:15 PM 70 **Pathogen Transmission Dynamics of Beetles. *Bryan Cassone*** (*cassoneb@brandonu.ca*)¹, Charlotte Smith² and Cassidy Gedling³, ¹Brandon Univ., Brandon, MB, Canada, ²Dept. of Biology, Brandon Univ., Brandon, ³Ohio State Univ. Dept. of Plant Pathology, Wooster, OH
- 3:35 PM 71 **Maize Virus Transmission by Leafhoppers. *Lucy Stewart*** (*lucy.stewart@ars.usda.gov*)¹, Bryan Cassone², Fiorella Cisneros Carter³, Jane Todd⁴, Saranga Wijeratne³ and Margaret Redinbaugh⁴, ^{1,4}USDA-ARS, Wooster, OH, ²Brandon Univ., Brandon, MB, Canada, ³Molecular and Cellular Imaging Center, The Ohio State Univ., Wooster, OH
- 3:55 PM 72 **Complexity of Virus Transmission to Wheat by the Wheat Curl Mite, *Aceria tosichella*. *Gary Hein*** (*GHEIN1@unl.edu*)¹, Anthony J. McMechan¹, Everlyne Wosula¹ and Camila Oliveira Hofman², ¹Univ. of Nebraska-Lincoln, Lincoln, NE, ²Univ. of Nebraska, Lincoln Dept. of Entomology, Lincoln, NE
- 4:15 PM 73 **Advances in Understanding of Thrips Transmission of Tospoviruses. *Anna Whitfield*** (*aewtospo@ksu.edu*) and Dorith Rotenberg, Kansas State Univ., Manhattan, KS

SYMPOSIUM

FOREST ENTOMOLOGY

1:55 PM – 4:15 PM

ALLEN ROOM

ORGANIZERS AND MODERATORS:

TODD JOHNSON, UNIVERSITY OF ILLINOIS

KAYLA PERRY, THE OHIO STATE UNIVERSITY

- 1:55 PM 74 **Interactions between the Invasive Asiatic Oak Weevil and Native Lepidoptera in Missouri.** *Robert Marquis* (*robert_marquis@umsl.edu*), Christina Baer and Sherry Wibben, Univ. of Missouri, St. Louis, MO
- 2:15 PM 75 **Cerambycid Beetles in Urban Forests: Diversity and Movement.** *Vincent D'Amico* (*vdamico@fs.fed.us*)¹, Judith A. Hough-Goldstein², Emily Dunn², Lawrence M. Hanks³, Jocelyn G. Millar⁴ and Zachary Ladin², ¹USDA - Forest Service, Newark, DE, ²Univ. of Delaware, Newark, DE, ³Univ. of Illinois at Urbana-Champaign, Urbana, IL, ⁴Univ. of California, Riverside, CA
- 2:35 PM 76 **Ecology and Multitrophic Interactions of Microbial Symbionts of the Asian Longhorned Beetle.** *Charles Mason* (*cjm360@psu.edu*), Pennsylvania State Univ., Univ. Park, PA
- 2:55 PM** **Break**
- 3:15 PM 77 **From Genomes to Pheromones: The Olfactory Gene Families of the Asian Longhorned Beetle and Emerald Ash Borer May Yield New Methods of Control.** *Robert Mitchell* (*mitchellr@uwosh.edu*)¹, Adam Schwartz¹ and Duane D. McKenna², ¹Univ. of Wisconsin-Oshkosh, Dept. of Biology, ²Univ. of Memphis, Memphis, TN

- 3:35 PM 78 **Direct and Indirect Ecological Impacts of Emerald Ash Borer and Ash Mortality. *Daniel Herms* (*herms.2@osu.edu*), The Ohio State Univ., Wooster, OH**
- 3:55 PM 79 **Progress and Gaps in Understanding Mechanisms of Ash Tree Resistance to Emerald Ash Borer, a Model for Wood-boring Insects That Kill Angiosperms. *Caterina Villari* (*villari.2@osu.edu*)¹, Daniel Herms², Justin G. A. Whitehill³, Chad M. Rigsby⁴, Don Cipollini⁴, David Showalter¹ and Pierluigi Bonello¹, ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH, ³Univ. of British Columbia, Vancouver, BC, Canada, ⁴Wright State Univ., Dayton, OH**

MONDAY AFTERNOON NOTES

TUESDAY JUNE 7, 2016: AT A GLANCE

Services	
7:30 AM –12:00 PM	Registration, 3 rd Floor Lobby Room
1:30 PM – 5:00 PM	
7:30 AM – 7:00 PM	AV/Employment Opportunity Room Embassy Room
Scientific Program	
8:00 AM – 5:00 PM	Posters Display – All posters (student and regular submission) on display through Wednesday Prefunction Space
8:20 AM – 11:50 AM	Symposium: Novel Insect Control Mechanisms; State Room
8:35 AM – 11:55 AM	Symposium: From basic to applied science: Tri-trophic interactions in natural and managed systems; Stillman Room
1:30 PM – 5:25 PM	Symposium: Pollinator Landscape Ecology, State Room
1:30 PM – 5:30 PM	Symposium: Invasion Biology and Biological Control: Two Great Fields That Go Great Together, Stillman Room
1:35 PM – 4:10 PM	Symposium: Early-career investigators in Insect Physiology, Biochemistry, Toxicology, and Molecular Biology; Allen Room
Functions	
12:00 PM – 1:30 PM	Awards Luncheon, Palace Ballroom
5:00 PM- 7:00 PM	Poster Viewing Mixer, Prefunction Space

JUNE 7, 2016

TUESDAY

REGULAR SUBMITTED POSTERS

PRESENTERS FOR POSTERS SHOULD STAND BY THEIR POSTER ON

TUESDAY, JUNE 7

10:00 AM – 10:30 AM (ODD NUMBERS)

10:30 AM – 11:00 AM (EVEN NUMBERS)

- D23 **The Influence of Soil Nutrients and Metal Burdens on Community Composition in Urban Vacant Lots.** *Nicole Hoekstra* (*hoekstra.10@osu.edu*) and Mary Gardiner, The Ohio State Univ., Wooster, OH
- D24 **Macroinvertebrates.org: An Online Identification Tool for Aquatic Macroinvertebrates Created with Gigapixel Image Technology.** *Andrea Kautz* (*kautza@carnegiemnh.org*)¹, Marti Louw², John Morse³, Madeline Genco³ and John Wenzel¹, ¹Carnegie Museum of Natural History, Rector, PA, ²Center for Learning in Out-of-School Environments, Pittsburgh, PA, ³Clemson Univ., Clemson, SC
- D25 **Effects of Shrub Crop Composition and Mowing on Insect Distributions in a New Diverse Agroforestry System.** *Adam Kranz* (*akrnz@illinois.edu*), Univ. of Illinois Urbana Champaign, Urbana, IL
- D26 **Toxicity of Insecticides Commonly Used in Corn and Soybean Production on Monarch Butterfly (*Danaus plexippus*) Larvae.** *Niranjana Krishnan* (*nkrish@iastate.edu*)¹, Keith Bidne², Joel R. Coats¹ and Steven P. Bradbury¹, ¹Iowa State Univ., Ames, IA, ²USDA - ARS, Ames, IA
- D27 **Trojan Horse or Helpful Ally? How Fungus Growing Ants Perceive Their Social Parasite.** Alexandria M. DeMillo¹, Stefanie Neupert², Falko Drijfhout³, Simon Speller³, David Nash⁴ and *Rachelle Adams* (*adams.1970@osu.edu*)¹, ¹The Ohio State Univ., Columbus, OH, ²Univ. of Konstanz, Konstanz, ³Keele Univ., Keele, United Kingdom, ⁴Univ. of Copenhagen, Copenhagen, Denmark

