

# North Central Branch

ENTOMOLOGICAL SOCIETY OF AMERICA



**Dr. Bill Ravlin, President**



# Table of Contents

<b>Notes</b>	<b>2</b>
<b>Sponsors</b>	<b>3</b>
<b>About NCB-ESA</b>	<b>3</b>
<b>Meeting Information</b>	<b>4</b>
Meeting Logistics . . . . .	4
2019 NCB-ESA Meeting Organizers . . . . .	9
Committee Information . . . . .	10
Special Acknowledgements . . . . .	12
<b>2019 Awards</b>	<b>13</b>
2019 NCB-ESA Award Winners . . . . .	13
Student Travel Scholarship Winners . . . . .	18
<b>Program Schedule</b>	<b>19</b>
<b>Oral &amp; Poster Presentation Schedule</b>	<b>22</b>
Sunday, March 17, 2019, Afternoon . . . . .	22
Monday, March 18, 2019, Posters . . . . .	23
Monday, March 18, 2019, Morning . . . . .	25
Monday, March 18, 2019, Afternoon . . . . .	29
Tuesday, March 19, 2019, Posters . . . . .	32
Tuesday, March 19, 2019, Morning . . . . .	34
Tuesday, March 19, 2019, Afternoon . . . . .	36
Wednesday, March 20, 2019, Morning . . . . .	39
<b>Author Index</b>	<b>41</b>
<b>Common Name Index</b>	<b>47</b>
<b>Scientific Name Index</b>	<b>48</b>
<b>Floor Plans</b>	<b>50</b>
<b>2020 Meeting Information</b>	<b>back</b>

[illegible]

# Sponsors

## Special Thanks to our Meeting Sponsors



Bayer CropScience

MONSANTO



Agriculture Division of DowDuPont™

syngenta

WINFIELD  
UNITED



GROWMARK

## About ESA-NCB

The North Central region encompasses a large geographic area (14 states and 3 Canadian provinces) and represents a diversity of crops, environments, and cultures that pose a range of entomological challenges. This includes:

In the United States: Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. In Canada: Manitoba, Nunavut, Ontario (west of 80° longitude)

Each year, the Branch holds an annual meeting featuring research updates through submitted symposia, papers, and posters; member networking; recognition of undergraduate and graduate student achievements; and opportunities for early career professionals to meet and develop collaborations. Students may compete in paper and poster presentations, a number of recognition awards, travel scholarships, and the Linnaean Games.

We encourage you to use the meeting website and the detailed online schedule for all current information and to navigate the meeting.

### MEETING WEBSITE:

<https://www.entsoc.org/northcentral>

### SOCIETY WEBSITE:

<https://entsoc.org>

### FACEBOOK:

[https://www.facebook.com/NCB\\_StudentAffairs-329695447858797/](https://www.facebook.com/NCB_StudentAffairs-329695447858797/)

### TWITTER:

@NCB\_SAcommittee

#NCB\_SAC

# Meeting Information

## Meeting Logistics

### 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 Hyatt Regency Cincinnati North Foyer. Registration will be open for check-in (pre-registered attendees) and for on-site registration at the following times:

Sunday .....	11:00 AM – 6:00 PM
Monday .....	7:30 AM – 4:00 PM
Tuesday .....	7:30 AM – 4:00 PM
Wednesday .....	7:45 AM – 10:00 AM

### Code of Conduct

By attending the 2019 North Central Branch Annual Meeting, you agree voluntarily to abide by our ethics policy. The full policy may be found online at [entsoc.org/conduct](http://entsoc.org/conduct). If you need to file a complaint, please contact Rosina Romano at [rromano@entsoc.org](mailto:rromano@entsoc.org), 703-593-0222.

### Statement on Diversity & Inclusion

The Entomological Society of America (ESA) is a professional organization dedicated to furthering the science and awareness of entomology through the advancement and professional development of all its members. ESA acknowledges and values all dimensions of diversity. Therefore, we welcome into our Society and encourage the participation of all individuals who are interested in entomology regardless of age, gender, gender identity, race, cultural background, religion, physical ability, sexual orientation, professional status, geographic location, and all other characteristics that make our members unique.

ESA actively promotes inclusion, recruitment, and retention in every aspect of the Society – including but not limited to

membership, leadership, committees, and staff. We strive to cultivate a scientific society of excellence built on mentorship, encouragement, tolerance, and mutual respect. ESA is committed to proactively rejecting and denouncing prejudice and stereotyping whenever it is encountered in the Society or the profession.

### 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 AV room (Hoosier A) to request assistance.

### Recording Policy

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. Thank you for your cooperation.

### Audiovisual and Upload of Presentations

**For All Presenters:** Presentations should be created in a format compatible with MS Office-PowerPoint (.pptx). All meeting rooms will be equipped with an LCD projector, projector screen, computer and microphone. The AV room (Hoosier A) will have computer for presenters to load and

preview presentations. **Please upload your presentation no less than two hours before the start of your session.** Folders with Session or Symposium Names will be provided—please upload your talk in the appropriate folder. Please name your presentation with your “Presentation-Number\_Last Name\_First Name”. 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.

**For Moderators:** 20 minutes before the start of your session, you must come to the AV room (Hoosier A) to copy your session’s folder onto a flash drive. There will be a laptop in each presentation room where you can transfer the session folder containing the presentations.

## Poster Presentations

Posters must be contained within the 36 x 48 inch (Width x Length) space provided. The poster must NOT exceed the size limit. Posters will be mounted according to the signage provided. We will provide Velcro/ tacks to secure your display to the poster board.

**Set Up:** Posters will be displayed in the Regency South Foyer. Student competition posters should be setup Sunday, March 17 between 4:00 – 8:00 PM and should remain posted until takedown on Monday, March 18 from 5:00 – 6:00 PM. Regular submission posters should be setup Monday, March 18 between 6:00 – 8:00 PM and should remain posted until takedown on Tuesday, March 19 from 6:00 – 8:00 PM.

**Author Presence:** Presenters for Student Competition posters should stand by their poster between **2:00 – 3:00 PM (odd numbers)** and **3:00 – 4:00 PM (even numbers)**. Submitted poster presenters should be present from **10:00 – 11:00 AM (odd numbers)** and **2:00 – 3:00 PM (even numbers)**.

## Moderator and Student Competition Judge Training

A Moderator and Student Competition Judge training session will be held on Sunday at 5:00 PM in the Bluegrass AB meeting room. Judging packets will be distributed at that time.

## Program Changes, Messages, Lost and Found

Please notify Program Chair, Jen Pechal (pechalje@msu.edu), about any program changes. Also, notices concerning program changes can be submitted to the Meeting Registration Desk. A message board for posting meeting announcements will be displayed in the AV and Employment Opportunity room (Hoosier A). Lost and found items may be turned in and retrieved at the Registration Desk.

### Employment Opportunity Center change to Message Boards

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

## Refreshments

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

## Hotel Amenities

**Food and Beverage:** The Hyatt Regency has a few dining options. Red Roost Tavern is located on the main lobby and is open for breakfast, lunch and dinner along with morning coffee. A convenience store (The Market) is also located near the main lobby and offers snacks and beverages.

**Internet:** There is complementary Wi-Fi, Hyatt Regency Free Wi-Fi, available in public spaces to meeting participants. Please be courteous when using the internet during your stay. Refrain from streaming large files, such as video, so that everyone will have access to the internet. People staying at the Hyatt Regency will have a separate passcode for their sleeping rooms (provided at check-in).

**Parking:** Valet parking is available at the hotel for \$35/day. Multiple parking garages are available near the hotel that range in price from \$10-20/day.

**Airport Shuttle:** Shuttle service can be reserved through Executive Transportation (800-990-8841) or be booked at the Cincinnati Northern Kentucky Airport (CVG). One way is \$26/per person or roundtrip at \$40/per person. Taxi and Uber/Lyft are available, which will range from \$20-40 for a one-way trip.

## Directions to the Hyatt Regency Cincinnati

(151 W 5th St, Cincinnati, OH 45202):

### FROM THE NORTH AND THE WEST (I-74) VIA I-75

Take the Second Street, Exit 1B.  
Merge on to Second Street to head east  
Turn left on Elm Street  
Hotel will be on the corner of Elm and 5th Street.

### FROM THE NORTH VIA I-71

Take the Third Street Exit towards Riverfront/Downtown to head west  
Turn right on Elm Street  
Hotel will be on the corner of Elm and 5th Street.

### FROM THE EAST VIA COLUMBIA PARKWAY (U.S. 50)

Merge onto 6th Street Expressway  
Follow signs to 2nd street and continue east  
Turn left on Elm Street  
Hotel will be on the corner of Elm and 5th Street.

### FROM THE SOUTH VIA I-75/I-71

Exit onto Second St toward downtown  
Turn left on Elm Street  
Hotel will be on the corner of Elm and 5th Street.

## Parent Resources

This unstaffed room has been made available for parent and family use during the NCB-ESA Meeting. It is located in the Wildcat meeting room in The Hyatt Regency.

Sunday ..... 7:30 AM – 10:00 PM  
Monday ..... 7:30 AM – 10:00 PM  
Tuesday ..... 7:30 AM – 10:00 PM  
Wednesday ..... 7:30 AM – 2:00 PM

## Accessibility Features

The Hyatt Regency is committed to providing equal access and opportunity for individuals with disabilities. The features also make The Hyatt Regency more accessible for older individuals with changing abilities to ensure a seamless experience. Accessible Hotel Areas with Accessible Routes from Accessible Public Entrance: Guestroom(s), Public Entrance, Swimming pool, and Registration desk.

## Special Events

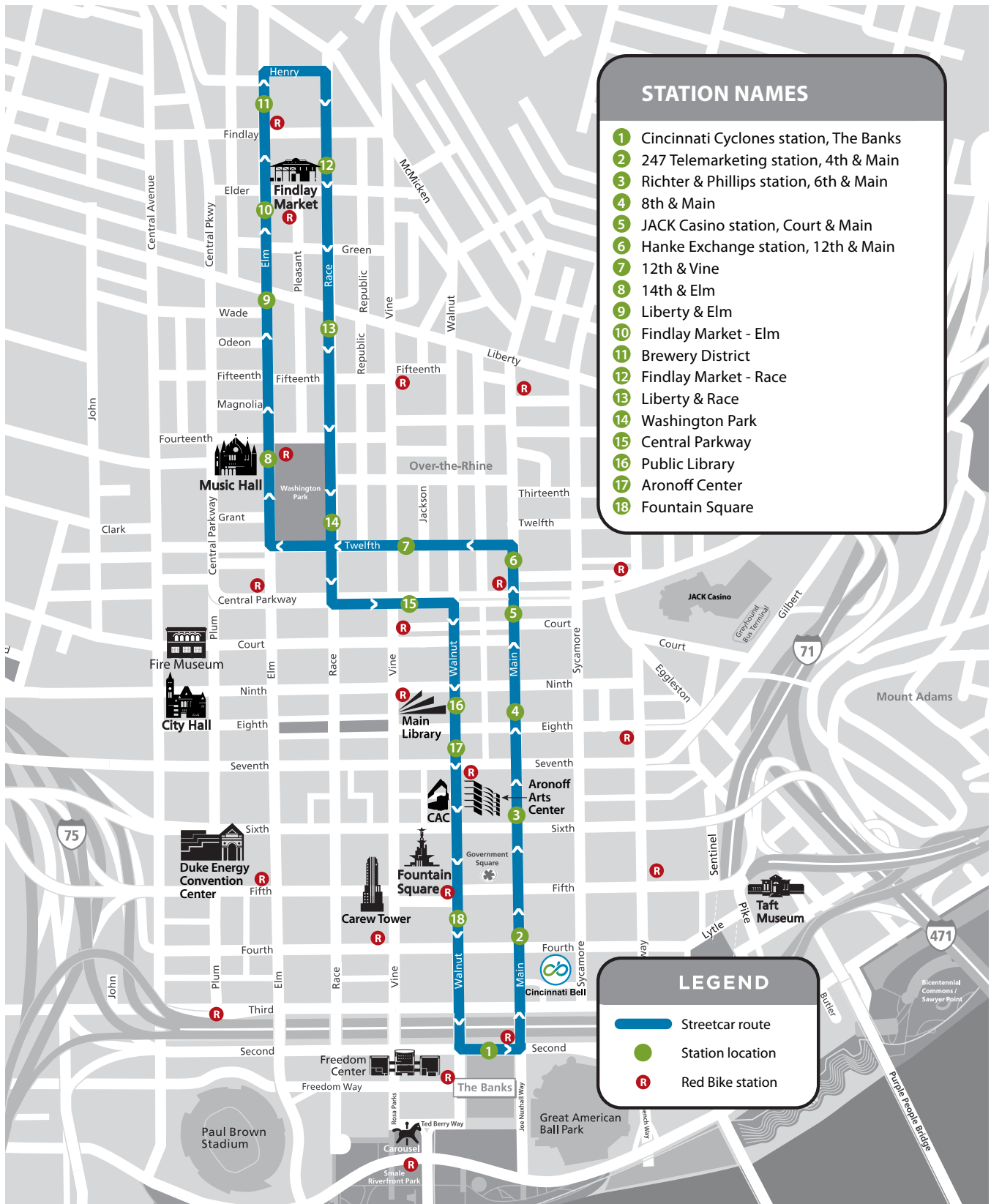
**Cincinnati Bug Bash:** Join the Student Affairs Committee at the Cincinnati Zoo ([cincinnatizoo.org](http://cincinnatizoo.org)) for a joint outreach event with schools from across the Branch as well as Milan Busching, the founding curator of the Cincinnati Zoo Insectarium. This event will take place on Saturday, March 16 at the Insectarium from 12:00 – 4:00 pm. There will be many activities spanning all aspects of entomology. This event will make the branch as well as the society more visible to the public and allow many schools to reach an audience they normally wouldn't see. We hope you are able to join us!

**Student Networking Event:** Starting at 7:45 PM on Monday (March 18), students are invited to an informal networking event at the Rhinegeist Brewery ([rhinegeist.com](http://rhinegeist.com)). Please note that this location is 21+ after 8:00 pm and students must bring badges to receive drink tickets.

**Early Career Professionals (ECP) Networking Event:** Starting at 7:30 PM on Monday (March 18), ECP and any other interested parties, are invited to an informal networking event at Taft's Ale House ([taftsalehouse.com](http://taftsalehouse.com)).

**Brewery Tour:** Starting at 6:00 PM on Tuesday (March 19), attendees are invited to tour two-three local breweries with the local arrangements chair (Joshua Benoit) and program chair (Jen Pechal). The visits will last ~40 minutes each. The tour is free except for the cost of the street car (\$2), see map below. If you would like to attend, please notify Joshua Benoit ([joshua.benoit@edu](mailto:joshua.benoit@edu)), so he can inform the brewery of expected numbers.





**Cincinnati Bell** connector

## Information about the City

### DOWNTOWN

Cincinnati Music Hall and Washington Park  
1230 Elm St, Cincinnati, OH 45202

This music hall and many surrounding buildings are considered historic landmarks.

### FINDLEY MARKET

1801 Race St, Cincinnati, OH 45202

This is the local market for the city. Many vendors for food and crafts are available.

### CINCINNATI REDS HALL OF FAME & MUSEUM

100 Joe Nuxhall Way, Cincinnati, OH 45202

Exhibits & memorabilia commemorating famous players & moments in Reds history, plus ballpark tours.

### NATIONAL UNDERGROUND RAILROAD FREEDOM CENTER

50 E Freedom Way, Cincinnati, OH 45202

The National Underground Railroad Freedom Center is a museum in downtown based on the history of the Underground Railroad.

### LOCAL (~10-MINUTE DRIVE)

#### EDEN PARK

950 Eden Park Drive 45202

An urban park located in the Walnut Hills and Mt. Adams neighborhoods of Cincinnati, Ohio. The hilltop park offers numerous overlooks of the Ohio River valley.

#### SPRING GROVE CEMETERY & ARBORETUM

4521 Spring Grove Ave, Cincinnati, OH 45232

The second largest cemetery in the United States and recognized as a US National Historic Landmark

#### CINCINNATI ART MUSEUM (IN EDEN PARK)

953 Eden Park Dr, Cincinnati, OH 45202

Founded in 1881, it was the first purpose-built art museum west of the Alleghenies. Its collection of over 67,000 works spanning 6,000 years of human history make it one of the most comprehensive collections in the Midwest.

#### CINCINNATI ZOO & BOTANICAL GARDEN

3400 Vine St, Cincinnati, OH 45220

The zoo houses over 500 animals and 3,000 plant species. In addition, the zoo also has conducted several breeding programs in its history.

#### CINCINNATI MUSEUM CENTER

1301 Western Ave, Cincinnati, OH 45203

Houses museums, theaters, a library, and a symphonic pipe organ, as well as special travelling exhibitions.

For more information about things to do during your visit to Cincinnati, visit: [cincinnatiusa.com/things-to-do/all](http://cincinnatiusa.com/things-to-do/all) and [tripadvisor.com/Attractions-g60993-Activities-Cincinnati\\_Ohio.html](http://tripadvisor.com/Attractions-g60993-Activities-Cincinnati_Ohio.html).