- D28 **Discovery and Characterization of Single Nucleotide Polymorphisms in Antarctic Midge, *Belgica antarctica* (Diptera: Chironomidae). Vitor Pavinato**
(*correapavinato.1@osu.edu*)¹, Drew Spacht², David L. Denlinger² and Andrew Michel¹, ¹The Ohio State Univ., Wooster, OH, ²The Ohio State Univ., Columbus, OH
- D29 **The Role of HATs and HDACs in *Sarcophaga bullata* Diapause Phenotype. Robin Bautista Jimenez**
(*bautista-jimenez.1@osu.edu*), Julie Reynolds and David L. Denlinger, The Ohio State Univ., Columbus, OH
- D30 **Comparing Ant Community Structure, Species Richness, and Predatory Behavior in Conventionally Managed and Organic Certified Apple Orchards in Michigan. Hailey Schurr** (*hirschurr@umich.edu*), Univ. of Michigan, Ann Arbor, MI
- D31 **Effects of DuPont™ Lumiderm™ Experimental Seed Treatments on Bean Leaf Beetle Injury to Seedling Soybean.** Renata Pereira¹, Matheus Ribeiro², Blair Siegfried³, **Thomas Hunt** (*thunt2@unl.edu*)⁴ and Jeffrey Krumm⁵, ¹Universidade Federal de Vicosa, Viçosa, ²Univ. of Nebraska, Lincoln, NE, ³Univ. of Florida, Gainesville, FL, ⁴Univ. of Nebraska-Lincoln, Concord, NE, ⁵DuPont Crop Protection, Hastings, NE
- D32 **Exploring Insects as Food: Development and Evaluation Of an Introductory Entomophagy Curriculum. Ashley L. Kulhanek**
(*kulhanek.5@osu.edu*)¹, James Jasinski², Kate Shumaker³ and Dr. Jeffrey Cohen⁴, ¹The Ohio State Univ. Extension, Medina, OH, ²The Ohio State Univ., Urbana, OH, ³The Ohio State Univ. Extension, Millersburg, OH, ⁴The Ohio State Univ., Dept. of Anthropology, Columbus, OH
- D33 **Thermal tolerance of the Brown Wheat Mite, *Petrobia latens*, a pest of Winter Wheat. Rachael Sitz**
(*rachael.fithian@colostate.edu*), Emily Luna, Whitney Cranshaw and Frank B. Peairs, Colorado State Univ., Fort Collins, CO

- D34 **Developing management recommendations for the use of seed treatments for soybeans in South Dakota.** *Mike W. Dunbar* (*dunbar@iastate.edu*)¹, Adam Varenhorst², Febina Mathew² and Jonathan Kleinjan², ¹Iowa State Univ., Ames IA, ²South Dakota State Univ., Brookings, SD
- D35 **Effects of Lead Contamination in Sunflowers on Pollinator Behavior.** *Frances S. Sivakoff* (*sivakoff.3@osu.edu*) and Mary Gardiner, The Ohio State Univ., Wooster, OH

TUESDAY MORNING

SYMPOSIUM

NOVEL INSECT CONTROL MECHANISMS

8:20 AM – 11:50 AM

STATE ROOM

ORGANIZERS AND MODERATORS:

ANDY MICHEL, ASHLEY YATES, & PRIYANKA MITTAPELLY
THE OHIO STATE UNIVERSITY

- 8:20 AM 80 **Modification of a Bt Toxin for Toxicity Against Soybean Aphid, *Aphis glycines* Matsumura.** *Biviana Flores-Escobar* (*biviana@iastate.edu*), Benjamin Deist, Maria Fernandez-Luna, Nanasaheb Chougule and Bryony Bonning, Iowa State Univ., Ames, IA

- 8:40 AM 81 **RNAi Using Aerosolized siRNA and Nanoparticles in Aphids. Margaret W. Thairu** (*thairu2@illinois.edu*)¹, Hongmei Li-Byarlay², Raman Bansal³, I Skidmore¹, E Nováková⁴, T. E. Hansen⁵, Samuel Wickline⁶ and Allison Hansen⁷, ¹Univ. of Illinois, Dept. of Entomology, Urbana, IL, ²North Carolina State Univ., Raleigh, NC, ³The Ohio State Univ., Wooster, OH, ⁴Dept. of Parasitology, Faculty of Science, Univ. of South Bohemia and Institute of Parasitology, Ceske Budejovice, ⁵Univ. of Kentucky, Dept. of Entomology, Lexington, KY, ⁶Washington Univ., School of Medicine, St. Louis, MO, ⁷Univ. of Illinois, Champaign, IL
- 9:00 AM 82 **Viruses as Tools for Gene Discovery in Soybean and Soybean Aphid. Md. Emran Ali** (*ali.460@osu.edu*)¹, Ashley Yates¹, Rouf Mian³, John Finer⁴, Anne Dorrance^{1,2}, Andy Michel^{1,5} and Feng Qu^{1,2}, ¹Center for Applied Plant Sciences, The Ohio State Univ., Wooster, OH, ²Dept. of Plant Pathology, The Ohio State Univ., Wooster, OH, ³USDA-ARS, Raleigh, NC, ⁴Dept. of Horticulture and Crop Sciences, The Ohio State Univ., Wooster, OH, ⁵Dept of Entomology, The Ohio State Univ., Wooster, OH
- 9:20 AM** **Break**
- 9:35 AM 83 **Evaluating Soybean Germplasm for Resistance to *Halyomorpha halys*. Jonathan LaMantia** (*Jonathan.LaMantia@ARS.USDA.GOV*)¹, Chris Nacci¹, Kelly Barriball¹, Natalie Geitgey¹, Rouf Mian² and Margaret Redinbaugh¹, ¹USDA-ARS, Wooster, OH, ²USDA-ARS, Raleigh, NC

- 9:55 AM 84 **IPM-Biotechnology: Biotechnology Meets Biopesticides in the Management of Pests and Pathogens. *Wayne Hunter***
(wayne.hunter@ars.usda.gov)¹ and Eduardo Andrade^{1,2}, ¹USDA - ARS, Ft. Pierce, FL, ²EMBRAPA, Brazil
- 10:15 AM 85 **New Molecular and Physiological Targets for Mosquitocide Development. *Peter Piermarini*** (piermarini.1@osu.edu), The Ohio State Univ., Wooster, OH
- 10:35 AM** **Break**
- 10:50 AM 86 **RNAi as a Pest Management Tool for the Western Corn Rootworm. *Ana Vélez***
(avelezarango2@unl.edu)¹, Elane Fishilevich², Nicholas Storer², Kenneth Narva² and Blair Siegfried³, ¹Univ. of Nebraska, Lincoln, NE, ²Dow AgroSciences, Indianapolis, IN, ³Univ. of Florida, Gainesville, FL.
- 11:10 AM 87 **Microscopic Studies of WCR: The Effects of Cry Proteins on the Anterior Midgut and bDNA ISH to Characterize the Spread of RNAi. *Andy Bowling***
(AJBowling@dow.com)¹, Heather Pence¹, Huarong Li¹, Alaina Turchi², Ted Letherer¹, Sek Yee Tan¹, Murugesan Rangasamy¹ and Kenneth Narva¹, ¹Dow AgroSciences, Indianapolis, IN, ²Indiana Univ., Bloomington, IN
- 11:30 AM 88 **New Technologies for Corn Rootworm Control. *Amit Sethi***
(amit.sethi@pioneer.com), DuPont Pioneer, Johnston, IA

STUDENT AFFAIRS SYMPOSIUM

FROM BASIC TO APPLIED SCIENCE: TRI-TROPHIC INTERACTIONS IN NATURAL AND MANAGED SYSTEMS

8:25 AM – 11:55 AM

STATE ROOM

ORGANIZED BY:

NCB-ESA STUDENT AFFAIRS COMMITTEE

MODERATED BY:

KAYLA PERRY, THE OHIO STATE UNIVERSITY

RACHEL SITZ, COLORADO STATE UNIVERSITY

- 8:25 AM Introductory Remarks
- 8:30 AM 89 **Extrafloral Nectaries: Effects of an Indirect Plant Defense on Natural Enemies. *Julie Peterson*** (*julie.peterson@unl.edu*), Univ. of Nebraska-Lincoln, North Platte, NE
- 8:50 AM 90 **Plant Domestication has Consequences for Direct and Indirect Plant Defense in the Solanaceae. *Michael Garvey*** (*garvey@purdue.edu*)¹, Curtis Creighton² and Ian Kaplan¹, ¹Purdue Univ., West Lafayette, IN, ²Purdue Univ., Hammond, IN
- 9:05 AM 91 **Molecular Identification of Arthropod Predators of Cucumber Beetles. *Molly Dieterich Mabin*** (*dieterich.9@osu.edu*)¹, Celeste Welty¹ and Mary Gardiner², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH
- 9:20 AM** **Break**
- 9:40 AM 92 **Some Lessons Learned: Pests and Predators in an Organic Cucurbit System. *Jamin Dreyer*** (*jamin.dreyer@gmail.com*), Kacie J. Athey, James Harwood and Mark A. Williams, Univ. of Kentucky, Lexington, KY

- 9:55 AM 93 **Evaluating Classical Biological Control Benefits and Non-target Risk: From Models to the Field.** *Joe Kaser* (*kaser008@umn.edu*) and George Heimpel, Univ. of Minnesota, St. Paul, MN
- 10:10 AM 94 **Reciprocal Interactions Between Plants and Parasitoids** *Paul Ode* (*paul.ode@colostate.edu*), Colorado State Univ., Fort Collins, CO
- 10:30 AM** **Break**
- 10:50 AM 95 **Linking the Green and Brown Worlds Through Nonconsumptive Predator Effects.** *Michael Sitvarin* (*michaelsitvarin@uky.edu*)¹, Ann Rypstra² and James Harwood¹, ¹Univ. of Kentucky, Lexington, KY, ²Miami Univ., Oxford, OH
- 11:05 AM 96 **Influence of Cattle Grazing Practices on Dung Beetle Communities.** *Patrick Wagner* (*pwwagner@huskers.unl.edu*)¹, Jeffrey Bradshaw² and Martha Mamo¹, ¹Univ. of Nebraska, Lincoln, NE, ²Univ. of Nebraska-Lincoln, Scottsbluff, NE
- 11:20 AM 97 **A Flood of Stinky Pests: Trophic Connections During Kudzu Bug Invasion.** *Kacie J. Athey* (*kacie.johansen@uky.edu*)¹, John Ruberson² and James Harwood¹, ¹Univ. of Kentucky, Lexington, KY, ²Kansas State Univ., Manhattan, KS
- 11:35 AM 98 **Assessing Risk of Over-summering Hosts for Wheat-mite-virus Complex in Winter Wheat.** *Anthony J. McMechan* (*justin.mcmechan@gmail.com*), Everlyne Wosula and Gary Hein, Univ. of Nebraska-Lincoln, Lincoln, NE
- 11:50 AM Concluding Remarks

TUESDAY AFTERNOON

SYMPOSIUM

POLLINATOR LANDSCAPE ECOLOGY

1:30 PM – 5:25 PM

STATE ROOM

ORGANIZED AND MODERATED BY:

DOUGLAS SPONSLER, THE OHIO STATE UNIVERSITY

REED JOHNSON, THE OHIO STATE UNIVERSITY

- 1:30 PM Introductory Remarks
- 1:35 PM 99 **Do honey Bees Need Their Five-a-day? Landscape and Dietary Diversity for Pollinators. *May Berenbaum***
(maybe@illinois.edu), Univ. of Illinois, Champaign, IL
- 1:55 PM 100 **Using Pollinator Networks to Compare Urban Land Management Strategies. *MaLisa Spring***
(malisa.spring@gmail.com) and Mary Gardiner, The Ohio State Univ., Wooster, OH
- 2:15 PM 101 **Quantifying the Pollinator Efficiency of Native Solitary Bees Across a Fragmented Prairie Landscape. *Jennifer Ison*** *(jison@wooster.edu)*, The College of Wooster, Wooster, OH
- 2:35 PM 102 **Prioritizing Spatial Investment in Pollinator Conservation Practices in Farmland to Support Crop Pollination and Honey Bee Health. *Angie Zhang*** *(zhangyaj@msu.edu)*, Rufus Isaacs, Jason Gibbs, Meghan Milbrath and Douglas A. Landis, Michigan State Univ., east Lansing, MI
- 2:55 PM** **Break**

- 3:10 PM 103 **Local Landscape Influences Bumble Bee Foraging and Nest Success on Reclaimed Ohio Coal Mines. *Jessie Wallace***
(wallace.677@osu.edu)¹ and Karen Goodell²,
¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Newark, OH
- 3:30 PM 104 **Herbicide drift impact on floral resources and pollination services: A landscape approach. *Melanie Kammerer*¹,(kma218@psu.edu)**
David Mortensen¹, J. Franklin Egan², Felix Bianchi³, Wopke van der Werf³, John Tooker⁴;
¹The Pennsylvania State University, Department of Plant Science, University Park, PA 16802; ² Pennsylvania Association for Sustainable Agriculture, Millheim, PA 16854, ³ Wageningen University, Farming Systems Ecology Unit, Wageningen, Netherlands, ⁴ The Pennsylvania State University, Department of Entomology, University Park, PA 16802
- 3:50 PM 105 **Monarch and Honey Bee Habitat Development and Research in Northeast Ohio. *Amber Barnes* (ab@pollinator.org),**
Pollinator Partnership, San Francisco, CA
- 4:10 PM** **Break**
- 4:25 PM 106 **Landscape Toxicology of Corn Seed Treatment Dust Exposure in Honey Bees. *Reed Johnson* (johnson.5005@osu.edu)¹,**
Chia-Hua Lin¹, Rodney Richardson², Douglas Sponsler¹, Michael Wransky³ and Harold Watters⁴, ¹The Ohio State Univ., Wooster, OH, ²The Ohio State Univ., Columbus, OH, ³Udacity Inc., Mountain View, CA, ⁴The Ohio State Univ., Bellefontaine, OH
- 4:45 PM 107 **Soybeans as a Potential Nectar Source for Honey Bees in Ohio's Agricultural Landscape. *Chia-Hua Lin* (Lin.724@osu.edu)¹,**
Paityn Monagan² and Reed Johnson¹, ¹The Ohio State Univ., Wooster, OH, ²Metro Early College High School, Columbus, OH

- 5:05 PM 108 **Spatial and Taxonomic Patterns of Honey Bee Foraging In and Around a Midwestern Metropolis. *Douglas Sponsler***
(*sponsler.18@osu.edu*)¹, Chia-Hua Lin¹,
Rodney Richardson², Emma Matcham² and
Reed Johnson¹, ¹The Ohio State Univ.,
Wooster, OH, ²The Ohio State Univ.,
Columbus, OH

SYMPOSIUM

INVASION BIOLOGY AND BIOLOGICAL CONTROL: TWO GREAT FIELDS THAT GO GREAT TOGETHER

1:30 PM – 5:30 PM

STILLMAN ROOM

ORGANIZERS AND MODERATORS:

MARK ASPLEN, METROPOLITAN STATE UNIVERSITY

JOE KASER, UNIVERSITY OF MINNESOTA

- 1:30 PM Welcoming Remarks
- 1:35 PM 109 **Invasion Biology of the Soybean Aphid. *Kaitlin Stack Whitney*** (*whitney3@wisc.edu*),
Univ. of Wisconsin-Madison, Madison, WI
- 1:55 PM 110 **Biological Control Agent Ecology: Lessons From Introduced Soybean Aphid Parasitoids. *Joe Kaser*** (*kaser008@umn.edu*), Jonathan Dregni, Nick Padowski, Robert Koch and George Heimpel, Univ. of Minnesota, St. Paul, MN
- 2:15 PM 111 **Ecology and Impact of the Emerald Ash Borer Invasion of North America. *Daniel Herms*** (*herms.2@osu.edu*), The Ohio State Univ., Wooster, OH
- 2:35 PM 112 **Factors Affecting the Establishment of Emerald Ash Borer (*Agrilus planipennis*) Parasitoids. *Juli Gould***
(*Juli.R.Gould@aphis.usda.gov*), USDA - APHIS, Buzzards Bay, MA

2:55 PM**Break**

- 3:10 PM 113 **Invasion Biology of the Brown Marmorated Stink Bug: A Behavioral and Ecological Perspective. *Anne Nielsen***
(*nielsen@aesop.rutgers.edu*), Rutgers, The State Univ. of New Jersey, Bridgeton, NJ
- 3:30 PM 114 **Biological Control of the Brown Marmorated Stink Bug (*Halyomorpha halys*): A Multifaceted Challenge. Christine Dieckhoff¹, Sean Boyle¹ and *Kim Hoelmer***
(*kim.hoelmer@ars.usda.gov*)², ¹Univ. of Delaware, Dept. of Entomology and Wildlife Ecology, Newark, DE, Newark, DE, ²USDA - ARS, Newark, DE
- 3:50 PM 115 **Invasion Biology of Spotted-wing *Drosophila* (*Drosophila suzukii*) From the Global and Regional Perspectives. *Mark Asplen***
(*mark.asplen@metrostate.edu*), Metropolitan State Univ., Saint Paul, MN