---

# 2019 NCB-ESA Meeting Organizers

---



**Dr. Bill Ravlin**  
President



**Dr. Erin Hodgson**  
Secretary / Treasurer



**Dr. Jen Pechal**  
Program Chair



**Dr. Josh Benoit**  
Local Arrangements Chair



**Dr. Priyanka  
Mittapelly**  
Student Rep – Executive  
Committee

# NCB-ESA Committee Information

## Executive Committee

### **PRESIDENT**

Bill Ravlin, Michigan State University

### **PRESIDENT-ELECT**

Andy Michel, The Ohio State University

### **PAST PRESIDENT**

John Ruberson, University of Nebraska-Lincoln

### **SECRETARY / TREASURER**

Erin Hodgson, Iowa State University

### **STUDENT REPRESENTATIVE**

Priyanka Mitttapelly, The Ohio State University

### **NCB REPRESENTATIVE TO GOVERNING BOARD**

Gary Brewer, University of Nebraska-Lincoln

### **MEMBER-AT-LARGE 1**

Clint Pilcher, DuPont Pioneer

### **MEMBER-AT-LARGE 2**

Laura Campbell, Corteva Agriscience

### **MEMBER-AT-LARGE 3**

Ana Maria Vélez, University of Nebraska-Lincoln

## Local Arrangements Committee

### **CHAIR**

Josh Benoit, University of Cincinnati

### **COMMITTEE MEMBERS**

Andrew Rosendale, University of Cincinnati

## Program Committee

### **CHAIR**

Jen Pechal, Michigan State University

## Students Affairs Committee

### **CHAIR**

Amanda Skidmore, University of Kentucky

### **VICE-CHAIR / OHIO.**

Chris Riley, The Ohio State University

### **AWARDS CZAR**

Clint Pilcher, DuPont Pioneer

### **IOWA STATE**

Kelsey Fisher, Iowa State University

### **MINNESOTA**

Edwin Benkert, University of Minnesota

### **MICHIGAN STATE**

Zinan Wang, Michigan State University

### **WISCONSIN**

Bonnie Jean Ohler, University of Wisconsin

### **MISSOURI**

Jessica Kansman, University of Missouri

*Student Affairs, cont'd*

#### **SOUTH DAKOTA STATE**

Sophia Conzemius, South Dakota State University

#### **ILLINOIS**

Todd Johnson, University of Illinois, Urbana-Champaign

#### **KANSAS STATE**

Grace Craigie, Kansas State University

#### **PURDUE**

John Ternest, Purdue University

#### **KENTUCKY**

Laura Rosenwald, University of Kentucky

#### **NEBRASKA**

Sajjan Grover, University of Nebraska-Lincoln

#### **UNIV. OF GUELPH**

Aleksandra Dolezal, University of Guelph

#### **COLORADO STATE**

Ryan Paul, Colorado State University  
Melissa Schreiner, Colorado State University

#### **NCB REPRESENTATIVE TO ESA SAC**

Emily Justus, The Ohio State University

## **Student Awards Committee**

#### **CHAIR**

Mark Asplen, Metropolitan State University

#### **MEMBERS**

Amit Sethi, DuPont Pioneer  
Mike McCarville, Iowa State University  
Amy Raudenbush, The Ohio State University  
Laramy Enders, Purdue University  
Nick Teets, University of Kentucky

#### **STUDENT REPRESENTATIVE**

Edwin Benkert, University of Minnesota

## **Professional Awards Committee**

#### **CHAIR**

Scott Williams, DNT

#### **MEMBERS**

Bruce Barrett, University of Missouri  
Justin McMechan, University of Nebraska-Lincoln  
Jan Knodel, Purdue University  
Wendy Klooster, The Ohio State University  
Marlin Rice, DuPont Pioneer

#### **STUDENT REPRESENTATIVE. . . . .**

Jessica Kansman, University of Missouri

## **Honorary Awards Committee**

#### **CHAIR**

Jason Harmon, North Dakota State University

#### **MEMBERS**

Steve Bradbury, Iowa State University  
Kacie Athey, University of Kentucky  
Erin O'Brien, The Ohio State University  
Kevin Rice, University of Missouri  
Louis Hesler, USDA-ARS

#### **STUDENT REPRESENTATIVE**

Jessica Kansman, University of Missouri

## **BCE Awards Committee**

#### **CHAIR**

Phil Sloderbeck, Kansas State University

## **Nominating Committee**

#### **CHAIR**

Boris Castro, DOW

#### **MEMBERS**

Zsafia Szendrei, Michigan State University  
Deane Jorgenson, Syngenta

## Audit Committee

### CHAIR

Matt Carroll, Bayer

### MEMBERS

Elane Fishilevich, University of Nebraska-Lincoln

Alice Harris, BASF

## Photo Salon Committee

### CHAIR

Tom Myers, All-Rite Pest Control

### MEMBERS

Ric Bessin, University of Kentucky

Gary Hein, University of Nebraska-Lincoln

David Voegtlin, University of Illinois, Urbana-Champaign

## ESA Representatives

### AWARDS AND HONORS COMMITTEE

Deirdre Prischmann-Voldseth, North Dakota State University

### CERTIFICATION COMMITTEE

Gary Brewer, University of Nebraska-Lincoln

### SCIENCE POLICY COMMITTEE

Marianne Alleyne, University of Illinois, Urbana-Champaign

### EARLY CAREER PROFESSIONALS COMMITTEE

Hannah Penn, Miami University

### DIVERSITY AND INCLUSION COMMITTEE

Susan Moser, DuPont  
PioneerZsafia Szendrei, Michigan State University

---

# Special Acknowledgements

## A SPECIAL THANKS TO THE FOLLOWING:

ESA Central Staff: Becky Anthony

Confex Staff, especially Amy Coli for program assistance and Karen Morrissey for the program book assembly.

Hyatt Regency Staff, especially Melissa Buday, Senior Event Planning Manager

All of our moderators, Student Competition judges, and student volunteers

All of our meeting sponsors



---

# 2019 AWARDS

---

## 2019 NCB-ESA Award Winners

### C.V. Riley Achievement Award



**Dr. Charles  
Michael Smith**  
Kansas State University

Dr. Charles Michael (Mike) Smith is a Professor of Entomology in the Department of Entomology at Kansas State University. He is a native of Oklahoma, where he received a B.S. in Biology from Southwestern Oklahoma State University, followed by PhD and MS degrees from Mississippi State University, and an appointment as a postdoctoral research associate in the Department of Entomology at North Carolina State University. He later served as Professor of Entomology at Louisiana State University and Chair of the Entomology Division at The University of Idaho. Dr. Smith has served on the faculty at Kansas State University since 1990 and served as department head for six years. His research focuses on the genetic and transcriptomic interactions of arthropod pests with soybean and wheat plants. He teaches or has taught courses in methods of the evaluation of plant resistance to pests, general entomology (classroom & distance), plant resistance to arthropods and plant resistance to pests. Mike has trained 18 graduated students and 12 postdoctoral scientists from 13 different countries and served as external examiner of dissertations at the Royal Veterinary and Agricultural University (Copenhagen), University of Pretoria, University of Johannesburg and University of Bodenkultur (Vienna). Smith's scientific publications include three texts in plant resistance to arthropods; and 18 book chapters and reviews, including (Smith CM, Clement SL. 2012. Molecular bases of plant resistance to arthropods. Annu. Rev. Entomol.); and 115 refereed journal manuscripts. Smith is a recipient of the Kansas State University Gamma Sigma Delta Distinguished Faculty Award, the Entomological Society of America Recognition Award, and he was named a Fulbright scholar at the Czech Agricultural University. He is also a fellow of the Entomological Society of America and the American Association for the Advancement of Science.

## Award of Merit



**Dr. Kelley Tilmon**  
The Ohio State University

Dr. Kelley Tilmon is an Associate Professor in the Department of Entomology at Ohio State University, where she has worked since 2016 as a field crop entomologist with extension, research, and teaching responsibilities. Prior to that she was on the faculty of South Dakota State University. She obtained her Ph.D. in Entomology from Cornell University, and an M.S. in Entomology and B.A. in Biology and in English from the University of Delaware. Dr. Tilmon's service to the North Central Branch includes Program Chair for the 2013 NCB meeting, upcoming Program Chair for the 2020 meeting, NCB Awards Coordinator (2014-2015), and 4 NCB professional award judging panels. Her service to the national body of the ESA includes serving as a Subject Editor for *Annals of the ESA* (2008 to present), 3 professional award judging panels, and a member of the ESA Renewal Advisory Council (2006-2007) responsible for advising the Governing Board on a new organizational model for the society.

## Legacy Contribution Award



**Dr. Kun Yan Zhu**  
Kansas State University

Dr. Kun Yan Zhu is University Distinguished Professor of Entomology at Kansas State University (KSU). He earned his Ph.D. degree in Biology from Utah State University in 1992 and worked as a postdoctoral researcher at the University of Massachusetts-Amherst from 1992 to 1995. He has been on the faculty at KSU since 1996, where he teaches Toxicology of Insecticides and Molecular Entomology, and conducts research in insect molecular toxicology and RNA interference. Zhu has authored 168 peer-reviewed papers and reviews, 15 book chapters, and more than 350 presentations (138 invited). He has served as major or co-major professor for 25 graduate students and as supervisory committee member for other 46 graduate students at KSU. He has mentored 48 postdoctoral fellows, visiting professors and scholars from seven different countries. Zhu has served as an editor or editorial board member for 13 scientific journals and handled peer review processes of numerous manuscripts. He has reviewed more than 440 manuscripts for 65 scientific journals. Zhu received the C.V. Riley Achievement Award in 2009 and the Recognition Award in Entomology in 2011 from the ESA North Central Branch, and the Distinguished Graduate Faculty Award in 2014 and the College of Agriculture Excellence in Graduate Teaching Award in 2016 from KSU. He was named University Distinguished Professor in 2017. Zhu was elected as a Fellow of the American Association for the Advancement of Science (AAAS) in 2012 and a Fellow of the Entomological Society of America in 2014.



## Distinguished Achievement Award in Extension



**Dr. Susan Jones**  
The Ohio State University

Dr. Susan C. Jones is a Professor and Extension State Specialist in the Entomology Department at The Ohio State University. Prior to her university appointment in 2000, she was a Principal Entomologist with the USDA Forest Service, where she studied termites for 14 years. She received her B.S. and M.S. degrees from Louisiana State University and her Ph.D. from the University of Arizona.

Dr. Jones' research and extension program focuses on the biology, ecology, and management of household and structural insect pests. She is nationally and internationally recognized as an expert on termites and bed bugs. Dr. Jones has published more than 200 scientific and extension articles and several book chapters and books. She has given >550 extension presentations and >160 scientific presentations on urban entomology topics at professional meetings nationally and internationally. Her extension products include facts sheets and bulletins; trade magazine articles; news media interviews; in-depth training classes and workshops; insect identification cards; a bed bug pocket guide; children's head lice awareness stickers; insect display cases; webinars; and websites. Her recent educational app, *Bed Bug Guide*, features 15 chapters and is free to the public; the app received >8,000 installs worldwide within months after its introduction in October 2018. Dr. Jones is a founding member of the Central Ohio Bed Bug Task Force and has served

on numerous regional and national bed bug task forces. Dr. Jones has been the recipient of many awards, including the USDA Certificate of Merit for Research & Publication Accomplishments (1994), NCUE's Recognition Award for Outstanding Leadership and Dedication (2010), the pest management industry's Crown Leadership Award (2012), and the NCB-ESA Recognition Award in Urban Entomology (2012). As a M.S. student at LSU, she was the first woman inducted into Pi Chi Omega, a pest management industry fraternity. At OSU, Dr. Jones has mentored numerous high school, undergraduate, and graduate students; she has taught courses in Urban Entomology, Presentation Skills, and Scientific Writing. She has been an active member of ESA.

## Award of Excellence in Integrated Pest Management



**Dr. Robert Koch**  
University of Minnesota

Dr. Robert (Bob) Koch is an Associate Professor and Extension Entomologist in the Department of Entomology at the University of Minnesota. Bob is originally from Minnesota, where he grew working on his grandparents' farm. He received a B.A. in Biology from St. John's University and a Ph.D. in Entomology from the University of Minnesota. Bob worked for six years as an entomologist with the Minnesota Department of Agriculture. He joined the faculty at the University of Minnesota in 2013. His research and extension efforts are related to integrated pest management of soybean insects. Recently, these efforts have focused primarily on the emerging challenges posed by insecticide resistance in soybean aphid and the emerging threat posed by stink bugs in northern soybean production. Bob leads an active laboratory supported by extramural funding from federal and state agencies, regional and state commodity groups, and industry. He has published 64 peer-reviewed scientific articles and served on the Editorial Board for *Environmental Entomology*. Furthermore, he disseminates his findings to stakeholders (growers, consultants, agronomists, etc.) through an active extension program, with 100+ extension publications and 140+ extension presentations.

## Excellence in Early Career Award



**Dr. William (Rob)  
Morrison**  
USDA-ARS

Dr. Rob Morrison is originally from Mesa, AZ. He graduated cum laude with his B.A. in biology from Kalamazoo College in 2006. Afterwards, he researched the ecology of two closely related species of ants at the University of Munich in Germany, where he graduated with his M.S. in ecology, evolution, and systematics in 2009. Rob received his Ph.D. from the Department of Entomology at Michigan State University in 2014. His doctoral work focused on developing an IPM program for the asparagus miner. For about 2 years, Rob was a post-doctoral researcher at the USDA-ARS Appalachian Fruit Research Station. During that time, he helped to develop an attract-and-kill program for the invasive brown marmorated stink bug, and led research on the biological control of and monitoring tools for the species. Rob is currently a Research Entomologist with the USDA-ARS Center for Grain and Animal Health Research in Manhattan, KS. He is currently researching the chemical and behavioral ecology of stored product insects to develop behaviorally-based management strategies. Rob has been highly active in ESA, acting as a subject editor for Behavior at Environmental Entomology, serving on 20+ committees at the branch, section, and national level, and organizing 30 symposia at branch and national meetings. Finally, he has published 38 peer-reviewed manuscripts, obtained over \$8.5 million in grants as PI and Co-PI, given 170+ research and extension presentations in 30 states and eight countries, and reached out to over 19,000 members of the public in his career, including to youth and adults.

## J.H. Comstock Graduate Student Award



**Dr. Ryan B. Schmid**

Ryan Schmid is a recent graduate of Kansas State University, where he received a Ph.D. in Entomology under the direction of Dr. Brian McCornack. He received B.S. degrees in Biology and Microbiology in 2011 from South Dakota State University, and completed an M.S. degree in Biology from South Dakota State University in 2014. Ryan became interested in entomology while working as an undergraduate biological science aid in an entomology research lab for Dr. Jonathan Lundgren at the USDA – ARS in Brookings, SD. Ryan's research interests focus on insect ecology and pest management, and applying those interests to help farmers innovate their conventional farming systems. Ryan's career goal is to work closely with farmers to develop sustainable solutions to produce food, fuel, and fiber with minimal adverse impacts on the land.

## Graduate Student Scholarship Award



**Sajjan Grover**

Sajjan Grover received his bachelor's degree in Agriculture from Punjabi University and Master's in Entomology from Punjab Agricultural University, India. He started his PhD at University of Nebraska-Lincoln under the supervision of Dr. Joe Louis in Spring 2017. His main research interests are molecular plant-insect interactions and plant defense mechanisms. Sajjan's PhD research focuses on characterization of sorghum defense responses to insect herbivory with an emphasis on lignin biosynthesis pathway as a defense mechanism to fall armyworm and sugarcane aphids. He also contributes to collaborative projects on sorghum-greenbug and maize-corn leaf aphids interaction. Moreover, Sajjan has participated in various outreach activities, and serving on various committees such as fundraising committee and outreach committee. He is also the UNL Student Representative to the North Central Branch Student Affairs Committee.

## Workshop Award

Presented by BCEs of Mid-America



**Dr. Erin Hodgson**  
Iowa State University



**Dr. Brian McCornack**  
Kansas State University

The workshop Award is presented to Erin Hodgson (Iowa State University) and Brian McCornack (Kansas State University). Project Title: Be the Nerd with a Share Fair! Project Description: In 2018, Brian and Erin co-organized and moderated two workshops to highlight hands-on extension activities to engage stakeholders. Their goal was to increase awareness of the value of extension entomology to our target audience of students and early-career professionals. Brian and Erin also wanted to provide a workshop where people could actively learn a few new ways to interact with stakeholders and be inspired to help people learn about insects. More than 300 people attended the two Share Fair workshops in 2018. Most of the participants were young people (i.e., graduate students) and not aware of what it means to have an extension program. Co-organizers of the Share Fairs, Brian and Erin, increased awareness of what extension entomologists do, how they communicate, and highlighted a few ways to be more engaging with an audience.



## Book Award

### Presented by BCEs of Mid-America



**Katherine Turo**  
The Ohio State University

The Book Award is presented to Katherine Turo (The Ohio State University). Project Title: Adventures with Insects. Project Description: Ohio's 4-H entomology program has historically impacted Ohio's youth and motivated them to pursue careers in science. To increase the accuracy, accessibility, and appeal of Ohio's 4-H entomology program, Katie led a collaborative team of Ohio State entomologists, extension specialists, and 4-H staff in re-designing Ohio's project books. Both the structure and content of the 1990 beginner and intermediate project books were changed, and three new books (Insect Adventures I, II and III) were published in 2018 and 2019. These activity books focus on entomology basics, self-directed experiments and observations, citizen science projects, backyard biodiversity, and a capstone collection project. This project will enhance the quality of 4-H entomology in Ohio, and is a step forward in encouraging STEM participation and entomological knowledge within the state. By re-designing Ohio 4-H's curriculum, adding an additional "expert" level project book, and creating supplementary online resources to reinforce learning, these books will engage Ohio's youth in entomology and facilitate positive STEM learning experiences. At least 500 youth will complete an entomology project every year and that this number may dramatically rise with new curriculum.