4:10 PM**Break**

- 4:25 PM 116 **Biological Control of Spotted Wing *Drosophila* - Is There Potential? *Kent M. Daane***
(*kdaane@ucanr.edu*)¹, Xin-geng Wang¹, Antonio Biondi², Betsey Miller³, Jeffrey C. Miller³, Peter Shearer⁴, Kim Hoelmer⁵ and Vaughn Walton³, ¹Univ. of California, Berkeley, Parlier, CA, ²Univ. of California, Berkeley, CA, ³Oregon State Univ., Corvallis, OR, ⁴Oregon State Univ., Hood River, OR, ⁵USDA - ARS, Newark, DE
- 4:45 PM 117 **Invasion of *Melanaphis sacchari* on the High Plains: Do We Have Enough Natural Enemies? *J.P. Michaud*** (*jpmi@ksu.edu*)¹ and Felipe Colares², ¹Kansas State Univ., Hays, KS, ²Universidade Federal Rural de Pernambuco, Dois Irmãos, Recife, Brazil

- 5:05 PM 118 **Natural Enemy Activity in Sorghum Hybrids Varying in Susceptibility to Sugarcane Aphid: Opportunities for Integrated Management of Sugarcane Aphid on Sorghum.** *Michael Brewer*¹ (mjbrewer@ag.tamu.edu), J.P. Michaud² and Erin Maxson³, ¹Texas A&M Agrilife Research, Corpus Christi, TX, ²Kansas State Univ., Hays, KS, ³Texas A&M Univ., College Station, TX
- 5:25 PM Concluding Remarks

SYMPOSIUM

EARLY-CAREER INVESTIGATORS IN INSECT PHYSIOLOGY, BIOCHEMISTRY, TOXICOLOGY, AND MOLECULAR BIOLOGY

1:35 PM – 4:10 PM

ALLEN ROOM

ORGANIZER AND MODERATOR:

PETER PIERMARINI, THE OHIO STATE UNIVERSITY

- 1:35 PM 119 **Aphid-Microbiome Dynamics Under Stress.** *Laramy Enders* (lenders2@unl.edu)¹, C. Michael Smith¹ and Nicholas Miller², ¹Dept. of Entomology, Kansas State Univ., Manhattan, KS, ²Univ. of Illinois, Chicago, IL
- 1:55 PM 120 **Transcriptome Evolution of Malaria Mosquito Testes: Function, Evolution, and Linkage.** *Bryan Cassone* (cassoneb@brandonu.ca), Brandon Univ., Brandon, MB, Canada
- 2:15 PM 121 **The Making of a Pest: Insights From Chemosensation in *Drosophila suzukii*.** *Paul Hickner* (phickner@nd.edu), Univ. of Notre Dame, Notre Dame, IN

- 2:35 PM 122 **Do Epigenetic Mechanisms Regulate Insect Diapause? *Julie Reynolds***
(*reynolds.473@osu.edu*) and David L. Denlinger, The Ohio State Univ., Columbus, OH
- 2:55 PM** **Break**
- 3:10 PM 123 **Molecular Analysis of Insecticide Resistance in the Red Flour Beetle, *Tribolium castaneum*. *Megha Kalsi*** (*meghakalsi@uky.edu*), Univ. of Kentucky, Lexington, KY
- 3:30 PM 124 **Tracing Organic Ion Transport in *Aedes aegypti* Using Common Dyes. *Matthew Rouhier*** (*rouhierm@kenyon.edu*), Kenyon College, Gambier, OH
- 3:50 PM 125 **Making Sexy Flies With Transgenics: Strategies to Improve Sterile Insect Technique. *Nicholas M. Teets*** (*n.teets@uky.edu*), Univ. of Kentucky, Lexington, KY

TUESDAY NOTES

WEDNESDAY JUNE 8, 2016: AT A GLANCE

Services	
7:30 AM – 10:00 AM	Registration, 3 rd Floor Lobby
Scientific Program	
8:00 AM – 10:00 AM	Posters Display – All posters (student and regular submission) on display until 10:00 AM Wednesday Prefunction Space
10:00AM – 12:00PM	Posters Takedown Prefunction Space
8:30 AM – 12:00 PM	Symposium: Agroecology in Specialty Crops: IPM Strategies to Address Pest Management Challenges; Stillman Room
8:40 AM – 10:35 AM	Submitted Ten-Minute Papers - Session I, Field Crop Entomology; State Room
9:40 AM – 11:55 AM	Submitted Ten-Minute Papers - Session II, Ecological and Evolutionary Entomology; Allen Room
Functions	
8:00 AM – 9:00 AM	Final Business Meeting Allen Room
Meetings	
11:30 AM – 1:00 PM	NCB Executive Committee final meeting, Hanna Room
8:00 AM – 5:00 PM	NC507: Monarch Butterfly Conservation, Palace Ballroom East

JUNE 8, 2016
WEDNESDAY MORNING

SYMPOSIUM

**AGROECOLOGY IN SPECIALTY CROPS: IPM
STRATEGIES TO ADDRESS PEST MANAGEMENT
CHALLENGES**

8:30 PM – 12:00 PM

STILLMAN ROOM

ORGANIZERS AND MODERATORS:

MOLLY DIETERICH MABIN, THE OHIO STATE UNIVERSITY
KACIE J. ATHEY, UNIVERSITY OF KENTUCKY
JAMIN DREYER, UNIVERSITY OF KENTUCKY

- 8:30 AM 126 **Using Cultural and Physical Control Techniques for Spotted Wing *Drosophila* Management in Raspberries.** *Heather Leach* (*leachhea@msu.edu*), Eric Hanson, Josh Moses, Steven Van Timmeren and Rufus Isaacs, Michigan State Univ., East Lansing, MI
- 8:50 AM 127 **Assessing Attraction and Selectivity Performance of Monitoring Tools for *Drosophila suzukii*.** *Alix Whitener* (*alix.crilly@wsu.edu*)¹, Boyd Mori² and Elizabeth H. Beers¹, ¹Washington State Univ., Wenatchee, WA, ²Swedish Univ. of Agricultural Sciences, Alnarp, Sweden
- 9:10 AM 128 **Habitat Management for Natural Enemies and Pollinators: The Effect of Within-Field Floral Strips on Beneficial Insects.** *Nicole Quinn* (*quinni01@vt.edu*)¹, Daniel Brainard² and Zsofia Szendrei², ¹Virginia Polytechnic Institute and State Univ., Blacksburg, VA, ²Michigan State Univ., East Lansing, MI

9:30 AM**Break**

- 9:45 AM 129 **Let's Explode Some Beetles! Investigating the Use of Biological Control in Cucurbit Pest Management. *Amanda Skidmore* (amanda.skidmore@gmail.com) and Ric Bessin, Univ. of Kentucky, Lexington, KY**
- 10:05 AM 130 **The Role of Tillage and Burial in Grape Berry Moth Management. *Jason Matlock* (matlockj@msu.edu), Matt Grieshop and Rufus Isaacs, Michigan State Univ., East Lansing, MI,**
- 10:25 AM 131 **Pest Management Strategies for Asparagus. *Amanda Buchanan* (alynn@msu.edu)¹, Jason Schmidt², Adam Ingrao¹, Matt Grieshop¹ and Zsolia Szendrei¹, ¹Michigan State Univ., East Lansing, MI, ²Univ. of Georgia, Tifton, GA**

10:45AM**Break**

- 11:00 AM 132 **Love Stinks: Identifying the Celery Leaf-tier (*Udea rubigalis*) Pheromone for the Integrated Pest Management of Celery. *Jessica Kansman* (jtkp8b@missouri.edu)¹ and Zsolia Szendrei², ¹Univ. of Missouri, Columbia, MO, ²Michigan State Univ., East Lansing, MI**
- 11:20 AM 133 **Pest Management in High Tunnels: Evaluating Biological Control and Screening. *Laura Ingwell* (laura.ingwell@gmail.com), Rick Foster and Ian Kaplan, Purdue Univ., West Lafayette, IN**
- 11:40 AM 134 **Molecular Gut Content Analysis Reveals the Diet of a Ubiquitous Insect Predator, Dolichopodidae, in Two Different Habitats. *Andrea Kautz* (kautz.14@osu.edu)¹, Rodney Richardson¹, Nicole Hoekstra² and Mary Gardiner², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH**