## Student Travel Scholarship Winners

### CHLOE ALBIN

*Kansas State University*

### LOGAN APPENFELLER

*Michigan State University*

### MARGUERITE BOLT

*Purdue University*

### DANIEL BUSH

*University of Illinois at Urbana-Champaign*

### KAITLIN CHAPMAN

*University of Nebraska-Lincoln*

### ELLEN DUNKLE

*The Ohio State University*

### KELSEY FISHER

*Iowa State University*

### SAJJAN GROVER

*University of Nebraska-Lincoln*

### GABRIELA INVENINATO CARMONA

*University of Nebraska – Lincoln*

### COURTNEY LARSON

*Michigan State University*

### SHIANNE LINDSAY

*SUNY-ESF*

### MORGAN MACKERT

*Iowa State University*

### JAMES MIKSANEK

*University of Minnesota*

### PRIYANKA MITTAPELLY

*The Ohio State University*

### VALERIE NGUYEN

*Kansas State University*

### DENISHA PARKER

*The Ohio State University*

### DONNIE PETERSON

*Wright State University*

### HANNAH QUELLHORST

*Kansas State University*

### JORDAN REINDERS

*University of Nebraska-Lincoln*

### KYLE TURNER

*Indiana University Purdue University  
Indianapolis*

### ALEXANDER TYRPAK

*The Ohio State University*

### RACHEL WILKINS

*Kansas State University*

# Program Schedule

## SATURDAY, MARCH 16, 2019

Program	Time	Location
Cincinnati Bug Bash	12:00 PM - 4:00 PM	

## SUNDAY, MARCH 17, 2019

Program	Time	Location
Parents' Room	7:30 AM - 10:00 PM	Wildcat
NCERA 220 Working Group Meeting	8:00 AM - 12:00 PM	Hoosier B
Executive Committee Meeting	10:00 AM - 12:00 PM	Hoosier A
Registration	11:00 AM - 6:00 PM	Regency North Foyer
AV and Employment Opportunity Room	12:00 PM - 6:00 PM	Hoosier A
Workshop: Better Science Through Storytelling	1:00 PM - 3:00 PM	Buckeye AB
NCAC-15 Working Group Meeting	2:00 PM - 5:00 PM	Hoosier B
Global Food Security in an Era of Climate Uncertainty: Opportunities for Entomologists	3:00 PM - 5:00 PM	Bluegrass AB
Integrated Approaches to Understanding and Improving Bee Health	3:00 PM - 5:00 PM	Buckeye AB
Judges and Moderators Training	5:00 PM - 5:30 PM	Bluegrass AB
Linnaean Games - Preliminary Rounds	5:00 PM - 7:00 PM	Buckeye AB
Opening Session and Business Meeting	7:00 PM - 7:30 PM	Findlays
Welcome Reception	7:30 PM - 10:00 PM	Sungarden #3

## Program Schedule

### MONDAY, MARCH 18, 2019

Program	Time	Location
AV and Employment Opportunity Room	7:30 AM - 5:00 PM	Hoosier A
Parents' Room	7:30 AM - 10:00 PM	Wildcat
Registration	7:30 AM - 4:00 PM	Regency North Foyer
B.S. Student Ten-Minute Paper Competition	8:00 AM - 9:40 AM	Bluegrass A
M.S. Student Ten-Minute Paper Competition (MUVE, PBT, SysEB Session)	8:00 AM - 9:40 AM	Bluegrass B
M.S. Student Ten-Minute Paper Competition (P-IE Session I)	8:00 AM - 10:00 AM	Buckeye A
B.S. Student Poster Competition	8:00 AM - 5:00 PM	Regency South Foyer
M.S. Student Poster Competition	8:00 AM - 5:00 PM	Regency South Foyer
Ph.D. Student Poster Competition	8:00 AM - 5:00 PM	Regency South Foyer
M.S. Student Ten-Minute Paper Competition (P-IE Session II)	10:00 AM - 12:00 PM	Bluegrass B
Ph.D. Student Ten-Minute Paper Competition (MUVE, PBT, SysEB Session)	10:00 AM - 11:40 AM	Bluegrass A
Ph.D. Student Ten-Minute Paper Competition (P-IE Session I)	10:00 AM - 11:40 AM	Buckeye A
Student and Early Career Professional Luncheon: TBD	12:00 PM - 1:15 PM	
Entomological Research and Technological Innovation	1:30 PM - 5:30 PM	Bluegrass B
Linking Genes to Behavior: Expanding the Targets for Behaviorally-Based Management of Insects	1:30 PM - 3:30 PM	Buckeye A
The Mutual Benefits of Connecting Scientists to Teachers and Schools	1:30 PM - 3:30 PM	Bluegrass A
M.S. Student Ten-Minute Paper Competition (P-IE Session III)	1:30 PM - 3:30 PM	Buckeye B
Ph.D. Student Ten-Minute Paper Competition (P-IE Session II)	3:30 PM - 5:10 PM	Bluegrass A
Linnaean Games - Final Rounds	5:30 PM - 7:30 PM	Bluegrass AB
Photo Salon	5:30 PM - 6:30 PM	Bluegrass A
NCB Early Career Professional Networking	7:30 PM - 10:00 PM	
Student Mixer	7:45 PM - 10:00 PM	

## Program Schedule

### TUESDAY, MARCH 19, 2019

Program	Time	Location
AV and Employment Opportunity Room	7:30 AM - 5:00 PM	Hoosier A
Parents' Room	7:30 AM - 10:00 PM	Wildcat
Registration	7:30 AM - 4:00 PM	Regency North Foyer
Emerging Crop Pests in the North Central Branch	8:00 AM - 12:00 PM	Bluegrass B
Pollinators and Biological Control: Overlap and Reciprocal Insights	8:00 AM - 12:00 PM	Buckeye B
Submitted Ten-Minute Presentations: PI-E Session II	8:00 AM - 10:00 AM	Bluegrass A
Regular Posters	8:00 AM - 5:00 PM	Regency South Foyer
Insects, Microbes and Decomposition	10:00 AM - 12:00 PM	Buckeye A
Awards Luncheon	12:00 PM - 1:30 PM	Regency A
Insect Herbivory and the Plant Microbiome	1:30 PM - 5:30 PM	Buckeye B
Monitoring, Mitigation, and Miticide: What IPM Strategies Improve Honey Bee and Native Bee Health?	1:30 PM - 3:30 PM	Buckeye A
Submitted Ten-Minute Presentations: MUVE, PBT, SysEB Session	1:30 PM - 3:30 PM	Bluegrass A
Niche Specialization: Communicating Science to Targeted Audiences	3:30 PM - 5:30 PM	Bluegrass A
Submitted Ten-Minute Presentations: PI-E Session I	3:30 PM - 5:30 PM	Buckeye A
Late-Breaking Posters	5:00 PM - 7:30 PM	Regency South Foyer
Student Affairs Committee Meeting	5:30 PM - 7:00 PM	Bluegrass A

### WEDNESDAY, MARCH 20, 2019

Program	Time	Location
AV and Employment Opportunity Room	7:30 AM - 12:00 PM	Hoosier A
Final Business Meeting	7:30 AM - 8:30 AM	Hoosier B
Parents' Room	7:30 AM - 2:00 PM	Wildcat
Registration	7:45 AM - 10:00 AM	Regency North Foyer
Insect Resistance: Challenges to Current Technologies	8:00 AM - 10:30 AM	Buckeye A
Hemp: A New Frontier for Entomology: We are planning 3 hours of talks followed by a discussion group.	8:00 AM - 12:00 PM	Bluegrass A
Taking a Step Back: Looking to Basic Biology and Behavior to Better Inform Pest Management	8:00 AM - 12:00 PM	Buckeye B
Executive Committee Final Meeting	12:00 PM - 2:00 PM	Hoosier B

# Oral & Poster Presentation Schedule

**SUNDAY, MARCH 17, 2019,  
AFTERNOON**

## Global Food Security in an Era of Climate Uncertainty: Opportunities for Entomologists

**Bluegrass AB (Hyatt Regency Cincinnati)**

**Moderators and Organizers:** Hannah Quellhorst, Kansas State Univ., Manhattan, KS and Rob Morrison, USDA - ARS, Manhattan, KS

**3:00 PM Welcoming Remarks**

**3:00 PM 1 IPM and biological control of major insect pests in East Africa and Latin America: Why global pests require global solutions.**  
*Luis Canas* (canas.4@osu.edu), The Ohio State Univ., Wooster, OH

**3:20 PM 2 Hermetic storage for insect management in eastern Kenya.**  
*Anastasia Njoroge* (annwanjiru608@gmail.com)<sup>1</sup>, Richard Mankin<sup>2</sup> and Dieudonne Baributsa<sup>1</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>USDA - ARS, Gainesville, FL

**3:40 PM 3 Post-harvest losses in Ghana: Assessment and solutions.**  
*James Campbell* (James.Campbell@ars.usda.gov)<sup>1</sup>, Paul Armstrong<sup>1</sup>, Frank Arthur<sup>1</sup>, James Danso<sup>2</sup>, Naomi Manu<sup>2</sup>, George Mbata<sup>3</sup>, Samuel McNeill<sup>4</sup>, George Opit<sup>1</sup> and Enoch A. Osekere<sup>2</sup>, <sup>1</sup>USDA - ARS, Manhattan, KS, <sup>2</sup>Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana, <sup>3</sup>Fort Valley State Univ., Fort Valley, GA, <sup>4</sup>Univ. of Kentucky, Princeton, KY

**4:00 PM Break**

**4:15 PM 4 Development of a low cost moisture meter for bagged grain and potential for reducing maize mycotoxin in Ghana.**  
*Paul Armstrong* (paul.armstrong@ars.usda.gov)<sup>1</sup>, Naomi Manu<sup>2</sup>, James Danso<sup>2</sup>, George Opit<sup>1</sup>, Samuel McNeill<sup>3</sup>, Frank Arthur<sup>4</sup>, James Campbell<sup>1</sup> and George N. Mbata<sup>5</sup>, <sup>1</sup>USDA - ARS, Manhattan, KS, <sup>2</sup>Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana, <sup>3</sup>Univ. of Kentucky, Princeton, KY, <sup>4</sup>USDA - ARS, Kearneysville, WV, <sup>5</sup>Fort Valley State Univ., Fort Valley, GA

**4:35 PM 5 New technologies for age old problems including how Bitcoin & Uber could change the face of African post-harvest commodity warehousing.**

*Georgina Bingham* (gvb@vestergaard.com)<sup>1</sup>, George Opit<sup>2</sup>, Leslie Rault<sup>3</sup>, Enoch A. Osekere<sup>4</sup>, Grace O. Otitodun<sup>5</sup> and Allan Mortensen<sup>1</sup>, <sup>1</sup>Vestergaard S. A., Lausanne, Switzerland, <sup>2</sup>USDA - ARS, Manhattan, KS, <sup>3</sup>Univ. of Nebraska, Lincoln, NE, <sup>4</sup>Kwame Nkrumah Univ. of Science and Technology, Kumasi, Ghana, <sup>5</sup>Nigerian Stored Products Research Institute, Ilorin, Nigeria

**4:55 PM Concluding Remarks**

## Integrated Approaches to Understanding and Improving Bee Health

**Buckeye AB (Hyatt Regency Cincinnati)**

**Organizers:** Hongmei Li-Byarlay, Central State Univ., Wilberforce, OH and Reed Johnson, The Ohio State Univ., Wooster, OH

**3:00 PM 6 Investigating the mite biting behavior of honey bees (*Apis mellifera*) in Ohio.**  
*Jada Smith and Hongmei Li-Byarlay* (hli-byarlay@centralstate.edu), Central State Univ., Wilberforce, OH

**3:15 PM 7 Is low aggression in honey bees a sickness behavior?**  
*Clare Rittschhof* (clare.rittschhof@uky.edu), Univ. of Kentucky, Lexington, KY

**3:30 PM 8 Longitudinal histological study of *Nosema ceranae* in honey bees.**  
*Katherine Kamminga* (katherine.kamminga@kysu.edu), Thomas C. Webster and Martin Matisoff, Kentucky State Univ., Frankfort, KY

**3:45 PM 9 Transportation sensitizes honey bees (*Apis mellifera*) to insecticides.**  
*Shudong Luo* (luoshudong@caas.cn), Chinese Academy of Agricultural Sciences, Beijing, China

**4:00 PM Break**

**4:05 PM 10 Beekeeping in the age of genomics.**  
*Brock Harpur* (b.harpur@gmail.com), Purdue Univ., West Lafayette, IN



- 4:20 PM 11 Stated willingness of private property owners to plant pollinator prairie or milkweed on large exurban parcels.**  
**Amélie Davis** ([davis.amelie@miamioh.edu](mailto:davis.amelie@miamioh.edu))<sup>1</sup>, Olivia Herron<sup>1</sup> and Alec Iruri-Tucker<sup>2</sup>, <sup>1</sup>Miami Univ., Oxford, OH, <sup>2</sup>Indiana Univ., Bloomington, IN
- 4:35 PM 12 Do honey bees forage on soybeans in Ohio?**  
**Reed Johnson** ([johnson.5005@osu.edu](mailto:johnson.5005@osu.edu))<sup>1</sup>, Luke Hearon<sup>2</sup>, Sreelakshmi Suresh<sup>2</sup>, Emma Matcham<sup>2</sup>, Tyler D. Eaton<sup>2</sup>, Rodney Richardson<sup>2</sup> and Chia Hua-Lin<sup>1</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>The Ohio State Univ., Columbus, OH
- 4:50 PM Discussion**

## MONDAY, MARCH 18, 2019, POSTERS

### B.S. Student Poster Competition / 8:00 AM-5:00 PM

#### Regency South Foyer (Hyatt Regency Cincinnati)

- D1 Developing an ovitrapping network for urban mosquito surveillance.**  
**Christoph Kositzke** ([christopher.kositzke@uky.edu](mailto:christopher.kositzke@uky.edu))<sup>1</sup>, Caitlin Stamper<sup>1</sup>, Amanda Skidmore<sup>2</sup> and Stephen Dobson<sup>1</sup>, <sup>1</sup>Univ. of Kentucky, Lexington, KY, <sup>2</sup>Purdue Univ., West Lafayette, IN
- D2 Susceptibility of stored product pests to the fungal mycotoxin deoxynivalenol (DON).**  
**Valerie Nguyen** ([ngueyval@ksu.edu](mailto:ngueyval@ksu.edu))<sup>1</sup>, Frank Arthur<sup>2</sup>, Thomas Phillips<sup>1</sup>, Matt Bakker<sup>3</sup>, Susan McCormick<sup>4</sup> and Erin Scully<sup>5</sup>, <sup>1</sup>Kansas State Univ., Manhattan, KS, <sup>2</sup>USDA - ARS, Kearneysville, WV, <sup>3</sup>USDA - ARS, Peoria, IL, <sup>4</sup>USDA - ARS, Peoria, IL, <sup>5</sup>USDA - ARS, Manhattan, KS
- D3 Effect of interspersed refuge on *Aphis glycines* virulence and natural enemy communities.**  
**Derek Burger** ([derekj.burger@gmail.com](mailto:derekj.burger@gmail.com)), Jessica Hohenstein, Erin Hodgson and Matthew O'Neal, Iowa State Univ., Ames, IA
- D4 Potential repellency of cedarwood oil from a novel extraction method to stored product insects.**  
**Chloe Albin** ([chloealbin@gmail.com](mailto:chloealbin@gmail.com))<sup>1</sup>, Hannah Quellhorst<sup>2</sup>, James Campbell<sup>3</sup>, William Morrison<sup>3</sup> and Fred Eller<sup>4</sup>, <sup>1</sup>Kansas State Univ., Manhattan, KS, <sup>2</sup>Purdue Univ., West Lafayette, IN, <sup>3</sup>USDA - ARS, Manhattan, KS, <sup>4</sup>USDA - ARS, Peoria, IL

- D5 Seasonal variation of macroinvertebrates in streams affected by acid mine drainage.**  
**Andrew Travers** ([at471413@ohio.edu](mailto:at471413@ohio.edu)) and Kelly Johnson, Ohio Univ., Athens, OH
- D6 Evaluating monarch flight with a transmitter prototype.**  
**Chloe Weingarten** ([weingartenchloe@gmail.com](mailto:weingartenchloe@gmail.com))<sup>1</sup>, Kelsey E. Fisher<sup>2</sup>, Erin Hodgson<sup>2</sup> and Steven Bradbury<sup>2</sup>, <sup>1</sup>Friedell Middle School, Rochester, MN, <sup>2</sup>Iowa State Univ., Ames, IA
- D7 Impact of pollinators on *Brassica carinata* yields in South Dakota.**  
**Madeline St. Claire** ([madeline.stclaire@jacks.sdstate.edu](mailto:madeline.stclaire@jacks.sdstate.edu)), Philip Rozeboom and Adam Varenhorst, South Dakota State Univ., Brookings, SD
- D8 The influence of transect layout, height, and bowl color on pollinator sampling in power line ROW in central New York.**  
**Shianne Lindsay** ([shiannelindsay@gmail.com](mailto:shiannelindsay@gmail.com)), SUNY-ESF, Syracuse, NY
- D9 *Phormia regina* (Diptera: Calliphoridae) genetic diversity across the United States.**  
**Kyle Turner** ([keturner123@gmail.com](mailto:keturner123@gmail.com)), Anne Andere and Christine Picard, Indiana Univ.-Purdue Univ., Indianapolis, IN