SUBMITTED TEN-MINUTE PAPERS - SESSION I, FIELD CROP ENTOMOLOGY

8:40 PM – 10:35 PM

STATE ROOM

MODERATORS:

**ERIN HODSGON, IOWA STATE UNIVERSITY
KENNETH MASLOSKI, IOWA STATE UNIVERSITY**

- 8:40 AM 135 **Inheritance and Fitness Cost Associated with Field-Evolved Cry3Bb1 Resistance by Western Corn Rootworm. *Ram B. Shrestha* (shrestrb@iastate.edu) and Aaron J. Gassmann, Iowa State Univ., Ames, IA**
- 8:52 AM 136 **Testing Western Corn Rootworm (Coleoptera: Chrysomelidae) for Cross-Resistance Between Cry Toxins and Soil Insecticides. *Kenneth E. Masloski* (masloski@iastate.edu), Joel R. Coats and Aaron J. Gassmann, Iowa State Univ., Ames, IA**
- 9:04 AM 137 **Novel Biopesticides Show Potential for Control of Western Corn Rootworm Larvae (*Diabotica virgifera virgifera*) as In-Furrow and Seed Treatments. Nicholas Vandervort¹, *Timothy Johnson* (tjohnson@marronebio.com)², Pankaj Pathak³ and Pamela Marrone³, ¹Marrone Bio Innovations, Inc., Cresco, IA, ²Marrone Bio Innovations, Inc., Danville, PA, ³Marrone Bio Innovations, Inc., Davis, CA**

- 9:16 AM 138 **Evaluation of Gene Flow in Structured and Seed Blend Refuge Planting Systems. *Isaac Oyediran* (isaac.oyediran@syngenta.com)¹**, Galen Dively², Fangneng Huang³, Tony Burd¹ and Shannon Morsello⁴, ¹Syngenta Crop Protection, Research Triangle Park, NC, ²Univ. of Maryland, College Park, MD, ³Louisiana State Univ. Agricultural Center, Baton Rouge, LA, ⁴Syngenta Crop Protection, Research Triangle Park, NC
- 9:28 AM** **Break**
- 9:45 AM 139 **Dow AgroSciences Corn Insect Resistance Traits Technology Update. *Bradley Hopkins* (bwhopkins@dow.com)¹**, Dwain Rule¹ and Laura Campbell², ¹Dow AgroSciences, Indianapolis, IN, ²Dow AgroSciences, Carbondale, IL
- 9:57 AM 140 **Fitting Best Management Practices for *Bt* Crops in the Tropics: Challenges and Opportunities for Unified Solutions. *Boris Castro* (bacastro@dow.com)¹**, Ana Correa², Nicholas Storer¹ and José Waquil³, ¹Dow AgroSciences, Indianapolis, IN, ²Dow AgroSciences, Ribeirão Preto, Brazil, ³IPM Consultant, Sete Lagoas, MG, Brazil
- 10:09 AM 141 **Using Host Plant Resistance for Soybean Aphid and Soybean Cyst Nematode to Protect Soybean Yield. *Erin W. Hodgson* (ewh@iastate.edu)**, Greg VanNostrand and Eric H. Clifton, Iowa State Univ., Ames, IA
- 10:21 AM 142 **Management of Soybean Aphid with Transform[®] WG Insecticide. *Sunil Tewari* (stewari@dow.com)¹**, Dave Ruen², Patricia Prasifka³ and Melissa Willrich Siebert⁴, ¹Dow AgroSciences, Fowler, IN, ²Dow AgroSciences, Lanesboro, MN, ³Dow AgroSciences, West Fargo, ND, ⁴Dow AgroSciences, Greenville, MS

**SUBMITTED TEN-MINUTE PAPERS - SESSION II,
ECOLOGICAL AND EVOLUTIONARY ENTOMOLOGY**

9:40 PM – 11:48 AM

ALLEN ROOM

MODERATOR: WENDY KLOOSTER, THE OHIO STATE UNIVERSITY

- 9:40 AM 143 **Modelling Monarch Butterfly (*Danaus plexippus*) Movement and Egg-Laying in a Spatially-Explicit Iowa Landscape. Tyler Grant** (tgrant@iastate.edu)¹, Steven P. Bradbury¹, Hazel R. Parry² and Myron Zalucki³, ¹Iowa State Univ., Ames, IA, ²CSIRO, Brisbane, Australia, ³Univ. of Queensland, Brisbane, Australia
- 9:52 AM 146 **Influence of Food Supplementation During Overwintering on the Survival and Fitness of *Hippodamia convergens* adults. Nathan Mercer** (nhmercer13@gmail.com), John Obrycki and Ric Bessin, Univ. of Kentucky, Lexington, KY
- 10:04 AM 147 **Forest Responses to Ash Tree Mortality Following Emerald Ash Borer (*Agrilus planipennis*) Infestation. Wendy Klooster** (klooster.2@osu.edu)¹, P. Charles Goebel² and Daniel Herms², ¹The Ohio State Univ., Columbus, OH, ²The Ohio State Univ., Wooster, OH
- 10:16 AM 148 **Effects of Cultivated and Wild Plants on Foraging Decisions in a Crucifer Pest System. Ryan Paul** (rlpaul@rams.colostate.edu), Paul Ode and Dhaval Vyas, Colorado State Univ., Fort Collins, CO
- 10:28 AM 149 **Effects of a Toxic Defensive Phenotype Ripple Through a Predator Community. Paul A. Lenhart** (palenhardt@uky.edu) and Jennifer A. White, Univ. of Kentucky, Lexington, KY

10:40 AM**Break**

- 11:00 AM 150 **Chemically Mediated Host Colonization Behavior of the Peach Bark Beetle, *Phloeotribus liminaris* (Coleoptera: Curculionidae: Scolytinae).** ***Gabriel Hughes*** (*ghughes@purdue.edu*) and Matthew Ginzel, Purdue Univ., West Lafayette, IN
- 11:12 AM 151 **Investigating Defensive Tarsal Morphology Adaptations of the Small Hive Beetle, *Aethina tumida* (Murray, Nitidulidae: Coleoptera).** ***William Montag*** (*montag2@illinois.edu*), Univ. of Illinois Urbana-Champaign, Champaign, IL
- 11:24 AM 152 **Influence of Hypoxia on Cowpea Weevil Egg-Laying Behavior and Progeny Development.** ***Kabita Kharel*** (*kkharel@purdue.edu*), Dieudonne Baributsa, Scott Williams and Linda J. Mason, Purdue Univ., West Lafayette, IN

WEDNESDAY NOTES

AUTHOR INDEX

(BY PRESENTATION NUMBER)

Adams, Clare I	6
Adams, Rachelle	9, D17, D27
Adesemoye, Anthony	D1
Akhunov, Eduard	D9
Albro, Sandra	40
Ali, Md. Emran	82
Allan, Brian F.	22
Allmann, Erin	22
Andrade, Eduardo	84
Anelli, Carol	63
Archibald, Westen	45
Asplen, Mark	115
Athey, Kacie J.	92, 97
Baena-Bejarano, Nathalie	D8
Baer, Christina	74
Baldin, Edson	17
Bansal, Raman	8, 18, 19, 26, 81
Baributsa, Dieudonne	49, 152
Barriball, Kelly	83
Bautista Jimenez, Robin	D29
Beauzay, Patrick	5
Beers, Elizabeth H.	127
Benkert III, Edwin	14
Berenbaum, May	64, 99
Bessin, Ric	129, 146
Bhusal, Siddhi	18
Bianchi, Felix	104
Bidne, Keith	D26
Biondi, Antonio	116