### M.S. Student Poster Competition / 8:00 AM-5:00 PM

#### Regency South Foyer (Hyatt Regency Cincinnati)

- D11 Molecular Evolution of *Lucilia cuprina* (Diptera: Calliphoridae).**  
**Laura Doll** ([ldoll@iupui.edu](mailto:ldoll@iupui.edu)), Charity Owings and Christine Picard, Indiana Univ.-Purdue Univ., Indianapolis, IN
- D12 Effects of watermelon pest management practices on pest predation.**  
**Ivan Grijalva** ([igrijalv@purdue.edu](mailto:igrijalv@purdue.edu)), Amanda Skidmore, Rick Foster and Steve Yaninek, Purdue Univ., West Lafayette, IN
- D13 An oasis in the desert: Evaluating contour buffer and filter strips within agricultural fields as habitat for native bees in Iowa.**  
**Morgan Mackert** ([mmackert@iastate.edu](mailto:mmackert@iastate.edu)) and Mary Harris, Iowa State Univ., Ames, IA
- D14 Potential insect vectors of grapevine red blotch virus in Missouri.**  
**Harper Smith** ([hfs5h4@mail.missouri.edu](mailto:hfs5h4@mail.missouri.edu)), Dean Vollenberg and Debbie Finke, Univ. of Missouri, Columbia, MO

- D15 Alien tree's sugary SOS exploited by thieving tramp ant: Unidirectional benefit in a tritrophic mélange.**  
*Emily Jones* (jonese18@udayton.edu) and *Chelse Prather*, Univ. of Dayton, Dayton, OH
- D16 Measuring honey bee utilization of CRP pollinator plantings using DNA metabarcoding.**  
*Harper McMinn-Sauder* (mcminn.9@osu.edu)<sup>1</sup>, *Rodney Richardson*<sup>1</sup>, *Mike Smith*<sup>2</sup> and *Reed Johnson*<sup>3</sup>, <sup>1</sup>The Ohio State Univ., Columbus, OH, <sup>2</sup>Conservation Technology Information Center, West Lafayette, IN, <sup>3</sup>The Ohio State Univ., Wooster, OH
- D17 Evaluating the impact of cover crop species and termination date on arthropod activity in a corn production system.**  
*Julia Campos* (julia.nog.campos@gmail.com), *Robert Wright* and *Justin McMechan*, Univ. of Nebraska, Lincoln, NE
- D18 Exploring the effects of old brood comb on larval honey bee (*Apis mellifera* L.) survival.**  
*Stephanie Murray* (murray.968@osu.edu) and *Reed Johnson*, The Ohio State Univ., Wooster, OH
- D19 Determination of ozone's potential as an insecticide and other deleterious effects on spotted wing drosophila, *Drosophila suzukii* (Matsumura) (Diptera: Drosophilidae).**  
*Benjamin Savage* (savagebe@msu.edu) and *Matthew Grieshop*, Michigan State Univ., East Lansing, MI
- D20 Management of *Dectes texanus* in soybeans in western Kentucky.**  
*Izabela Gomes* (izabela.gomes@uky.edu)<sup>1</sup> and *Raul T. Villanueva*<sup>2</sup>, <sup>1</sup>Univ. of Kentucky, Lexington, KY, <sup>2</sup>Univ. of Kentucky, Princeton, KY
- D21 Efficiency of foliar insecticides on soybean aphid populations in South Dakota.**  
*Cole Dierks* (cole.dierks@sdstate.edu), *Brady Hauswedell*, *Philip Rozeboom* and *Adam Varenhorst*, South Dakota State Univ., Brookings, SD
- D22 A new soybean pest in South Dakota: Soybean gall midge.**  
*Jakob Hicks* (jakob.hicks@sdstate.edu), *Philip Rozeboom*, *Cole Dierks* and *Adam Varenhorst*, South Dakota State Univ., Brookings, SD

## Ph.D. Student Poster Competition / 8:00 AM-5:00 PM

### Regency South Foyer (Hyatt Regency Cincinnati)

- D23 Role of host lipids in plant resistance to aphids.**  
*Kaitlin Chapman* (karmitchapman@gmail.com) and *Joe Louis*, Univ. of Nebraska, Lincoln, NE
- D24 Gene silencing in soybean aphid by nebulizing nanoparticle-bound small interference RNA.**  
*Carlos Esquivel* (esquivelpalma.1@buckeyemail.osu.edu)<sup>1</sup>, *Michelle Chang*<sup>2</sup>, *Luis Canas*<sup>1</sup> and *Andrew Michel*<sup>1</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>The College of Wooster, Wooster, OH
- D25 Competition of the stored product insects, *Prostephanus truncatus* (Coleoptera: Bostrichidae) and *Sitophilus zeamais* (Coleoptera: Curculionidae), on maize in different temperatures.**  
*Hannah Quellhorst* (hquellho@ksu.edu)<sup>1</sup>, *Christos Athanassiou*<sup>2</sup> and *William Morrison*<sup>3</sup>, <sup>1</sup>Kansas State Univ., Manhattan, KS, <sup>2</sup>Univ. of Thessaly, Nea Ionia, Greece, <sup>3</sup>USDA - ARS, Manhattan, KS
- D26 Influence of habitat on monarch butterflies (*Danaus plexippus*), their competitors, and natural enemies.**  
*Katie LaPlante* (kmlaplante@mail.missouri.edu) and *Debbie Finke*, Univ. of Missouri, Columbia, MO
- D27 Brown marmorated stink bug feeding impact on industrial hemp yield and quality.**  
*Kadie Britt* (kadiesb@vt.edu), *Mika Pagani* and *Thomas Kuhar*, Virginia Polytechnic Institute and State Univ., Blacksburg, VA
- D28 Optimizing trap capture for *Drosophila suzukii* in elderberry.**  
*Grant Bolton* (lgbcm4@mail.missouri.edu) and *Bruce Barrett*, Univ. of Missouri, Columbia, MO

## MONDAY, MARCH 18, 2019, MORNING

### B.S. Student Ten-Minute Paper Competition

#### Bluegrass A (Hyatt Regency Cincinnati)

**Moderator:** Jessica Kansman, Univ. of Missouri, Columbia, MO

- 8:00 AM 13** Investigating frass preference among bed bugs (*Cimex lectularius* L.) based on different populations and animal blood sources.  
**Alden Siperstein** (siperstein.1@osu.edu) and Susan C. Jones, The Ohio State Univ., Columbus, OH
- 8:12 AM 14** Bed bug harborage orientation preferences.  
**Matthew Volkman** (volkman.6@osu.edu) and Susan C. Jones, The Ohio State Univ., Columbus, OH
- 8:24 AM 15** Comparative efficacy of *Bacillus thuringiensis* var. *israelensis* and entomopathogenic nematodes for controlling fungus gnats (Diptera: Sciaridae) infesting oyster mushrooms.  
**Valerie Anderson** (valeriema2101@gmail.com)<sup>1</sup>, Christopher Ranger<sup>2</sup> and Luis Canas<sup>1</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>USDA - ARS, Wooster, OH
- 8:36 AM 16** Olfactory associative learning in *Drosophila suzukii*.  
**Megan Andrews** (andre278@msu.edu), Juan Huang, Keith Kootner and Matthew Grieshop, Michigan State Univ., East Lansing, MI
- 8:48 AM 17** Does fluoropolymer preparation effect capture of longhorn beetles in panel intercept traps?  
**Kelsey Tobin** (Tobink1@xavier.edu), Emily Franzen, Erica Geers, Samantha Estes, Ann Ray and Clayton Traylor, Xavier Univ., Cincinnati, OH
- 9:00 AM 18** Effects on native cerambycid diversity after large scale disturbance and implications for further invasion.  
**Clayton Traylor** (traylorc@xavier.edu), Emily Franzen and Ann Ray, Xavier Univ., Cincinnati, OH
- 9:12 AM 19** Body size of ground beetles (Coleoptera: Carabidae) decreases with urbanization.  
**Ellen Dunkle** (dunkle.112@buckeyemail.osu.edu), Kayla I. Perry and Mary Gardiner, The Ohio State Univ., Columbus, OH
- 9:24 AM 20** The secret life of honeybee grooming.  
**Alisha Helm** (ahelm1@central.ces.edu)<sup>1</sup>, Shudong Luo<sup>2</sup> and Hongmei Li-Byarlay<sup>1</sup>, <sup>1</sup>Central State Univ., Wilberforce, OH, <sup>2</sup>Chinese Academy of Agricultural Sciences, Beijing, China

### M.S. Student Ten-Minute Paper Competition (MUVE, PBT, SysEB Session)

#### Bluegrass B (Hyatt Regency Cincinnati)

**Moderator:** Sarah Short, The Ohio State Univ., Columbus, OH

- 8:00 AM 21** The relationship between insecticide resistance and the gut microbiome of *Blattella germanica*.  
**Zachery Wolfe** (wolfez@purdue.edu) and Michael Scharf, Purdue Univ., West Lafayette, IN
- 8:12 AM 22** Three alternative fumigants to control *Lasioderma serricorne* (Fabricius) (Coleoptera: Anobiidae) and *Tyrophagus putrescentiae* (Schränk) (Acari: Acaridae) in stored products.  
**Jacqueline Maille** (jmaille@ksu.edu)<sup>1</sup>, Gomaa Ramadan<sup>1</sup>, Peter Edde<sup>2</sup>, M. Wes Schilling<sup>3</sup> and Thomas Phillips<sup>1</sup>, <sup>1</sup>Kansas State Univ., Manhattan, KS, <sup>2</sup>Altria Client Services, Inc., Richmond, VA, <sup>3</sup>Mississippi State Univ., Mississippi State, MS
- 8:36 AM 24** Evaluating gustatory receptor genes through parental RNAi as potential targets for western corn rootworm management.  
**Mariana Sanchez** (mariana.sanchez@huskers.unl.edu)<sup>1</sup>, Arnubio Valencia<sup>2</sup>, Joe Louis<sup>1</sup>, Blair Siegfried<sup>3</sup> and Ana Velez<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Universidad de Caldas, Manizales, Colombia, <sup>3</sup>Univ. of Florida, Gainesville, FL
- 8:48 AM 25** Characterizing exosomes derived from a *Diabrotica* cell line.  
**Kyah Featherston** (kyahf@ksu.edu), Yoonseong Park, Kun Yan Zhu and Kristopher Silver, Kansas State Univ., Manhattan, KS
- 9:00 AM 26** What pollinators are visiting sunflowers in South Dakota?  
**Mackenzie Mattern** (mackenzie.mattern@sdstate.edu), Adam Varenhorst and Philip Rozeboom, South Dakota State Univ., Brookings, SD
- 9:12 AM 27** Geometric morphometric analysis of bilateral asymmetry in mouth hooks of 3rd instar blow fly (Diptera: Calliphoridae) and flesh fly (Diptera: Sarcophagidae) larvae.  
**Gregory Nigoghosian** (gnigogho@purdue.edu) and Trevor Stamper, Purdue Univ., West Lafayette, IN
- 9:24 AM 28** Scale and setae ultrastructure in *Archaeognatha* and *Zygentoma*.  
**Samuel DeGrey** (degrey@wisc.edu)<sup>1</sup> and Steve Davis<sup>2</sup>, <sup>1</sup>Univ. of Wisconsin, Madison, WI, <sup>2</sup>American Museum of Natural History, New York, NY

## M.S. Student Ten-Minute Paper Competition (P-IE Session I)

### Buckeye A (Hyatt Regency Cincinnati)

**Moderator:** George Heimpel, Univ. of Minnesota, St. Paul, MN

- 8:00 AM 29** **Effect of age and sex on adult western corn rootworm (*Diabrotica virgifera virgifera*) susceptibility to DvSnf7 dsRNA.**  
**Matthew Welter** (mjwelter@huskers.unl.edu)<sup>1</sup>, Lance Meinke<sup>1</sup>, William Moar<sup>2</sup>, Chitvan Khajuria<sup>2</sup> and Ana Velez<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Monsanto Company, St. Louis, MO
- 8:12 AM 30** **Bees in the city: How heavy metals effect *Bombus impatiens* health and fecundity.**  
**Sarah Scott** (scott.2094@osu.edu), Mary Gardiner and Frances S. Sivakoff, The Ohio State Univ., Columbus, OH
- 8:24 AM 31** **Determining the effects of ground management practices on the hoary squash bee, *Peponapis pruinosa*, using a citizen science survey.**  
**Logan Appenfeller** (appenfel@msu.edu) and Zsolia Szendrei, Michigan State Univ., East Lansing, MI
- 8:36 AM 32** **If you build it, they will come: Implementing bare soil nesting areas provides habitat for many ground-nesting bee species.**  
**Morgan Mackert** (mmackert@iastate.edu) and Mary Harris, Iowa State Univ., Ames, IA
- 8:48 AM 33** **Don't drink the guttation water! Impacts of fungicide residue within turfgrass guttation fluid on *Apis mellifera*.**  
**Audrey Simard** (asimard@wisc.edu), Univ. of Wisconsin, Madison, WI
- 9:00 AM 34** **The importance of surface mining as a landscape variable in shaping bee communities of Central Appalachian forests.**  
**Amanda Dunaway** (amanda\_dunaway4@mymail.eku.edu)<sup>1</sup> and Valerie Peters<sup>2</sup>, <sup>1</sup>Univ. of Kentucky, Lexington, KY, <sup>2</sup>Miami Univ., Oxford, OH
- 9:12 AM 35** **Does management frequency drive the conservation value of vacant land for ant communities?**  
**Alex Tyrpak** (tyrpak.3@buckeyemail.osu.edu), Kayla I. Perry, Yvan Delgado de la Flor, Joe Raczkowski and Mary Gardiner, The Ohio State Univ., Columbus, OH

- 9:24 AM 36** **Monarch larvae (*Danaus plexippus*) engage in cannibalism when food from their host plant (*Asclepias* spp.) is not available.**  
**Nancy Shryock** (nshryock@iastate.edu), Iowa State Univ., Ames, IA
- 9:36 AM 37** **Do small patches of prairie conserve pollinators, including Monarchs (*Danaus plexippus* [Lepidoptera: Nymphalidae]) in an agricultural setting?**  
**Caroline Murray** (cjmurray@iastate.edu), Lisa Shulte Moore, Ge Zhang, John Tyndall and Matthew O'Neal, Iowa State Univ., Ames, IA
- 9:48 AM 38** **Landscape ecology of the wheat stem sawfly and its natural enemies in Nebraska.**  
**Bethany Bergstrom** (bbergstrom4@unl.edu)<sup>1</sup>, Gary Hein<sup>1</sup> and Jeffery Bradshaw<sup>2</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Univ. of Nebraska, Scottsbluff, NE

## M.S. Student Ten-Minute Paper Competition (P-IE Session II)

### Bluegrass B (Hyatt Regency Cincinnati)

**Moderator:** Sajjan Grover, Univ. of Nebraska, Lincoln, NE

- 10:00 AM 39** **Detecting sugarcane aphid (*Melanaphis sacchari*) infestation in grain sorghum (*Sorghum bicolor*) using leaf spectral response.**  
**Grace Craigie** (craigieg@ksu.edu) and Brian McCornack, Kansas State Univ., Manhattan, KS
- 10:12 AM 40** **Aphids on the move: How multi-trophic interactions affect host-plant quality and selection for *Aphis asclepiadis*.**  
**Maria Mullins** (mmullins@uccs.edu)<sup>1</sup>, James Den Uyl<sup>1</sup>, Samantha Trail<sup>2</sup>, Benjamin Davidson<sup>3</sup> and Emily Mooney<sup>1</sup>, <sup>1</sup>Univ. of Colorado, Colorado Springs, CO, <sup>2</sup>Pikes Peak School of Expeditionary Learning, Peyton, CO, <sup>3</sup>Vassar College, Poughkeepsie, NY
- 10:24 AM 41** **Effect of crop rotation on soybean aphid.**  
**Erika Rodbell** (erodbell@iastate.edu), Erin Hodgson, Matthew Liebman and Matthew O'Neal, Iowa State Univ., Ames, IA
- 10:36 AM 42** **Optimizing profit for farmers managing soybean aphid.**  
**Ashley Dean** (adean@iastate.edu), John Tyndall, Erin Hodgson and Matthew O'Neal, Iowa State Univ., Ames, IA



- 10:48 AM 43** **Dispersal of wheat curl mite (*Aceria tosichella* Keifer) population densities in a wheat field.**  
*Lindsay Overmyer* (overmyerlindsay@gmail.com) and Gary Hein, Univ. of Nebraska, Lincoln, NE
- 11:00 AM 44** **Identification of aster yellows vectors in Michigan celery and carrot fields.**  
*Patrick Stillson* (stillson@msu.edu) and Zsolt Szendrei, Michigan State Univ., East Lansing, MI
- 11:12 AM 45** **The very hungry caterpillars: Influences of tillage and rotation on plant-insect interactions.**  
*Emily Althoff* (e.althoff95@gmail.com) and Kevin Rice, Univ. of Missouri, Columbia, MO
- 11:24 AM 46** **Management of the brown marmorated stink bug, *Halyomorpha halys*, using a polyculture trap crop for peppers.**  
*Lauren Fann* (lefa228@uky.edu)<sup>1</sup> and Ric Bessin<sup>2</sup>, <sup>1</sup>Univ. of Kentucky, Lexington, KY, <sup>2</sup>Univ. of Kentucky, Princeton, KY
- 11:36 AM 47** **Development of a molecular tool for billbug larval identification using DNA barcodes.**  
*Marian Rodriguez-Soto* (rodri561@purdue.edu)<sup>1</sup>, Laramy Enders<sup>1</sup>, Linda Mason<sup>1</sup>, Ricardo Ramirez<sup>2</sup>, Xi Xiong<sup>3</sup>, Kai Umeda<sup>4</sup> and Douglas Richmond<sup>1</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>Utah State Univ., Logan, UT, <sup>3</sup>Univ. of Missouri, Columbia, MO, <sup>4</sup>Univ. of Arizona, Phoenix, AZ
- 11:48 AM 48** **Can nanoparticles improve RNA interference in the fall armyworm, *Spodoptera frugiperda*?**  
*Ana Trabanino* (trabaninopino.1@buckeyemail.osu.edu), Yosra Helmy, Gireesh Rajashekara and Andrew Michel, The Ohio State Univ., Wooster, OH

## Ph.D. Student Ten-Minute Paper Competition (MUVE, PBT, SysEB Session)

### Bluegrass A (Hyatt Regency Cincinnati)

**Moderator:** Joel R. Coats, Iowa State Univ., Ames, IA

- 10:00 AM 49** **Evaluating biorational products as mosquito repellents using an improved spatial repellency assay.**  
*Caleb Corona* (clcorona@iastate.edu), James Klimavicz and Joel R. Coats, Iowa State Univ., Ames, IA
- 10:12 AM 50** **Effects of nectar phytochemicals on life-history traits of the invasive Asian tiger mosquito, *Aedes albopictus*.**  
*Teresia Njoroge* (tnjorog2@illinois.edu), May Berenbaum and Chris Stone, Univ. of Illinois, Champaign, IL
- 10:24 AM 51** **The microbiota of *Aedes triseriatus* and *Aedes japonicus* larvae (Diptera: Culicidae) cluster by species and the larval environment.**  
*Elijah Juma* (juma2@illinois.edu)<sup>1</sup>, Brian F. Allan<sup>2</sup> and Ephraim Muturi<sup>3</sup>, <sup>1</sup>Univ. of Illinois, Urbana, IL, <sup>2</sup>Univ. of Illinois, Champaign, IL, <sup>3</sup>USDA - ARS, Peoria, IL
- 10:36 AM 52** **Stable isotope analysis reveals larval diet of the adult black blow fly *Phormia regina* Meigen (Diptera: Calliphoridae).**  
*Charity Owings* (charityowings@gmail.com), William Gilhooly III and Christine Picard, Indiana Univ.-Purdue Univ., Indianapolis, IN
- 10:48 AM 53** **Monitoring of soybean aphid resistance to lambda-cyhalothrin and identification of mutation in the sodium channel gene associated with insecticide resistance.**  
*Ivair Valmorbida* (ivairval@iastate.edu)<sup>1</sup>, Jessica Hohenstein<sup>1</sup>, Brad Coates<sup>2</sup>, Erin Hodgson<sup>1</sup>, Joel R. Coats<sup>1</sup> and Matthew O'Neal<sup>1</sup>, <sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>USDA - ARS, Ames, IA
- 11:00 AM 54** **Evaluation monoterpenoids and their parent oils for ability to repel ticks.**  
*Colin Wong* (cwong1@iastate.edu), Kylie Crystal, Jacob Johnson and Joel R. Coats, Iowa State Univ., Ames, IA
- 11:12 AM 55** **Form(s) from above and below: Tawny crazy ant (*Nylanderia fulva*) trophic ecology and effect on prairie food webs.**  
*Ryan Reihart* (reihart1@udayton.edu), Univ. of Dayton, Dayton, OH
- 11:24 AM 56** **Species composition and abundance of stink bugs (Hemiptera: Heteroptera: Pentatomidae) in Nebraska.**  
*Blessing Ademokoya* (bademokoya@huskers.unl.edu)<sup>1</sup>, Thomas Hunt<sup>2</sup> and Robert Wright<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Univ. of Nebraska, Concord, NE

## Ph.D. Student Ten-Minute Paper Competition (P-IE Session I)

### Buckeye A (Hyatt Regency Cincinnati)

**Moderator:** Shravan Sukumar, Dow AgroSciences, Indianapolis, IN

- |                           |  |                           |  |
|---------------------------|--|---------------------------|--|
| <p><b>10:00 AM 57</b></p> | <p><b>Spatio-temporal dynamics of the Asiatic garden beetle, <i>Maladera castanea</i> (Coleoptera: Scarabaeidae), in agroecosystems.</b><br/> <b>Adrian Pekarcik</b> (<a href="mailto:pekarcik.4@osu.edu">pekarcik.4@osu.edu</a>)<sup>1</sup>, Chris DiFonzo<sup>2</sup>, Amy Raudenbush<sup>1</sup> and Kelley Tilmon<sup>1</sup>,<br/> <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>Michigan State Univ., East Lansing, MI</p> | <p><b>10:36 AM 60</b></p> | <p><b>Performance of emerald ash borer (<i>Agrilus planipennis</i>) in stressed non-ash hosts.</b><br/> <b>Donnie L. Peterson</b> (<a href="mailto:peterston.143@wright.edu">peterston.143@wright.edu</a>) and Don Cipollini, Wright State Univ., Dayton, OH</p>   |
| <p><b>10:12 AM 58</b></p> | <p><b>Estimates of common milkweed (<i>Asclepias syriaca</i>) utilization by monarch (<i>Danaus plexippus</i>) caterpillars.</b><br/> <b>Kelsey E. Fisher</b> (<a href="mailto:kefisher@iastate.edu">kefisher@iastate.edu</a>) and Steven Bradbury, Iowa State Univ., Ames, IA</p>   | <p><b>10:48 AM 61</b></p> | <p><b>Does tree species origin explain patterns of herbivory in an inner-city urban forest?</b><br/> <b>Christopher Riley</b> (<a href="mailto:riley.595@osu.edu">riley.595@osu.edu</a>) and Mary Gardiner, The Ohio State Univ., Columbus, OH</p>   |
| <p><b>10:24 AM 59</b></p> | <p><b>Low host densities adversely affect lifespan and fecundity of <i>Aphelinus certus</i> (Hym.: Aphelinidae), a resident natural enemy of soybean aphid.</b><br/> <b>James Miksanek</b> (<a href="mailto:miks0007@umn.edu">miks0007@umn.edu</a>) and George Heimpel, Univ. of Minnesota, St. Paul, MN</p>   | <p><b>11:00 AM 62</b></p> | <p><b>Effects of milkweed (<i>Asclepias</i> spp.) chemical profiles on oleander aphid (<i>Aphis nerii</i>) and monarch butterfly (<i>Danaus plexippus</i>) microbial symbionts.</b><br/> <b>Thorsten Hansen</b> (<a href="mailto:hanse125@purdue.edu">hanse125@purdue.edu</a>), John Couture and Laramy Enders, Purdue Univ., West Lafayette, IN</p>                   |
|                           |  | <p><b>11:12 AM 63</b></p> | <p><b>What smells right: Applying metabolomic strategies to understand and exploit host selection in <i>Lygus hesperus</i>.</b><br/> <b>Matthew Hetherington</b> (<a href="mailto:mhetherington@wisc.edu">mhetherington@wisc.edu</a>)<sup>1</sup> and Johanne Brunet<sup>2</sup>, <sup>1</sup>Univ. of Wisconsin, Madison, WI, <sup>2</sup>USDA - ARS, Madison, WI</p> |
|                           |  | <p><b>11:24 AM 64</b></p> | <p><b>Characterizing the volatile cues used by the carrot weevil in host location.</b><br/> <b>Emily Justus</b> (<a href="mailto:justus.67@osu.edu">justus.67@osu.edu</a>) and Elizabeth Long, The Ohio State Univ., Wooster, OH</p>   |

# MONDAY, MARCH 18, 2019, AFTERNOON

## Entomological Research and Technological Innovation

### Bluegrass B (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Amanda Skidmore, Univ. of Kentucky, Lexington, KY and Christopher Riley, The Ohio State Univ., Columbus, OH

- 1:30 PM Welcoming Remarks**
- 1:35 PM 65 Applying molecular approaches to study insect microbiomes: More than just adding “meta” to your “omics”.**  
**Laramy Enders** ([laramy.enders@purdue.edu](mailto:laramy.enders@purdue.edu)), Thorsten Hansen, Colleen Couch and Marian Rodriguez-Soto, Purdue Univ., West Lafayette, IN
- 1:55 PM 66 RNAi-based pest management: Opportunities and challenges.**  
**Subba Reddy Palli** ([rpalli@uky.edu](mailto:rpalli@uky.edu)), Univ. of Kentucky, Lexington, KY
- 2:15 PM 67 Utilizing spectroscopy to manage food security.**  
**Raquel Peron** ([rperon@purdue.edu](mailto:rperon@purdue.edu)) and John Couture, Purdue Univ., West Lafayette, IN
- 2:35 PM 68 RFID technology and other tools to track the behavior of insects.**  
**Sebastian Shepherd** ([shephe24@purdue.edu](mailto:shephe24@purdue.edu)), Purdue Univ., West Lafayette, IN
- 2:55 PM 69 Monarch butterfly movement ecology: Adapting automated radio telemetry to track monarch butterflies.**  
**Kelsey E. Fisher** ([kefisher@iastate.edu](mailto:kefisher@iastate.edu)), Iowa State Univ., Ames, IA
- 3:15 PM Break**
- 3:35 PM 70 Blue Dasher Farm: A new approach for independent science.**  
**Jonathan Lundgren** ([jgl.entomology@gmail.com](mailto:jgl.entomology@gmail.com)), Blue Dasher Farm, Estelline, SD
- 3:55 PM 71 Laser ablation tomography: Vaporizing insects with 1 million watts to quantify fitness.**  
**Kevin Rice** ([RiceKev@missouri.edu](mailto:RiceKev@missouri.edu))<sup>1</sup>, Asheesh Landa<sup>2</sup> and Benjamin Hall<sup>2</sup>, <sup>1</sup>Univ. of Missouri, Columbia, MO, <sup>2</sup>Lasers for Innovative Solutions, State College, PA
- 4:15 PM 72 Wait, you can do what with a drone?**  
**Brian McCornack** ([bmccornack@gmail.com](mailto:bmccornack@gmail.com)), Kansas State Univ., Manhattan, KS

- 4:35 PM 73 3D printing as a tool for integrating biology and technology classes.**  
**Jakob Goldner** ([jgoldner@mix.wvu.edu](mailto:jgoldner@mix.wvu.edu)), Purdue Univ., West Lafayette, IN

- 4:55 PM 74 Highly efficient imaging techniques, workflows and technologies for digitizing modern science.**  
**Mark Smith** ([mark@macroscopicsolutions.com](mailto:mark@macroscopicsolutions.com)), Macroscopic Solutions, Chicago, IL

### 5:15 PM Concluding Remarks

## Linking Genes to Behavior: Expanding the Targets for Behaviorally-Based Management of Insects

### Buckeye A (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Erin Scully, USDA - ARS, Manhattan, KS and Rob Morrison, USDA - ARS, Manhattan, KS

- 1:30 PM 75 Tick SUCKS!: Water balance and thermoregulation.**  
**Paulina Ruiz** ([lpaldonado@ksu.edu](mailto:lpaldonado@ksu.edu)), Soheila Abdoijabbar and Yoonseong Park, Kansas State Univ., Manhattan, KS
- 1:50 PM 76 Insights from genomes, transcriptomes and proteomes for insect manipulations.**  
**Zainulabeuddin Syed** ([zainulabeuddin.syed@uky.edu](mailto:zainulabeuddin.syed@uky.edu)), Univ. of Kentucky, Lexington, KY
- 2:10 PM 77 Survival of natural and artificial stress through molecular, physiological, and behavioral mechanisms in ixodid ticks.**  
**Andrew Rosendale** ([rosendaw@ucmail.uc.edu](mailto:rosendaw@ucmail.uc.edu)) and Joshua Benoit, Univ. of Cincinnati, Cincinnati, OH
- 2:30 PM 78 The influence of genetic and environmental variation on attraction behavior in red flour beetles.**  
**Alison Gerken** ([alison.gerken@ars.usda.gov](mailto:alison.gerken@ars.usda.gov))<sup>1</sup>, Valerie Nguyen<sup>2</sup>, Shelby Abts<sup>1</sup>, Erin Scully<sup>1</sup> and James Campbell<sup>1</sup>, <sup>1</sup>USDA - ARS, Manhattan, KS, <sup>2</sup>Kansas State Univ., Manhattan, KS
- 2:50 PM 79 Exploring chemoreceptors as potential targets for western corn rootworm.**  
**Ana Velez** ([avelezarango2@unl.edu](mailto:avelezarango2@unl.edu)), Mariana Sanchez and Joe Louis, Univ. of Nebraska, Lincoln, NE
- 3:10 PM 80 Dehydration of mosquitoes alters carbohydrate metabolism to increase blood feeding propensity and likely drives gene alterations to increase blood meal retention.**  
**Christopher Holmes** ([holmescp@mail.uc.edu](mailto:holmescp@mail.uc.edu)), Elise Didion, Emily C. Jennings, Gabriela Nine, Andrew Rosendale and Joshua Benoit, Univ. of Cincinnati, Cincinnati, OH

## The Mutual Benefits of Connecting Scientists to Teachers and Schools

### Bluegrass A (Hyatt Regency Cincinnati)

**Moderator and Organizer:** Samantha Trail, Univ. of Colorado, Colorado Springs, CO

- 1:30 PM 81** Collaborations with teachers can benefit your research program.  
**Emily Mooney** (emooney@uccs.edu), Univ. of Colorado, Colorado Springs, CO
- 2:00 PM 82** Citizen science facilitates curricular connections that expose students to the collegial process of genuine science.  
**Margaret Gaddis** (mgaddis@uccs.edu), Univ. of Colorado, Colorado Springs, CO
- 2:30 PM 83** Assigning and applying sketches to develop student skills in reasoning and problem solving.  
**Paul Heideman** (pdheid@wm.edu), College of William & Mary, Williamsburg, VA
- 3:00 PM 84** Authentic fieldwork experiences for both teachers and students can benefit the classroom.  
**Samantha Trail** (setrail@email.wm.edu), Miami Univ., Oxford, OH; Pikes Peak School of Expeditionary Learning, Peyton, CO; Univ. of Colorado, Colorado Springs, CO

## M.S. Student Ten-Minute Paper Competition (P-IE Session III)

### Buckeye B (Hyatt Regency Cincinnati)

**Moderator:** Hannah Penn, Louisiana State Univ., Baton Rouge, LA

- 1:30 PM 85** Life stage-specific differences in mobility of *Trogoderma variabile* (Coleoptera: Dermestidae) after exposure to long-lasting insecticide netting.  
**Rachel Wilkins** (rachwilk15@gmail.com)<sup>1</sup> and Rob Morrison<sup>2</sup>, <sup>1</sup>Kansas State Univ., Manhattan, KS, <sup>2</sup>USDA - ARS, Manhattan, KS
- 1:42 PM 86** A bee-line away from foliar insecticides for the Japanese beetle (Coleoptera: Scarabaeidae)..  
**Kelsey Benthall** (kjbhnd@mail.missouri.edu) and Kevin Rice, Univ. of Missouri, Columbia, MO
- 1:54 PM 87** How does urbanization affect declining native lady beetle species?  
**Denisha Parker** (parker.1052@osu.edu) and Mary Gardiner, The Ohio State Univ., Columbus, OH

- 2:06 PM 88** Heat waves have adverse effects on Colorado potato beetle (*Leptinotarsa decemlineata*) and potato (*Solanum tuberosum*).  
**Joshua Snook** (snookjo2@msu.edu), Zsofia Szendrei and William Wetzel, Michigan State Univ., East Lansing, MI
- 2:18 PM 89** A novel use of protein immunomarking in studying the dispersal of woodboring beetles.  
**Scott Gula** (sgula@purdue.edu)<sup>1</sup>, Vanessa Lopez<sup>2</sup>, Ann Ray<sup>3</sup>, Scott Machtley<sup>4</sup>, James Hagler<sup>4</sup> and Matthew Ginzel<sup>1</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>USDA - Forest Service, Fort Collins, CO, <sup>3</sup>Xavier Univ., Cincinnati, OH, <sup>4</sup>USDA - ARS, Maricopa, AZ
- 2:30 PM 90** Evaluating the impact of cover crop management tactics on arthropod activity.  
**Gabriela Inveninato Carmona** (gabiinveninato@gmail.com) and Anthony McMechan, Univ. of Nebraska, Lincoln, NE
- 2:42 PM 91** Crop defense diversity influences the predator-prey interaction between an insect pest and a biocontrol predator.  
**Kayleigh Hauri** (haurikay@msu.edu) and William Wetzel, Michigan State Univ., East Lansing, MI
- 2:54 PM 92** Using native biological control bacteria and fungi for the management of an insect pest and fungal pathogens in stored grain.  
**Gülçin Ercan** (glcn.ercan@gmail.com)<sup>1</sup>, Anthony Adesemoye<sup>2</sup> and Julie Peterson<sup>2</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Univ. of Nebraska, North Platte, NE
- 3:06 PM 93** Impact of tree biodiversity on insect-mediated canopy processes.  
**Taylor Nelson** (tmnelson@purdue.edu)<sup>1</sup>, Lorenzo Cotrozzi<sup>2</sup>, Gordon McNickle<sup>1</sup>, Brady Hardiman<sup>1</sup>, Douglas Jacobs<sup>1</sup> and John Couture<sup>1</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>Università di Pisa, Pisa, Italy
- 3:18 PM 94** Hop and a sweep: Grasshopper abundance and diversity in eastern South Dakota.  
**Erica Anderson** (erica.anderson@sdstate.edu)<sup>1</sup>, Adam Varenhorst<sup>1</sup>, Philip Rozeboom<sup>1</sup>, Patrick Wagner<sup>2</sup>, Amanda Bachmann<sup>3</sup>, Michael Rentz<sup>4</sup> and Billy Fuller<sup>1</sup>, <sup>1</sup>South Dakota State Univ., Brookings, SD, <sup>2</sup>South Dakota State Univ., Rapid City, SD, <sup>3</sup>South Dakota State Univ., Pierre, SD, <sup>4</sup>Iowa State Univ., Ames, IA