Blood, Bridget	52
Bonello, Pierluigi	79
Bonning, Bryony	80
Booher, Doug	30
Bosque-Perez, Nilsa	69
Bowling, Andy	87
Boyle, Sean	114
Bradbury, Steven P.	143, D7, D26
Bradford, Benjamin	43
Bradshaw, Jeffrey	35, 96
Brainard, Daniel	128
Brenner, Robert	44
Brewer, Michael	118
Buchanan, Amanda	131
Burd, Tony	138
Burkman, Caitlin	D12
Calkins, Travis	24
Campbell, James	D9
Campbell, Laura	139
Cardenas, Cody R.	D17
Cassone, Brian	8, 70, 71, 120
Castro, Boris	140
Chapman, Kaitlin	20
Chougule, Nanasaheb	80
Cipollini, Don	31, 56, 79
Cisneros Carter, Fiorella	71
Clements, Justin	D3
Clifton, Eric H.	141
Cline, Andrew R.	D11
Coates, Brad S.	8, D7
Coats, Joel R.	136, D26
Cohen, Dr. Jeffrey	D32

Cohnstaedt, Lee	16
Colares, Felipe	117
Cordeiro, Erick	D9
Correa, Ana	140
Cranshaw, Whitney	54, D33
Creighton, Curtis	90
Culkin, Christopher	68
D'Amico, Vincent	75
Daane, Kent M.	116
Dale, Andrew	27
Darner, Rob	40
Dehnel, Allison	36
Deist, Benjamin	80
Delgado de la Flor, Yvan	D12
DeMillo, Alexandria M.	D17, D27
Denlinger, David L.	122, D28, D29
Dieckhoff, Christine	114
Dieterich Mabin, Molly	91, D20
Dillard, Jacqueline	29
Dolezal, Adam	6
Dorrance, Anne	82
Dregni, Jonathan	110
Dreyer, Jamin	92
Drijfhout, Falko	D27
Duffy, Alexandra	51
Dunbar, Mike W.	D34
Dunkel, Florence	58
Dunn, Emily	75
Egan, J Franklin	104
Eichholz, Mary	D13
Enders, Laramy	119
Fernandez-Luna, Maria	80

Finer, John	82
Fisher, Kelsey E.	D7
Fisher, Susan	65
Fishilevich, Elane	86
Flores-Escobar, Biviana	80
Foster, Rick	133
Galea, Mary	105
Galen, Dively	138
Gardiner, Mary	32, 34, 38, 40, 91, 100, 134, D2, D12, D20, D23, D35
Gardner, Allison	22
Garmestani, Ahjond	40
Garrick, Ryan	11
Garvey, Michael	90
Gassmann, Aaron J.	135, 136
Gedling, Cassidy	70
Geitgey, Natalie	83
Genco, Madeline	D24
Gibbs, Jason	102
Gibson, Dan	37
Gibson, Josh	30
Ginzel, Matthew	39, 51, 52, 150, D15
Goebel, P. Charles	28, 147, D5
Goodell, Karen	103, D6
Gordon, Chelsea A.	D2
Gordon, David	60
Goulart Montezano, Debora	17
Gould, Juli	112
Grant, Tyler	143
Graziano, Michael	D5
Grieshop, Matt	41, 130, 131
Groves, Russell	33, 43, D3, D14
Gunter, Nicole	145

Hadziabdic, Denita	52
Hagstrum, David	21
Han, Jinlong	4
Hanks, Lawrence M.	42, 53, 57, 75
Hansen, Allison	13, 81
Hansen, T. E.	81
Hansen, Thorsten	50
Hanson, Anthony	18
Hanson, Elizabeth	57
Hanson, Eric	126
Hartman, Glen L.	2
Harwood, James	27, 92, 95, 97
Hazel, Alexander	42
Heads, Sam W.	D8
Hedlund, Tyler	22
Heidel-Baker, Thelma	5
Heimpel, George	93, 110
Hein, Gary	72, 98, D21
Heng-Moss, Tiffany	20
Herms, Daniel	34, 55, 78, 79, 111, 147, D10
Hesler, Louis	18
Hickner, Paul	121
Hodgson, Erin W.	141
Hoekstra, Nicole	134, D2, D23
Hoelmer, Kim	114, 116
Hopkins, Bradley	139
Horn, Dave	153
Hough-Goldstein, Judith A.	75
Huang, Fangneng	138
Hughes, Gabriel	51, 150
Hunt, Thomas	17, D4, D31
Hunter, Wayne	66, 84

Ingrao, Adam	131
Ingwell, Laura	69, 133
Isaacs, Rufus	102, 126, 130
Ison, Jennifer	101
Jackson, Kelly	36
Jahnes, Benjamin	10
Jasinski, James	D32
Jiang, Guo-Liang	18
Joern, Anthony	144
Johnson, Reed	106, 107, 108, D6, D16, D18
Johnson, Timothy	137
Johnson, Todd	57
Johnston, J. Spencer	8
Josek, Tanya	22
Juzwik, Jennifer	39
Kalsi, Megha	123
Kammerer, Melanie	104
Kansman, Jessica	132
Kaplan, Ian	69, 90, 133
Kaser, Joe	93, 110
Kautz, Andrea	134, D2, D24
Keough, Stacy	4
Kharel, Kabita	152
Kim, Dohyup	25
Kleinjan, Jonathan	D34
Kleinke, Brian M.	D2
Klingeman, William	52
Klooster, Wendy	147
Knodel, JJ.	5
Knoell, Elliot	D21
Koch, Robert	18, 46, 110, D22
Kranz, Adam	D25

Krishnan, Niranjana	D26
Krumm, Jeffrey	D4, D31
Krupke, Christian	5
Kulhanek, Ashley L.	D32
Ladin, Zachary	75
Lagos-Kutz, Doris	2, 4
LaMantia, Jonathan	83
Lan, Que	D3
Landis, Douglas A.	37, 102
Leach, Heather	126
Leaf, Trisha	15
Legeai, Fabrice	8
Lenhart, Paul A.	149
Letherer, Ted	87
Li, Huarong	87
Li-Byarlay, Hongmei	81
Lin, Chia-Hua	106, 107, 108, D6, D18
Long, Elizabeth	67
Lorenz, Aaron	18
Louis, Joe	20
Louw, Marti	D24
Luna, Emily	D33
Lustofin, Katy	59
Mamo, Martha	35, 96
Marquis, Robert	74
Marrone, Pamela	137
Masloski, Kenneth E.	136
Mason, Charles	76
Mason, Linda J.	152
Matcham, Emma	108, D16, D18
Mathew, Febina	D34
Matlock, Jason	130

Matthews, Stephen	D5
Maxson, Erin	118
McCornack, Brian	16
McDermott, Margaret	39
McFarland, Mike	D19
McKenna, Duane D.	77
McMechan, Anthony J.	72, 98
McShaffrey, Dave	61
Meier, Linnea R.	53
Meinke, Lance	23, D1
Mercer, Nathan	146
Mian, Rouf	82, 83
Michaud, J.P.	117, 118
Michel, Andrew	19, 26, D28
Michel, Andy	8, 18, 82
Milbrath, Meghan	102
Millar, Jocelyn G.	53, 75
Miller, Betsey	116
Miller, Jeffrey C.	116
Miller, Nicholas	119
Mitchell, Robert	77
Mittapelly, Priyanka	26
Mollet, Kayla A.	D1
Monagan, Paityn	107
Mongold-Diers, Judy A.	53
Montag, William	151
Mori, Boyd	127
Morse, John	D24
Morsello, Shannon	138
Mortensen, David	104
Moses, Josh	126
Murdock, Larry	49

Murrell, Ebony	5
Nacci, Chris	83
Nachappa, Punya	4, 68
Nalam, Vamsi	68
Narva, Kenneth	86, 87
Nash, David	D27
Nault, Lowell	62
Neupert, Stefanie	D27
Nielsen, Anne	113
Nováková, E	81
O'Brien, Erin M.	55
O'Neal, Matt	6, 7, 47
Obrycki, John	146
Ode, Paul	94, 148
Oliveira Hofman, Camila	72, D1
Osman, Sema	10
Ostlie, Ken	14, 15
Oyediran, Isaac	138
Padowski, Nick	110
Parker, Allison	22
Parry, Hazel R.	143
Pathak, Pankaj	137
Paul, Ryan	148
Paula-Moraes, Silvana V.	17
Pavinato, Vitor	8, 19, D28
Peairs, Frank B.	D33
Pence, Heather	87
Penn, Hannah J.	27
Pereira, Adriano	23
Pereira, Renata	D4, D31
Perry, Kayla I	D10
Peterson, Brittany	D15