## Ph.D. Student Ten-Minute Paper Competition (P-IE Session II)

### Bluegrass A (Hyatt Regency Cincinnati)

Moderator: Ana Vélez, Univ. of Nebraska-Lincoln, Lincoln, NE

- 3:30 PM 95** **Natural variation in sorghum resistance to greenbugs, *Schizaphis graminum* (Rondani).**  
**Sajjan Grover** (sajjan.grover@huskers.unl.edu)<sup>1</sup>, Braden Wojahn<sup>2</sup>, Suresh Varsani<sup>1</sup>, Scott E. Sattler<sup>3</sup> and Joe Louis<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Univ. of Nebraska, Lincoln, NE, <sup>3</sup>USDA - ARS, Lincoln, NE
- 3:42 PM 96** **Sustainable landscape enhancements to reduce pesticide exposure in agricultural landscapes.**  
**Surabhi Vakil** (guptasurbhi8a@gmail.com)<sup>1</sup>, Ana Velez<sup>1</sup>, Arnubio Valencia<sup>2</sup> and Judy Wu-Smart<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Universidad de Caldas, Manizales, Colombia
- 3:54 PM 97** **Managing Japanese beetle (*Popillia japonica*) in fruit crops: Varietal preference in Minnesota raspberries and wine grapes.**  
**Dominique Ebbenga** (ebbe0031@umn.edu), Eric C. Burkness, Matthew Clark and William D. Hutchison, Univ. of Minnesota, St. Paul, MN
- 4:06 PM 98** **Effects of SmartStax PRO<sup>®</sup> dietary exposure on male western corn rootworm (Coleoptera: Chrysomelidae) life history traits.**  
**Jordan Reinders** (jordan.reinders3@gmail.com)<sup>1</sup>, William Moar<sup>2</sup>, Paula A. Price<sup>2</sup>, Sean Evans<sup>2</sup>, Graham P. Head<sup>2</sup> and Lance Meinke<sup>1</sup>,

<sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Bayer Crop Science, St. Louis, MO

- 4:18 PM 99** **Efficacy of *Trichogramma ostrinae* for biological control of the western bean cutworm (*Striacosta albicosta*) in Nebraska field corn and dry edible bean.**  
**Jeffrey Cluever** (jcluever2@unl.edu)<sup>1</sup>, Robert Wright<sup>2</sup>, Julie Peterson<sup>3</sup>, Sara Salgado Astudillo<sup>3</sup>, Katharine Swoboda Bhattara<sup>3</sup>, Priscila Colombo Da Luz<sup>3</sup>, Débora Montezano<sup>2</sup> and Jeffrey Bradshaw<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Scottsbluff, NE, <sup>2</sup>Univ. of Nebraska, Lincoln, NE, <sup>3</sup>Univ. of Nebraska, North Platte, NE
- 4:30 PM 100** **Greater than expected injury to Bt-RW traits observed in a Minnesota field population of northern corn rootworm (*Diabrotica barberi*).**  
**Edwin Benkert III** (benke017@umn.edu) and Ken Ostlie, Univ. of Minnesota, St. Paul, MN
- 4:42 PM 101** **Combining crop production and conservation for improved bee health: Impacts on honey bee queen quality?**  
**Ashley St. Clair** (astclair@iastate.edu)<sup>1</sup>, Ge Zhang<sup>1</sup>, David Stein<sup>1</sup>, Adam Dolezal<sup>2</sup>, Harmen P. Hendriksma<sup>1</sup>, Randall Cass<sup>3</sup>, Matthew O'Neal<sup>1</sup> and Amy Toth<sup>1</sup>, <sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>Univ. of Illinois, Champaign, IL, <sup>3</sup>Iowa State Univ. Extension and Outreach, Ames, IA
- 4:54 PM 102** **Landscape connectivity drives effective urban bee conservation.**  
**Katie Turo** (turo.2@osu.edu) and Mary Gardiner, The Ohio State Univ., Columbus, OH

## TUESDAY, MARCH 19, 2019, POSTERS

### Regular Posters / 8:00 AM-5:00 PM

Regency South Foyer (Hyatt Regency Cincinnati)

- D30 Creating urban networks for research.**  
**Caitlin Stamper** (clstam3@uky.edu)<sup>1</sup>, Amanda Skidmore<sup>2</sup>, Christoph Kositzke<sup>1</sup> and Stephen Dobson<sup>1</sup>, <sup>1</sup>Univ. of Kentucky, Lexington, KY, <sup>2</sup>Purdue Univ., West Lafayette, IN
- D31 Lipid composition of *Leptinotarsa decemlineata* and its relationship to insecticide resistance.**  
**Benjamin Sanchez-Sedillo** (sanchezsedil@wisc.edu), Justin Clements, Jake Olson, Benjamin Bradford, Linda Crubaugh and Russell Groves, Univ. of Wisconsin, Madison, WI
- D32 Do interactions between warmer temperatures and acidification impact growth and survival of the aquatic midge *Chironomus riparius*?**  
**Ashlee Widener** (aw653415@ohio.edu) and Kelly Johnson, Ohio Univ., Athens, OH
- D34 Prevalence and population dynamics of tomato leafminer, *Tuta absoluta* (Meyrick), a devastating invasive pest on tomato crop, and its natural enemies at Nile Delta region, Egypt.**  
El-Said Hassan<sup>1</sup>, Ibrahim Mesbah<sup>2</sup>, Fathi Ali<sup>1</sup> and **Ibrahim El-Shesheny** (i.elsesheny@agr.tanta.unl.edu)<sup>2,3</sup>, <sup>1</sup>Plant Protection Research Institute, Agriculture Research Center, Giza, Egypt, <sup>2</sup>Tanta Univ., Tanta, Egypt, <sup>3</sup>Univ. of Nebraska, Lincoln, NE
- D35 Edible insects: Changing western perceptions of taboo food to healthy, eco-friendly diet of the future.**  
**Sujaya Rao** (sujaya@umn.edu), Univ. of Minnesota, St. Paul, MN

- D36 Kentucky farmers' supportiveness of pollinator conservation and cultural control.**  
**Hannah Penn** (hannahjpenn@gmail.com)<sup>1</sup>, Michael Cunningham-Minnick<sup>2</sup>, Jerrod Penn<sup>1</sup> and Wuyang Hu<sup>3</sup>, <sup>1</sup>Louisiana State Univ., Baton Rouge, LA, <sup>2</sup>Miami Univ., Oxford, OH, <sup>3</sup>The Ohio State Univ., Columbus, OH
- D37 Neonics and nematodes: Investigation of pest management practices on entomopathogenic nematodes in Indiana corn and watermelon production systems.**  
Luisa Maria Guevara<sup>1</sup>, **Amanda Skidmore** (amanda.skidmore@gmail.com)<sup>2</sup> and Steve Yaninek<sup>2</sup>, <sup>1</sup>Pontificia Universidad Javeriana, Bogotá, Colombia, <sup>2</sup>Purdue Univ., West Lafayette, IN
- D38 Removal of selection for Cry34/35Ab1 resistance restores susceptibility in resistant population of western corn rootworm *Diabrotica virgifera virgifera* LeConte.**  
**Kyle Paddock** (paddockk@missouri.edu)<sup>1</sup>, Adriano Pereira<sup>1</sup>, Julie Barry<sup>2</sup> and Bruce Hibbard<sup>2</sup>, <sup>1</sup>Univ. of Missouri, Columbia, MO, <sup>2</sup>USDA - ARS, Columbia, MO
- D39 Fatal attraction of a generalist insect herbivore to *Beauveria bassiana*.**  
**Ruchika Geedi** (ruchika.kataria15@gmail.com)<sup>1</sup>, Christopher Ranger<sup>2</sup>, Luis Canas<sup>1</sup> and Michael Reding<sup>2</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>USDA - ARS, Wooster, OH
- D40 Pollinator influence on sunflower yield in South Dakota.**  
**Mackenzie Mattern** (mackenzie.mattern@sdstate.edu), Philip Rozeboom and Adam Varenhorst, South Dakota State Univ., Brookings, SD
- D41 An historical perspective on soybean aphid (*Aphis glycines* Matsumura) in SW Minnesota.**  
**Bruce Potter** (bpotter@umn.edu)<sup>1</sup> and Robert Koch<sup>2</sup>, <sup>1</sup>Univ. of Minnesota, Lambertson, MN, <sup>2</sup>Univ. of Minnesota, St. Paul, MN

**D42 Soybean aphid-infestation levels in relation to cultivar, foliar insecticide, and insecticide seed treatment.**

**Louis Hesler** (louis.hesler@usda.gov), USDA - ARS, Brookings, SD

**D43 Management decisions for rootworms.**

**Clint Pilcher** (clint.pilcher@pioneer.com), Michael Price, Mark Jeschke and Andre Crespo, Corteva Agriscience, Agriculture Division of DowDuPont, Johnston, IA

**D44 Potential pollinator diversity at varying elevations in *Ligusticum porteri*.**

**Samantha Trail** (setrail@email.wm.edu)<sup>1</sup>, James Den Uy<sup>2</sup>, Maria Mullins<sup>2</sup>, Benjamin Davidson<sup>3</sup> and Emily Mooney<sup>2</sup>, <sup>1</sup>Pikes Peak School of Expeditionary Learning, Peyton, CO, <sup>2</sup>Univ. of Colorado, Colorado Springs, CO, <sup>3</sup>Vassar College, Poughkeepsie, NY

**D45 Investigation of a soybean-associated bee community.**

**Michael J. Cunningham-Minnick** (minnickmj@miamioh.edu)<sup>1</sup>, Valerie E. Peters<sup>1,2</sup> and Thomas O. Crist<sup>1</sup>, <sup>1</sup>Miami Univ., Oxford, OH, <sup>2</sup>Eastern Kentucky Univ., Richmond, KY

**D46 Multi-year evaluation of Ampex™ EZ soil insecticide for control of below-ground pests of corn in the US.**

**Ronald Estes** (ron.estes@valent.com)<sup>1</sup>, Carlos Granadino<sup>2</sup>, Trevor Israel<sup>3</sup>, Jonathan Kohrt<sup>4</sup>, Eric Ott<sup>5</sup>, Dawn Refsell<sup>6</sup>, Lowell Sandell<sup>7</sup> and Allison Walston<sup>8</sup>, <sup>1</sup>Valent USA LLC, Tolono, IL, <sup>2</sup>Valent USA LLC, Chesterfield, MO, <sup>3</sup>Valent USA LLC, Sioux Falls, SD, <sup>4</sup>Valent USA LLC, West Des Moines, IA, <sup>5</sup>Valent USA LLC, Greenfield, IN, <sup>6</sup>Valent USA LLC, Lathrop, MO, <sup>7</sup>Valent USA LLC, Ashland, NE, <sup>8</sup>Valent USA, Hood River, OR

**D47 Spotted lanternfly - Regulatory issues in Indiana.**

**Ren Hall** (rhall@dnr.in.gov), Indiana Dept. of Natural Resources, Indianapolis, IN

**D48 Piggybacking through eastern South Dakota: Density and distribution of grasshopper mites.**

**Erica Anderson** (erica.anderson@sdstate.edu)<sup>1</sup>, Adam Varenhorst<sup>1</sup>, Philip Rozeboom<sup>1</sup>, Patrick Wagner<sup>2</sup>, Amanda Bachmann<sup>3</sup>, Michael Rentz<sup>4</sup> and Billy Fuller<sup>1</sup>, <sup>1</sup>South Dakota

State Univ., Brookings, SD, <sup>2</sup>South Dakota State Univ., Rapid City, SD, <sup>3</sup>South Dakota State Univ., Pierre, SD, <sup>4</sup>Iowa State Univ., Ames, IA

**D49 Performance of Monsanto CRW II and CRW III pyramids against *Diabrotica* spp. in prospective Bt-resistance situations in Minnesota.**

**Kenneth Ostlie** (ostli001@umn.edu) and Edwin Benkert III, Univ. of Minnesota, St. Paul, MN

**D50 Comparative effects of cage type on adult corn rootworm (*Diabrotica* spp.) emergence.**

**Brianna Foster** (foste411@umn.edu), Michele Majeski, Edwin Benkert III and Ken Ostlie, Univ. of Minnesota, St. Paul, MN

**D51 Efficacy of insecticide impregnated netting for the management of stink bugs (Hemiptera) on soybean in Kentucky.**

**Yaziri Gonzalez** (yazgonzalez17@uky.edu) and Raul T. Villanueva, Univ. of Kentucky, Princeton, KY

**D52 Are red sunflower seed weevils resistant to pyrethroids in South Dakota?**

**Philip Rozeboom** (philip.rozeboom@sdstate.edu)<sup>1</sup>, Patrick Wagner<sup>2</sup> and Adam Varenhorst<sup>1</sup>, <sup>1</sup>South Dakota State Univ., Brookings, SD, <sup>2</sup>South Dakota State Univ., Rapid City, SD

**D53 Cuban ground crickets (*Neonemobius cubensis*) in the Chicago region.**

**Carl Strang** (wildlifer@aol.com), Independent Researcher, Warrenville, IL

**D54 Influence of white-tailed deer and an invasive shrub on ant communities: A long-term experimental study.**

**Michael Mahon** (mahonmb@miamioh.edu)<sup>1</sup>, Kaitlin Campbell<sup>2</sup> and Thomas O. Crist<sup>1</sup>, <sup>1</sup>Miami Univ., Oxford, OH, <sup>2</sup>Univ. of North Carolina, Pembroke, NC

**D55 The “hairy fungus beetles” of Wisconsin (Coleoptera: Mycetophagidae).**

Daniel K. Young, Jacquelyn Whisenant and **August Brunette** (ajbrunette@wisc.edu), Univ. of Wisconsin, Madison, WI

## TUESDAY, MARCH 19, 2019, MORNING

### Emerging Crop Pests in the North Central Branch

#### Bluegrass B (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Erin Hodgson, Iowa State Univ., Ames, IA; Anthony McMechan, Univ. of Nebraska, Lincoln, NE and Robert Wright, Univ. of Nebraska, Lincoln, NE

- 8:00 AM**      **Introductory Remarks**
- 8:05 AM**      **103**      **Notes from the fringe: Asiatic garden beetle.**  
*Kelley Tilmon* (tilmon.1@osu.edu)<sup>1</sup>, *Adrian Pekarick*<sup>1</sup> and *Chris DiFonzo*<sup>2</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>Michigan State Univ., East Lansing, MI
- 8:35 AM**      **104**      **Brown marmorated stink bug in the north central region.**  
*Kevin Rice* (RiceKev@missouri.edu)<sup>1</sup>, *Anne Nielsen*<sup>2</sup>, *Shelby J. Fleischer*<sup>3</sup> and *Tracy C. Leskey*<sup>4</sup>, <sup>1</sup>Univ. of Missouri, Columbia, MO, <sup>2</sup>Rutgers, The State Univ. of New Jersey, Bridgeton, NJ, <sup>3</sup>Pennsylvania State Univ., Univ. Park, PA, <sup>4</sup>USDA - ARS, Kearneysville, WV
- 9:05 AM**      **105**      **Soybean gall midge, a new pest in the north central region.**  
*Anthony McMechan* (justin.mcmechan@unl.edu)<sup>1</sup>, *Erin Hodgson*<sup>2</sup>, *Adam Varenhorst*<sup>3</sup>, *Bruce Potter*<sup>4</sup>, *Thomas Hunt*<sup>5</sup> and *Robert Wright*<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Iowa State Univ., Ames, IA, <sup>3</sup>South Dakota State Univ., Brookings, SD, <sup>4</sup>Univ. of Minnesota, Lamberton, MN, <sup>5</sup>Univ. of Nebraska, Concord, NE
- 9:35 AM**      **Break**
- 9:50 AM**      **106**      **Understanding population dynamics of the invasive spotted-wing *Drosophila* in the north central region to improve management strategies.**  
*Christelle Guédot* (guedot@wisc.edu) and *Benjamin Jaffe*, Univ. of Wisconsin, Madison, WI
- 10:20 AM**      **107**      **The wheat stem sawfly: Challenging pest management in wheat for 100 years.**  
*Jeffery Bradshaw* (jbradshaw2@unl.edu)<sup>1</sup>, *Bethany Bergstrom*<sup>2</sup> and *Wei-Zhen Liang*<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, Scottsbluff, NE, <sup>2</sup>Univ. of Nebraska, Lincoln, NE
- 10:50 AM**      **108**      **Status of the pea leaf weevil in the north central region.**  
*Travis Prochaska* (travis.prochaska@gmail.com)<sup>1</sup>, *Janet Knodel*<sup>2</sup>, *Patrick Beauzay*<sup>2</sup>, *Ryan Buetow*<sup>3</sup> and *Audrey Kalil*<sup>4</sup>, <sup>1</sup>North Dakota State Univ., Minot, ND, <sup>2</sup>North Dakota State Univ., Fargo, ND, <sup>3</sup>North Dakota State Univ., Dickinson, ND, <sup>4</sup>North Dakota State Univ., Williston, ND

### Pollinators and Biological Control: Overlap and Reciprocal Insights

#### Buckeye B (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Jason Harmon, North Dakota State Univ., Fargo, ND and Matthew O'Neal, Iowa State Univ., Ames, IA

- 8:00 AM**      **109**      **Trophic omnivory among pollinators and bio-control agents: Bees and nematodes eat 'microbial meat'.**  
*Shawn Steffan* (steffan@entomology.wisc.edu), USDA - ARS, Madison, WI
- 8:25 AM**      **110**      **Linking parasitoid nectar feeding and dispersal in conservation biological control.**  
*George Heimpel* (heimp001@umn.edu)<sup>1</sup> and *Jana Lee*<sup>2</sup>, <sup>1</sup>Univ. of Minnesota, St. Paul, MN, <sup>2</sup>USDA - ARS, Corvallis, OR
- 8:50 AM**      **111**      **Choices and consequences: Comparing the foraging behaviors of generalist predators and pollinators.**  
*Jason Harmon* (jason.harmon@ndsu.edu) and *Katherine Kral*, North Dakota State Univ., Fargo, ND
- 9:15 AM**      **Break**
- 9:35 AM**      **112**      **Assessing hover fly (Syrphidae) winter survival strategies in a midwestern agricultural landscape and implications for pollination and biological control.**  
*C. Scott Clem* (carlc2@illinois.edu) and *Alexandra Harmon-Threatt*, Univ. of Illinois, Champaign, IL
- 10:00 AM**      **113**      **Mechanisms of ground-dwelling beetle community assembly in an urban ecosystem.**  
*Kayla Perry* (perry.1864@osu.edu)<sup>1</sup>, *Nicole C. Hoekstra*<sup>2</sup>, *Yvan Delgado de la Flor*<sup>1</sup> and *Mary Gardiner*<sup>1</sup>, <sup>1</sup>The Ohio State Univ., Columbus, OH, <sup>2</sup>The Ohio State Univ., Wooster, OH
- 10:25 AM**      **Break (2)**
- 10:45 AM**      **114**      **Monitoring changes in native bee communities in Michigan, with a focus on agricultural landscapes.**  
*Kelsey Graham* (kelsey.katherine.graham@gmail.com)<sup>1</sup>, *Jason Gibbs*<sup>2</sup> and *Rufus Isaacs*<sup>1</sup>, <sup>1</sup>Michigan State Univ., East Lansing, MI, <sup>2</sup>Univ. of Manitoba, Winnipeg, MB, Canada
- 11:10 AM**      **115**      **Ecosystem service bundling: Integrating predator and pollinator responses to insecticides in midwestern cropping systems.**  
*Amanda Skidmore* (amanda.skidmore@gmail.com), *Jacob Pecenska*, *Ivan Grijalva*, *Christian Krupke*, *Laura Ingwell*, *Rick Foster*, *Steve Yaninek* and *Ian Kaplan*, Purdue Univ., West Lafayette, IN

- 11:35 AM 116 Honey bees (*Apis mellifera* [Hymenoptera: Apidae]) in prairie strips integrated into cropland can obtain improved forage in agricultural landscape.**  
**Ge Zhang** (gezhang@iastate.edu)<sup>1</sup>, Ashley St. Clair<sup>1</sup>, Adam Dolezal<sup>2</sup>, Caroline Murray<sup>1</sup>, Lisa Schulte Moore<sup>1</sup>, Amy Toth<sup>1</sup> and Matthew O'Neal<sup>1</sup>,  
<sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>Univ. of Illinois, Champaign, IL

## Submitted Ten-Minute Presentations: PI-E Session II

### Bluegrass A (Hyatt Regency Cincinnati)

**Moderator:** Laura Campbell, Dow AgroSciences, Carbondale, IL

- 8:00 AM 117 OPDA-mediated maize defense against aphids.**  
**Joe Louis** (joelouis@unl.edu), Univ. of Nebraska, Lincoln, NE
- 8:12 AM 118 Parasitism of frozen *Halyomorpha halys* eggs by *Trissolcus japonicus*: applications for rearing and experimentation.**  
**Hanna McIntosh** (hrmcintosh@wisc.edu)<sup>1</sup>, David Lowenstein<sup>2</sup>, Nik G. Wiman<sup>2</sup>, Jessica Wong<sup>3</sup> and Jana Lee<sup>3</sup>, <sup>1</sup>Univ. of Wisconsin, Madison, WI, <sup>2</sup>Oregon State Univ., Aurora, OR, <sup>3</sup>USDA - ARS, Corvallis, OR
- 8:24 AM 119 Why do some bumble bees die after foraging on some linden trees?**  
**Sujaya Rao** (sujaya@umn.edu)<sup>1</sup> and Claire Lande<sup>2</sup>, <sup>1</sup>Univ. of Minnesota, St. Paul, MN, <sup>2</sup>Oregon State Univ., Corvallis, OR
- 8:36 AM 120 What pollinators are visiting *Brassica carinata* in South Dakota?**  
**Madeline St. Claire** (madeline.stclaire@jacks.sdstate.edu), South Dakota State Univ., Brookings, SD
- 8:48 AM 121 Climate change, invasion, and bee pollinator losses in Guanacaste, Costa Rica.**  
**Theresa Wolanin** (twolanin1@kent.edu), Kent State Univ., North Canton, OH
- 9:00 AM 122 A bayesian state-space model for estimating larval survival probabilities from monarch butterfly (*Danaus plexippus*) field counts.**  
**Tyler Grant** (tgrant@iastate.edu)<sup>1</sup>, Tyler Flockhart<sup>2</sup>, Teresa Blader<sup>1</sup>, Grace Pitman<sup>3</sup>, Samantha Tyner<sup>1</sup>, Richard Hellmich<sup>4</sup>, Ryan Norris<sup>3</sup> and Steven Bradbury<sup>1</sup>, <sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>Univ. of Maryland Center for Environmental Science, Frostburg, MD, <sup>3</sup>Univ. of Guelph, Guelph, ON, Canada, <sup>4</sup>USDA - ARS, Ames, IA

- 9:12 AM 123 Spiders in grazed pastures: Comparisons between rotational vs. conventional grazing.**  
**Alan Cady** (cadyab@miamioh.edu)<sup>1</sup>, Tim Bankroff<sup>2</sup> and J. Coddington<sup>3</sup>, <sup>1</sup>Miami Univ., Middletown, OH, <sup>2</sup>Quantum Energy Services & Technologies, Inc., Hingham, MA, <sup>3</sup>Smithsonian Institution, National Museum of Natural History, Washington, DC
- 9:24 AM 124 Spotted lanternfly: Regulatory issues in Indiana.**  
**Ren Hall** (rhall@dnr.in.gov), Indiana Dept. of Natural Resources, Indianapolis, IN
- 9:36 AM 125 Effects of forest management and geography on leaf litter invertebrate communities.**  
**Gwendolyn Lloyd** (lloydg@miamioh.edu) and Thomas O. Crist, Miami Univ., Oxford, OH

## Insects, Microbes and Decomposition

### Buckeye A (Hyatt Regency Cincinnati)

**Moderator and Organizer:** M. Eric Benbow, Michigan State Univ., East Lansing, MI

- 10:00 AM 126 Insects, microbes and decomposition.**  
**M. Eric Benbow** (benbow@msu.edu), Michigan State Univ., East Lansing, MI
- 10:12 AM 127 Landscape context determines invertebrate contribution to vertebrate decomposition and pollination service.**  
**Sarah Cusser** (sarah.cusser@gmail.com) and Nick Haddad, Michigan State Univ., Hickory Corners, MI
- 10:24 AM 128 An assessment of wound cleansing treatments on maggot (Diptera: Calliphoridae) mortality.**  
**Sophie Racey** (sir74000@uga.edu)<sup>1</sup>, Richard Merritt<sup>2</sup> and Mollie McIntosh<sup>3</sup>, <sup>1</sup>Univ. of Georgia, Athens, GA, <sup>2</sup>Michigan State Univ., East Lansing, MI, <sup>3</sup>Xavier Univ., Cincinnati, OH
- 10:36 AM 129 Insects, microbes and leaf litter decomposition in a Michigan headwater stream: Changing riparian subsidies alter stream communities.**  
**Courtney Larson** (larso126@msu.edu) and M. Eric Benbow, Michigan State Univ., East Lansing, MI
- 10:48 AM 130 Using insects to decompose and recycle organic matter for developing alternative sources of protein in Malawi.**  
**Jennifer Pechal** (pechalje@msu.edu)<sup>1</sup>, Jeremiah Kang'ombe<sup>2</sup>, Andy Safalaoh<sup>2</sup>, Kingsley Masamba<sup>2</sup>, Arox Kamng'ona<sup>3</sup> and M. Eric Benbow<sup>1</sup>, <sup>1</sup>Michigan State Univ., East Lansing, MI, <sup>2</sup>Lilongwe Univ. of Agriculture and Natural Resources, Lilongwe, Malawi, <sup>3</sup>Univ. of Malawi, Blantyre, Malawi



- 11:12 AM 132 Potential evaporation as an index of decomposition at a site in Davis, California.**  
*Mark Mclellan* (mjmclellan@ucdavis.edu), Chloe Shott, Angel of Love Corniel, Alex Dedmon and Robert B. Kimsey, Univ. of California, Davis, CA
- 11:24 AM 133 Potential evaporation as an index of decomposition at a site in Dover, Delaware.**  
*Max Howard* (howar191@purdue.edu)<sup>1</sup>, Norwoh Kemoka<sup>2</sup>, Kanika Lambert<sup>3</sup>, Samantha Wolfgang<sup>3</sup> and Krystal Hans<sup>2</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>Delaware State Univ., Dover, DE, <sup>3</sup>Dover High School, Dover, DE
- 11:36 AM 134 Potential evaporation as an index of decomposition at a site in West Lafayette, Indiana.**  
*Max Howard* (howar191@purdue.edu)<sup>1</sup>, Krystal Hans<sup>2</sup> and Trevor Stamper<sup>3</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>Delaware State Univ., Dover, DE, <sup>3</sup>Univ. of Findlay, Findlay, OH
- 11:48 AM 135 Viability of potential evaporation hypothesis informing decomposition trends.**  
*Trevor Stamper* (stampert@purdue.edu)<sup>1</sup>, Krystal Hans<sup>2</sup> and Robert B. Kimsey<sup>3</sup>, <sup>1</sup>Univ. of Findlay, Findlay, OH, <sup>2</sup>Delaware State Univ., Dover, DE, <sup>3</sup>Univ. of California, Davis, CA
- 2:00 PM 138 Microbiomes meet spatio-temporal modeling: Disentangling the transmission of aphid vectored plant pathogens.**  
*Laramy Enders* (lenders@purdue.edu)<sup>1</sup>, Trevor Hefley<sup>2</sup>, C. Michael Smith<sup>2</sup> and Thorsten Hansen<sup>1</sup>, <sup>1</sup>Purdue Univ., West Lafayette, IN, <sup>2</sup>Kansas State Univ., Manhattan, KS
- 2:15 PM 139 Toxin tolerance of the navel orangeworm improved in the presence of *Aspergillus flavus*.**  
*Daniel Bush* (dsbush2@illinois.edu)<sup>1</sup>, Joel Seigel<sup>2</sup> and May Berenbaum<sup>1</sup>, <sup>1</sup>Univ. of Illinois, Champaign, IL, <sup>2</sup>USDA - ARS, Parlier, CA
- 2:30 PM 140 Symbiotic digestion of lignocellulose in fungus-farming termite.**  
*Hongjie Li* (hli555@wisc.edu) and Cameron Currie, Univ. of Wisconsin, Madison, WI
- 2:45 PM 141 Integrated metatranscriptome and metabolome analyses reveals importance of host-symbiont interactions for nutrient-provisioning role in the brown marmorated stink bug.**  
*Priyanka Mittapelly* (mittapelly.1@buckeyemail.osu.edu), Swapna Rajarapu, Larry Phelan and Andrew Michel, The Ohio State Univ., Wooster, OH

## TUESDAY, MARCH 19, 2019, AFTERNOON

### Insect Herbivory and the Plant Microbiome

#### Buckeye B (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Thorsten Hansen, Purdue Univ., West Lafayette, IN and Wadih Ghanem, Purdue Univ., West Lafayette, IN

- 1:30 PM 136 Life-stage specificity, Colorado potato beetles and microbes: can mycorrhizal composition predict herbivore response and plant anatomical defense?**  
*Rondy Malik* (rjm472@psu.edu)<sup>1</sup>, Jared Ali<sup>1</sup> and James Bever<sup>2</sup>, <sup>1</sup>Pennsylvania State Univ., Univ. Park, PA, <sup>2</sup>The Univ. of Kansas, Lawrence, KS
- 1:45 PM 137 The surprising influence of soil microbial community diversity on plant and insect interactions.**  
*Alison Bennett*<sup>1</sup>, *Antonino Malacrino* (antonino.malacrino@gmail.com)<sup>2</sup> and Alison Karley<sup>3</sup>, <sup>1</sup>The Ohio State Univ., Columbus, OH, <sup>2</sup>Linköping Univ., Linköping, Sweden, <sup>3</sup>James Hutton Institute, Dundee, United Kingdom

### Monitoring, Mitigation, and Miticide: What IPM Strategies Improve Honey Bee and Native Bee Health?

#### Buckeye A (Hyatt Regency Cincinnati)

**Organizers:** Randall Cass, Iowa State Univ. Extension and Outreach, Ames, IA and Judy Wu-Smart, Univ. of Nebraska, Lincoln, NE

- 1:30 PM 142 Selecting for behavioral resistance to *Varroa destructor*.**  
*Krispn Given* (kgiven@purdue.edu), Purdue Univ., West Lafayette, IN
- 1:40 PM 143 Estimating Neonicotinoid Residues in Pollinator Attractive Habitat by LC-MS/MS.**  
*Maura Hall* (mjhall@iastate.edu), Ge Zhang, Matthew O'Neal, Steven Bradbury and Joel R. Coats, Iowa State Univ., Ames, IA
- 1:50 PM 144 Comparing prophylactic vs. threshold based pest management and its impact on pollinators in commercial watermelon fields.**  
*John Ternest* (jternest@purdue.edu), Laura Ingwell, Ian Kaplan and Rick Foster, Purdue Univ., West Lafayette, IN

- 2:00 PM 145 Effects of pesticide residue accumulation on honey bee health.**  
*Jennifer Albrecht* (jennifer.mai1989@gmail.com) and *Judy Wu-Smart*, Univ. of Nebraska, Lincoln, NE
- 2:10 PM 146 Exploring mite management practices used by beekeepers in Ohio.**  
*Natalia Riusech* (Riusech.3@osu.edu)<sup>1</sup>, *Reed Johnson*<sup>1</sup> and *Alia Dietsch*<sup>2</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>The Ohio State Univ., Columbus, OH
- 2:20 PM 147 Pesticide exposure in managed bees during blueberry bloom, with implications for bee health.**  
*Kelsey Graham* (kelsey.katherine.graham@gmail.com), *Meghan Milbrath* and *Rufus Isaacs*, Michigan State Univ., East Lansing, MI
- 2:30 PM 148 Old brood comb: The effects of comb age and build-up on honey bee preference and survival.**  
*Stephanie Murray* (murray.968@osu.edu) and *Reed Johnson*, The Ohio State Univ., Wooster, OH
- 2:40 PM 149 Implementing IPM to improve pollinator health and profitability of Midwestern agroecosystems.**  
*Jacob Pecenka* (jacob.pecenka@gmail.com), *Laura Ingwell*, *Rick Foster*, *Christian Krupke* and *Ian Kaplan*, Purdue Univ., West Lafayette, IN
- 2:50 PM 150 Honey bee health in Midwestern rowcrop agriculture.**  
*Adam Dolezal* (adolezal@illinois.edu)<sup>1</sup>, *Ashley St. Clair*<sup>2</sup>, *Ge Zhang*<sup>3</sup>, *Harmen P. Hendriksma*<sup>2</sup>, *Randall Cass*<sup>3</sup>, *Erin Hodgson*<sup>2</sup>, *Amy Toth*<sup>2</sup> and *Matthew O'Nea*<sup>1</sup>, <sup>1</sup>Univ. of Illinois, Champaign, IL, <sup>2</sup>Iowa State Univ., Ames, IA, <sup>3</sup>Iowa State Univ. Extension and Outreach, Ames, IA
- 1:54 PM 153 A morphological exploration of dispersal ability in New Zealand riffle beetles.**  
*Rachel Neff* (neffr1@xavier.edu)<sup>1</sup> and *Crystal Maier*<sup>2</sup>, <sup>1</sup>Xavier Univ., Cincinnati, OH, <sup>2</sup>Field Museum of Natural History, Chicago, IL
- 2:06 PM 154 Genetic structure of the putative sex determination system in a monogenic blow fly (*Chrysomya ruffifacies*).**  
*Anne Andere* (aaandere@iupui.edu) and *Christine Picard*, Indiana Univ.-Purdue Univ., Indianapolis, IN
- 2:18 PM 155 High quality draft genome assemblies for stored product insects.**  
*Erin Scully* (erin.scully@ars.usda.gov), USDA - ARS, Manhattan, KS
- 2:30 PM 156 Challenges of gene therapy for pest management.**  
*Shripat Kamble* (skamble1@unl.edu), Univ. of Nebraska, Lincoln, NE
- 2:42 PM 157 Nutrient deprivation during larval development causes lasting impacts on the midgut microbiome of *Aedes aegypti* mosquitoes.**  
*Sarah Short* (short.343@osu.edu)<sup>1</sup>, *Hannah MacLeod*<sup>2</sup> and *George Dimopoulos*<sup>2</sup>, <sup>1</sup>The Ohio State Univ., Columbus, OH, <sup>2</sup>Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 2:54 PM 158 Investigating the mite biting behavior in the Midwest bee colony.**  
*Jada Smith* (smith.jada@live.com)<sup>1</sup>, *Shudong Luo*<sup>2</sup> and *Hongmei Li-Byarlay*<sup>1</sup>, <sup>1</sup>Central State Univ., Wilberforce, OH, <sup>2</sup>Chinese Academy of Agricultural Sciences, Beijing, China