Peterson, Donnie	56
Peterson, Julie	17, 45, 89, D1
Peterson, Nathan	D3
Pezzini, Daniela	D22
Phillips, Thomas	D9
Piermarini, Peter	24, 85
Pillajo, Juan	D6
Polak, Michal	48
Poley, Kristin	41
Potter, Bruce D.	5
Powell, Gareth	D11
Prajzner, Scott	32, D2
Prasifka, Patricia	142
Price, Garrett	D15
Prince, Kathryn	33, D14
Prischmann-Voldseth, Deirdre	44
Pritchard, Shelby	47
Purandare, Swapna R.	3
Qiu, Fan	144
Qu, Feng	82
Quellhorst, Hannah	49
Quinn, Nicole	128
Raghavan, Rahul	12
Rangasamy, Murugesan	87
Redinbaugh, Margaret	71, 83
Regan, Karly	5
Reynolds, Julie	122, D29
Ribeiro, Matheus	D4, D31
Richardson, Rodney	106, 108, 134, D6
Richmond, Douglas	51, D15
Rigsby, Chad M.	79
Riley, Christopher B.	34

Riusech, Natalia	D6
Roberson, Elizabeth	31
Rose, Sarah	28, D5
Rotenberg, Dorith	73
Rouhier, Matthew	124
Ruberson, John	97
Ruen, Dave	142
Rule, Dwain	139
Rypstra, Ann	95
Sabree, Zakee	10
Saya, Peter	68
Scharf, Michael	D15
Schmid, Ryan	16
Schmidt, Jason	131
Schoville, Sean	D3
Schultz, Ted R.	D17
Schurr, Hailey	D30
Schwartz, Adam	77
Sethi, Amit	88
Shearer, Peter	116
Showalter, David	79
Shrestha, Ram B.	135
Shreve, Scott M.	D13
Shumaker, Kate	D32
Shuster, William	40
Siegfried, Blair	23, 86, D4, D31
Silva, José P. G. F.	17
Singh, Arti	47
Singh, Asheesh	47
Sinisterra, Xiomara	66
Sitvarin, Michael	95
Sitz, Rachael	54, D33

Sivakoff, Frances S.	D35
Skidmore, Amanda	129
Skidmore, I	81
Smith, C. Michael	119
Smith, Charlotte	70
Snyder, Darren	16
Spacht, Drew	D28
Speller, Simon	D27
Sponsler, Douglas	106, 108, D6, D16, D18
Spring, MaLisa	40, 100
Stewart, Lucy	71
Stewart, Tyler	39
Storer, Nicholas	86, 140
Suarez, Andrew	30
Subramanyam, Bhadriraju	21
Suresh, Sreelakshmi	D18
Suárez Victor, Vinícius	D1
Svenson, Gavin J.	145
Szczepaniec, Ada	5
Szendrei, Zsafia	128, 131, 132
Tan, Sek Yee	87
Taylor, Steven	D8
Tedrow, Riley	145
Teets, Nicholas M.	125
Tetreault, Hannah	144
Tewari, Sunil	142
Thairu, Margaret W.	81
Tilmon, Kelley	1, 3, 5
Tisserat, Ned	54
Titus, Lauren	48
Todd, Jane	71
Todd, Katherine	38

Tooker, J	104
Toth, Amy L.	6
Tran, Anh K.	46
Turchi, Alaina	87
Ungerer, Mark	144
van der Werf, Wopke	104
Van Timmeren, Steven	126
Vandervort, Nicholas	137
VanNostrand, Greg	141
Varenhorst, Adam	7, 47, D34
Villari, Caterina	79
Voegtlin, David	2, 4
Vossbrinck, Alice M.	D2
Vyas, Dhaval	148
Vélez, Ana	17, 86
Wagner, Patrick	35, 96
Wallace, Jessie	103
Wallin, Kimberly	D10
Walton, Vaughn	116
Wang, Xin-geng	116
Waquil, José	140
Watters, Harold	106
Welti, Ellen	144
Welty, Celeste	91, D20
Wenger, Jacob	8
Wenzel, John	D10, D24
White, Jennifer A.	36, 50, 149
Whitehill, Justin G. A.	79
Whitener, Alix	127
Whitfield, Anna	73
Whitney, Kaitlin Stack	109
Wibben, Sherry	74

Wickline, Samuel	81
Wijeratne, Saranga	71
Williams, Mark A.	92
Williams, Scott	49, 152
Willrich Siebert, Melissa	142
Wosula, Everlyne	72, 98
Wransky, Michael	106
Wright, Robert	45
Yao, Kouame	21
Yates, Ashley	8, 19, 82
Yu, Allen	57
Zalucki, Myron	143
Zaspel, Jennifer	D11
Zhang, Angie	102
Zhang, Ge	6
Zhu, Kun Yan	21
Zou, Yunfan	53

TAXONOMIC INDEX
(BY PRESENTATION NUMBER)

Acari Eriophyidae <i>Aceria tosichella</i>	72, 98, D21
Acari Ixodidae <i>Amblyomma americanum</i>	22
Acari Ixodidae <i>Amblyomma maculatum</i>	12
Acari Tetranychidae <i>Petrobia latens</i>	D33
Acari Tetranychidae <i>Tetranychus urticae</i>	44
Araneae Lycosidae	28
Coleoptera Bostrichidae <i>Rhyzopertha dominica</i>	21, D9
Coleoptera Buprestidae <i>Agrilus planipennis</i>	55, 56, 77, 78, 79, 111, 112, 147
Coleoptera Carabidae	D12
Coleoptera Cerambycidae	75
Coleoptera Cerambycidae <i>Anelaphus pumilus</i>	42
Coleoptera Cerambycidae <i>Anoplophora glabripennis</i>	76, 77
Coleoptera Cerambycidae <i>Euderces pini</i>	42
Coleoptera Cerambycidae <i>Megacyllene caryae</i>	42, 57
Coleoptera Chrysomelidae <i>Acalymma vittatum</i>	91, 129, D20
Coleoptera Chrysomelidae <i>Callosobruchus maculatus</i>	49, 152
Coleoptera Chrysomelidae <i>Cerotoma cerotoma trifurcata</i>	D31
Coleoptera Chrysomelidae <i>Cerotoma trifurcata</i>	70
Coleoptera Chrysomelidae <i>Diabrotica barberi</i>	14, 15
Coleoptera Chrysomelidae <i>Diabrotica undecimpunctata howardi</i>	23, D20
Coleoptera Chrysomelidae <i>Diabrotica virgifera virgifera</i>	14, 15, 86, 87, 88, 135, 136,

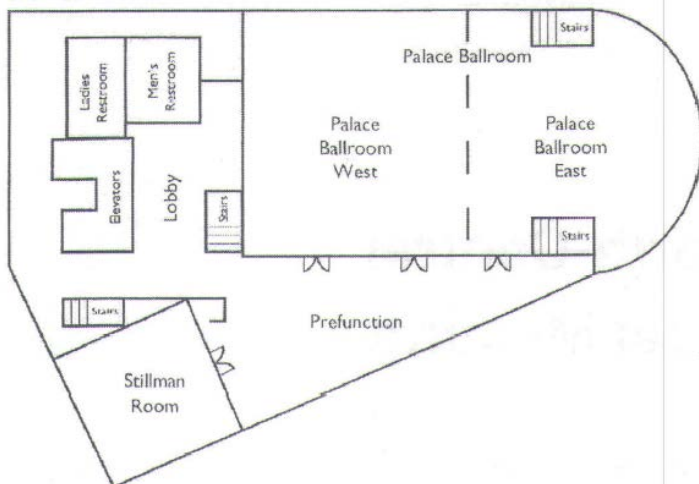
	137, 139, D1
Coleoptera Chrysomelidae <i>Leptinotarsa decemlineata</i>	D3
Coleoptera Coccinellidae <i>Coccinella septempunctata</i>	149
Coleoptera Coccinellidae <i>Coleomegilla maculata</i>	45
Coleoptera Coccinellidae <i>Harmonia axyridis</i>	36, 46, 149
Coleoptera Coccinellidae <i>Hippodamia convergens</i>	146
Coleoptera Curculionidae <i>Cyrtopistomus castaneus</i>	74
Coleoptera Curculionidae <i>Phloeotribus liminaris</i>	150
Coleoptera Curculionidae <i>Pityophthorus juglandis</i>	39, 52
Coleoptera Curculionidae <i>Sitophilus oryzae</i>	21
Coleoptera Curculionidae <i>Sitophilus zeamais</i>	21
Coleoptera Curculionidae <i>Sphenophorus parvulus</i>	51
Coleoptera Curculionidae <i>Sphenophorus venatus vestitus</i>	51
Coleoptera Curculionidae <i>Xylosandrus crassiusculus</i>	39
Coleoptera Nitidulidae <i>Aethina tumida</i>	151
Coleoptera Passalidae <i>Odontotaenius disjunctus</i>	29
Coleoptera Scarabaeidae	96
Coleoptera Scarabaeidae <i>Popillia japonica</i>	131, D15
Coleoptera Staphylinidae	D12
Coleoptera Tenebrionidae <i>Tribolium castaneum</i>	123
Diptera Agromyzidae <i>Ophiomyia simplex</i>	131
Diptera Cecidomyiidae <i>Mayetiola destructor</i>	16
Diptera Chironomidae <i>Belgica belgica antarctica</i>	D28

Diptera Culicidae <i>Aedes aegypti</i>	24, 85, 124
Diptera Culicidae <i>Anopheles gambiae</i>	120
Diptera Dolichopodidae <i>Condylostylus</i>	134
Diptera Drosophilidae <i>Drosophila nigrospiracula</i>	48
Diptera Drosophilidae <i>Drosophila suzukii</i>	115, 116, 121, 126, 127, D25
Diptera Sarcophagidae <i>Sarcophaga bullata</i>	D29
Diptera Tachinidae <i>Celatoria setosa</i>	129
Fagales Juglandaceae <i>Juglans nigra</i>	39
Hemiptera Anthocoridae <i>Orius insidiosus</i>	46
Hemiptera Aphididae	2, 81
Hemiptera Aphididae <i>Acyrtosiphon pisum</i>	25
Hemiptera Aphididae <i>Aphis craccivora</i>	36, 50, 149
Hemiptera Aphididae <i>Aphis glycines</i>	1, 2, 3, 4, 5, 6, 7, 8, 18, 19, 20, 46, 47, 68, 80, 81, 82, 93, 109, 110, 119, 141, 142, D4
Hemiptera Aphididae <i>Melanaphis sacchari</i>	117, 118
Hemiptera Aphididae <i>Rhopalosiphum padi</i>	67, 69
Hemiptera Cicadellidae <i>Empoasca fabae</i>	D25
Hemiptera Cicadellidae <i>Graminella nigrifrons</i>	71
Hemiptera Cicadellidae <i>Homalodisca vitripennis</i>	66
Hemiptera Kermesidae <i>Allokermes rattani</i>	54
Hemiptera Pentatomidae <i>Chinavia hilaris</i>	97
Hemiptera Pentatomidae <i>Euschistus servus</i>	97
Hemiptera Pentatomidae <i>Halyomorpha halys</i>	26, 41, 83, 113, 114, D22
Hemiptera Pentatomidae <i>Nezara viridula</i>	97
Hemiptera Psyllidae <i>Diaphorina citri</i>	84
Hemiptera Triozidae <i>Bactericera cockerelli</i>	68
Hymenoptera	33, D14

Hymenoptera Aphelinidae <i>Aphelinus certus</i>	93
Hymenoptera Apidae <i>Apis mellifera</i>	99, 102, 105, 106, 107, 108, D6, D16, D18, D35
Hymenoptera Apidae <i>Bombus impatiens</i>	32, 104
Hymenoptera Apidae <i>Bombus terrestris</i>	D35
Hymenoptera Braconidae <i>Centistes diabolica</i>	129
Hymenoptera Braconidae <i>Cotesia</i>	148
Hymenoptera Braconidae <i>Cotesia congregata</i>	90
Hymenoptera Formicidae <i>Megalomyrmex symmetochus</i>	D27
Hymenoptera Formicidae <i>Sericomyrmex amabilis</i>	D27
Hymenoptera Formicidae <i>Strumigenys strumigenys eggersi</i>	30
Hymenoptera Formicidae <i>Strumigenys strumigenys louisianae</i>	30
Hymenoptera Formicidae <i>Trachymyrmex balboai</i>	D17
Hymenoptera Formicidae <i>Trachymyrmex zeteki</i>	D17
Lepidoptera Crambidae <i>Udea rubigalis</i>	132
Lepidoptera Danaidae <i>Danaus plexippus</i>	105, 143, D7, D26
Lepidoptera Noctuidae <i>Helicoverpa zea</i>	17
Lepidoptera Noctuidae <i>Heliothis virescens</i>	140
Lepidoptera Noctuidae <i>Spodoptera frugiperda</i>	17, 140
Lepidoptera Noctuidae <i>Striacosta albicosta</i>	45
Lepidoptera Pieridae <i>Pieris rapae</i>	148
Lepidoptera Pyralidae <i>Plodia interpunctella</i>	49
Lepidoptera Sesiidae <i>Melittia cucurbitae</i>	D19
Lepidoptera Sphingidae <i>Manduca sexta</i>	90

Lepidoptera Tortricidae <i>Paralobesia viteana</i>	130
Mantodea Mantidae <i>Callimantis antillarum</i>	145
Mesostigmata Macrochelidae <i>Macrocheles subbadius</i>	48
Orthoptera Gryllidae <i>Acheta domesticus</i>	41
Orthoptera Ripipterygidae	D8
Orthoptera Tridactyloidea	D8
Psocoptera Ectopsocidae <i>Ectopsocopsis cryptomeriae</i>	D13
Thysanoptera Thripidae <i>Frankliniella occidentalis</i>	44, 73
Tylenchida Heteroderidae <i>Heterodera glycines</i>	141

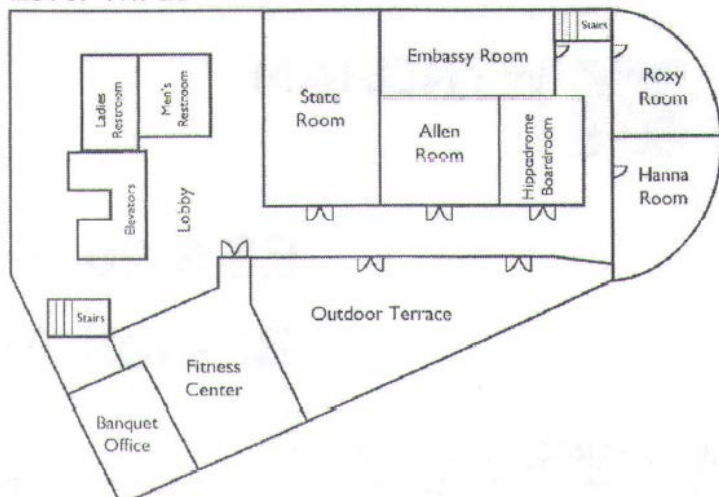
Level Two



MONSANTO



Level Three



Bayer CropScience

Mark Your Calendars!

Plan to Attend

ESA-NCB 2017

@

Indianapolis, IN!!!!

ICE 2016

Hear the Latest Science

See the Latest Innovations

Raise Your Profile with this Global Audience



Make new connections during this important global event.

The Congress will provide a dynamic forum for the exchange of the latest science, research and innovations among entomologists and others from around the world.

Research will cover every aspect of the discipline.

The largest gathering of scientists and experts in the history of the discipline.



Register Early to Save \$*
www.ice2016orlando.org/register
*Deadline August 31

THINGS TO DO:

- ✓ Register www.ice2016orlando.org/register
- ✓ Reserve a hotel room www.ice2016orlando.org/housing
- ✓ Register for optional tours www.ice2016orlando.org/tours

Nearly 300 symposia will cover 30 scientific sections

www.ice2016orlando.org/symposia

Close to 5,000 scientific presentations scheduled!

Interact with the world's leading experts in many fields to exchange ideas and build your research. Symposia will highlight the most recent advances in a wide diversity of entomological subjects around a global theme.

Students and early career scientists have a once-in-a-lifetime opportunity to present their research in front of a global audience, to compete in global competitions, and will make important lifetime connections!



XXV International Congress of Entomology
Orlando, Florida, USA
September 25-30



Sharing Insect Science Globally • www.entsoc.org

www.ice2016orlando.org

SEPTEMBER 25-30, 2016 • ORANGE COUNTY CONVENTION CENTER, ORLANDO, FLORIDA USA