## Submitted Ten-Minute Presentations: MUVE, PBT, SysEB Session

### Bluegrass A (Hyatt Regency Cincinnati)

**Moderator:** John Ruberson, Univ. of Nebraska-Lincoln, Lincoln, NE

- 1:30 PM 151 A practical application of an aerosol treatment in commercial rice mill.**  
*Deanna Scheff* (deanna.scheff@ars.usda.gov), *Dan Brabec*, *James Campbell* and *Frank Arthur*, USDA - ARS, Manhattan, KS
- 1:42 PM 152 The Ohio dragonfly survey: Community driven science using iNaturalist.**  
*MaLisa Spring* (spring.99@osu.edu) and *Norman Johnson*, The Ohio State Univ., Columbus, OH

## Niche Specialization: Communicating Science to Targeted Audiences

### Bluegrass A (Hyatt Regency Cincinnati)

**Organizers:** Benjamin Jaffe, Univ. of Wisconsin, Madison, WI; Amy Morey, Univ. of Minnesota, St. Paul, MN; Rob Morrison, USDA - ARS, Manhattan, KS; Hannah Penn, Louisiana State Univ., Baton Rouge, LA and Ana Velez, Univ. of Nebraska, Lincoln, NE

- 3:30 PM 159 The multiverse of communicating pollinator health science to diverse stakeholder groups.**  
*Judy Wu-Smart* (jwu-smart@unl.edu), Univ. of Nebraska, Lincoln, NE
- 3:45 PM 160 4-H Youth Programs: Outreach opportunities to inspire future leaders in science.**  
*Alexandria Bryant* (alexandria.bryant@uky.edu)<sup>1</sup> and *Wade Raymer*<sup>2</sup>, <sup>1</sup>Univ. of Kentucky, Hardinsburg, KY, <sup>2</sup>Extension Agent for 4-H Youth Development Education, Dixon, KY

- 4:00 PM 161 Communicating entomological and related science topics to (and from) disparate university student audiences.**  
*Daniel K. Young* ([young@entomology.wisc.edu](mailto:young@entomology.wisc.edu)), Univ. of Wisconsin, Madison, WI
- 4:15 PM 162 Extension communication on emerging issues: Tools, resources and following up.**  
*Anthony McMechan* ([justin.mcmehan@unl.edu](mailto:justin.mcmehan@unl.edu)), Univ. of Nebraska, Lincoln, NE
- 4:30 PM 163 Science and scientists in the policy arena.**  
*Clare Rittschof* ([clare.rittshof@uky.edu](mailto:clare.rittshof@uky.edu)), Univ. of Kentucky, Lexington, KY
- 4:45 PM 164 Clarity, consistency, and concern: Communication in support of an invasive species research center.**  
*Robert Venette* ([rvenette@fs.fed.us](mailto:rvenette@fs.fed.us)), USDA - Forest Service, St. Paul, MN

## Submitted Ten-Minute Presentations: PI-E Session I

### Buckeye A (Hyatt Regency Cincinnati)

**Moderator:** Débora Montezano, Univ. of Nebraska, Lincoln, NE

- 3:30 PM 165 Fitness parameters of a Minnesota acclimated Brown Marmorated Stink Bug population at constant lab and ambient field temperatures, using two-sex life tables.**  
*Byju Nambidiyattil Govindan* ([ngbyju@gmail.com](mailto:ngbyju@gmail.com))<sup>1</sup>, Robert Koch<sup>1</sup>, Angie Ambourn<sup>2</sup> and William D. Hutchison<sup>1</sup>, <sup>1</sup>Univ. of Minnesota, St. Paul, MN, <sup>2</sup>Minnesota Dept. of Agriculture, St. Paul, MN

- 3:42 PM 166 Factors affecting the distribution of barley yellow dwarf virus in Indiana cereal aphids.**  
*Colleen Couch* ([couch4@purdue.edu](mailto:couch4@purdue.edu)), Thorsten Hansen and Laramy Enders, Purdue Univ., West Lafayette, IN
- 3:54 PM 167 Potential climate suitability for the larger grain borer, *Prostephanus truncatus* (Coleoptera: Bostrichidae): Implications for range expansion and establishment.**  
*Frank Arthur* ([frank.arthur@ars.usda.gov](mailto:frank.arthur@ars.usda.gov))<sup>1</sup>, William Morrison<sup>1</sup> and Amy Morey<sup>2</sup>, <sup>1</sup>USDA - ARS, Manhattan, KS, <sup>2</sup>Univ. of Minnesota, St. Paul, MN
- 4:06 PM 168 Interspersed refuge for sustainable management of virulent *Aphis glycines*.**  
*Jessica Hohenstein* ([jdhoven@iastate.edu](mailto:jdhoven@iastate.edu))<sup>1</sup>, Matthew Kaiser<sup>1</sup>, Kelley Tilmon<sup>2</sup>, Adam Varenhorst<sup>3</sup>, Deirdre Prischmann-Voldseth<sup>4</sup>, Bruce Potter<sup>5</sup>, Erin Hodgson<sup>1</sup> and Matthew O'Neal<sup>1</sup>, <sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>The Ohio State Univ., Wooster, OH, <sup>3</sup>South Dakota State Univ., Brookings, SD, <sup>4</sup>North Dakota State Univ., Fargo, ND, <sup>5</sup>Univ. of Minnesota, Lamberton, MN
- 4:18 PM 169 Seed treatment efficacy in varied growing environments.**  
*Cole Dierks* ([cole.dierks@sdstate.edu](mailto:cole.dierks@sdstate.edu)), Brady Hauswedell, Philip Rozeboom and Adam Varenhorst, South Dakota State Univ., Brookings, SD
- 4:30 PM 170 Evaluating belowground management options in sunflowers.**  
*Adam Varenhorst* ([adam.varenhorst@sdstate.edu](mailto:adam.varenhorst@sdstate.edu))<sup>1</sup>, Brady Hauswedell<sup>1</sup>, Philip Rozeboom<sup>1</sup> and Patrick Wagner<sup>2</sup>, <sup>1</sup>South Dakota State Univ., Brookings, SD, <sup>2</sup>South Dakota State Univ., Rapid City, SD



## WEDNESDAY, MARCH 20, 2019, MORNING

Zukoff<sup>a</sup> and Julie Peterson<sup>1</sup>, <sup>1</sup>Univ. of Nebraska, North Platte, NE, <sup>2</sup>Univ. of Nebraska, Concord, NE, <sup>3</sup>USDA - ARS, Ames, IA, <sup>4</sup>Kansas State Univ., Garden City, KS

### Insect Resistance: Challenges to Current Technologies

#### Buckeye A (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Nick Seiter, Univ. of Illinois, Champaign, IL; Raul T. Villanueva, Univ. of Kentucky, Princeton, KY and Brian McCornack, Kansas State Univ., Manhattan, KS

- 8:00 AM 173 Responding to pyrethroid-resistant soybean aphid: How limited is our tool box?**  
**Robert Koch** (koch0125@umn.edu), Univ. of Minnesota, St. Paul, MN
- 8:20 AM 174 Challenges associated with soybean aphids and Rag genes.**  
**Adam Varenhorst** (adam.varenhorst@sdstate.edu)<sup>1</sup>, Matthew O'Neal<sup>2</sup> and Michael McCarville<sup>3</sup>, <sup>1</sup>South Dakota State Univ., Brookings, SD, <sup>2</sup>Iowa State Univ., Ames, IA, <sup>3</sup>BASF, Omaha, NE
- 8:40 AM 175 Molecular interactions between soybean aphids and aphid-resistant soybean.**  
**Ashley Yates-Stewart** (yates.229@buckeyemail.osu.edu)<sup>1</sup>, Josquin Daron<sup>2</sup>, Saranga Wijeratne<sup>1</sup>, Raman Bansal<sup>1</sup>, R. Slotkin<sup>3</sup>, Joshua Blakeslee<sup>1</sup> and Andrew Michel<sup>1</sup>, <sup>1</sup>The Ohio State Univ., Wooster, OH, <sup>2</sup>Centre National de la Recherche Scientifique, Montpellier, France, <sup>3</sup>Donald Danforth Plant Science Center, St. Louis, MO
- 9:00 AM 176 Western corn rootworm in agricultural landscapes in Iowa: Testing for patterns in root injury to corn, rootworm abundance, and Bt resistance.**  
**Coy St. Clair** (cstclair@iastate.edu)<sup>1</sup>, Graham P. Head<sup>2</sup> and Aaron J. Gassmann<sup>1</sup>, <sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>Bayer Crop Science, St. Louis, MO
- 9:20 AM 177 Western corn rootworm resistance to pyrethroids in the U.S. western corn belt.**  
**Dariane Souza** (dsouza3@unl.edu) and Lance Meinke, Univ. of Nebraska, Lincoln, NE
- 9:40 AM 178 Corn earworm and Bt corn in the southeast: Development, feeding, susceptibility, and implications for resistance.**  
**Thomas Bilbo** (bilbothomas@gmail.com)<sup>1</sup>, Francis Reay-Jones<sup>1</sup>, Dominic Reisig<sup>2</sup>, Jeremy Greene<sup>3</sup> and Matthew Turnbull<sup>4</sup>, <sup>1</sup>Clemson Univ., Florence, SC, <sup>2</sup>North Carolina State Univ., Plymouth, NC, <sup>3</sup>Clemson Univ., Blackville, SC, <sup>4</sup>Clemson Univ., Clemson, SC
- 10:00 AM 179 The movement of western bean cutworm (*Striacosta albicosta*) larvae in field corn: Implications for IRM.**  
**Katharine Swoboda Bhattarai** (kswoboda3@unl.edu)<sup>1</sup>, Thomas Hunt<sup>2</sup>, Brad Coates<sup>3</sup>, Sarah

### Hemp: A New Frontier for Entomology

#### Bluegrass A (Hyatt Regency Cincinnati)

**Moderators and Organizers:** Amanda Skidmore, Univ. of Kentucky, Lexington, KY; Marguerite Bolt, Purdue Univ., West Lafayette, IN; Kadie Britt, Virginia Polytechnic Institute and State Univ., Blacksburg, VA; Melissa Schreiner, Colorado State Univ., Fort Collins, CO and Cody Seals, Univ. of Tennessee, Knoxville, TN

- 8:00 AM Welcoming Remarks**
- 8:05 AM 180 Temporal changes in industrial hemp phytochemicals and influence of phytochemicals on insect herbivory.**  
**Marguerite Bolt** (mbolt@purdue.edu), Janna Beckerman and John Couture, Purdue Univ., West Lafayette, IN
- 8:25 AM 181 Insects associated with hemp in the High Plains and Rocky Mountain region: An update.**  
**Melissa Schreiner** (mschreiner1108@gmail.com) and Whitney Cranshaw, Colorado State Univ., Fort Collins, CO
- 8:45 AM 182 What we know about insects in Virginia hemp.**  
**Kadie Britt** (kadiab@vt.edu) and Thomas Kuhar, Virginia Polytechnic Institute and State Univ., Blacksburg, VA
- 9:05 AM 183 Hemp and bugs and mites, oh my!: Status of hemp in Tennessee.**  
**Jerome Grant** (jgrant@utk.edu)<sup>1</sup>, Cody Seals<sup>1</sup> and Frank Hale<sup>2</sup>, <sup>1</sup>Univ. of Tennessee, Knoxville, TN, <sup>2</sup>Univ. of Tennessee, Nashville, TN
- 9:25 AM Break**
- 9:45 AM 184 Hemp plant pathogens.**  
**Janna Beckerman** (jbeckerm@purdue.edu), Purdue Univ., West Lafayette, IN
- 10:05 AM 185 Overview of the hemp industry in Kentucky.**  
**David Williams** (dwilliam@uky.edu), Univ. of Kentucky, Jackson, KY
- 10:25 AM 186 Validating a predictive model of cannabinoid inheritance with Minnesota ditch weed (*Cannabis sativa*).**  
**George Weiblen** (gweiblen@umn.edu), Johnathan Wenger and Clemon Dabney, Univ. of Minnesota, St. Paul, MN
- 10:45 AM 187 Insect pests in hemp production.**  
**Tom Hutchens** (thutchens@ataloholdings.com), Atalo Holdings, Winchester, KY
- 11:05 AM Discussion**
- 11:35 AM Concluding Remarks**

## Taking a Step Back: Looking to Basic Biology and Behavior to Better Inform Pest Management

**Buckeye B (Hyatt Regency Cincinnati)**

**Moderators and Organizers:** Benjamin Jaffe, Univ. of Wisconsin, Madison, WI; Scott O'Neal, Univ. of Nebraska, Lincoln, NE and Christelle Guédot, Univ. of Wisconsin, Madison, WI

- 8:00 AM 188** Is the traditional "Hessian fly-free date" still valid in Kansas? How does it impact pest management?  
*Holly Schwarting* (holly3@ksu.edu) and Jeff Whitworth, Kansas State Univ., Manhattan, KS
- 8:15 AM 189** Characterization of field populations: A key to sustainable management of western corn rootworm.  
*Ram B. Shrestha* (shrestbr@iastate.edu)<sup>1</sup> and Aaron Gassman<sup>2</sup>, <sup>1</sup>Iowa State Univ., Ames, IA, <sup>2</sup>Univ. of Arizona, Tucson, AZ
- 8:30 AM 190** Assessment of larval risk factors to fungicide exposure: The buzz from *in vitro* reared solitary bees.  
*Prarthana Dharampal* (prarthana.1120@gmail.com)<sup>1</sup> and Shawn Steffan<sup>2</sup>, <sup>1</sup>Univ. of Wisconsin, Madison, WI, <sup>2</sup>USDA - ARS, Madison, WI
- 8:45 AM 191** Harnessing anti-predator behavioral responses to manage insect pests.  
*Sara Hermann* (slh@msu.edu) and Douglas A. Landis, Michigan State Univ., East Lansing, MI
- 9:00 AM 192** Biological factors affecting brown marmorated stink bug management.  
*Theresa Cira* (cirax002@umn.edu)<sup>1</sup>, William D. Hutchison<sup>1</sup>, Robert Koch<sup>1</sup>, Eric C. Burkness<sup>1</sup> and Robert Venette<sup>2</sup>, <sup>1</sup>Univ. of Minnesota, St. Paul, MN, <sup>2</sup>USDA - Forest Service, St. Paul, MN
- 9:15 AM 193** Sweating the small stuff: Effects of drought for aphid performance and behavior.  
*Jessica Kansman* (jtkp8b@missouri.edu) and Debbie Finke, Univ. of Missouri, Columbia, MO
- 9:30 AM 194** Behavioral and physiological resistance to desiccation in spotted-wing *Drosophila* (*Drosophila suzukii*).  
*Philip Fanning* (fanning9@msu.edu)<sup>1</sup>, Benjamin Luttinen<sup>2</sup>, Anne Johnson<sup>1</sup>, Elizabeth Espeland<sup>1</sup>, Nolan Jahn<sup>1</sup> and Rufus Isaacs<sup>1</sup>, <sup>1</sup>Michigan State Univ., East Lansing, MI, <sup>2</sup>Univ. of Georgia, Athens, GA
- 9:45 AM 195** Environmental factors that impact biological control under cover.  
*Laura Ingwell* (laura.ingwell@gmail.com) and Reham Mohamed, Purdue Univ., West Lafayette, IN
- 10:00 AM** Break

- 10:15 AM 196** Overwintering and larval behavior of red-headed flea beetle (*Systema frontalis*) informs management decisions in Wisconsin cranberry (*Vaccinium macrocarpon*).  
*Benjamin Jaffe* (bjaffe2@wisc.edu) and Christelle Guédot, Univ. of Wisconsin, Madison, WI
- 10:30 AM 197** *Leptinotarsa decemlineata* temporal patterns of delayed emergence results in increased insecticide resistance to agriculturally relevant insecticides.  
*Justin Clements* (jclements2@wisc.edu), Benjamin Sanchez-Sedillo, Benjamin Bradford, Linda Crubaugh, Jake Olson and Russell Groves, Univ. of Wisconsin, Madison, WI
- 10:45 AM 198** Response of ground-dwelling invertebrates to temporal patterns of emerald ash borer-induced ash mortality.  
*Kayla Perry* (perry.1864@osu.edu)<sup>1</sup> and Daniel Herms<sup>2</sup>, <sup>1</sup>The Ohio State Univ., Columbus, OH, <sup>2</sup>Davey Tree Expert Company, Kent, OH
- 11:00 AM 199** Improving current *Striacosta albicosta* (Lepidoptera: Noctuidae) IPM with recent research concerning its basic biology and behavior.  
*Débora Montezano* (deiagm@gmail.com)<sup>1</sup>, Thomas Hunt<sup>2</sup> and Julie Peterson<sup>3</sup>, <sup>1</sup>Univ. of Nebraska, Lincoln, NE, <sup>2</sup>Univ. of Nebraska, Concord, NE, <sup>3</sup>Univ. of Nebraska, North Platte, NE
- 11:15 AM 200** From lab studies to the field: How the behavioral ecology of post-harvest insects can inform monitoring, management, and quarantine programs.  
*Rob Morrison* (william.morrison@gmail.com)<sup>1</sup>, Robert Grosdidier<sup>2</sup>, Frank Arthur<sup>1</sup>, Christos Athanassiou<sup>3</sup>, Scott W. Myers<sup>4</sup> and Michael Domingue<sup>4</sup>, <sup>1</sup>USDA - ARS, Manhattan, KS, <sup>2</sup>Kansas State Univ., Manhattan, KS, <sup>3</sup>Univ. of Thessaly, Nea Ionia, Greece, <sup>4</sup>USDA - APHIS, Buzzards Bay, MA
- 11:30 AM 201** Investigating biorational synergists to improve management of disease vector mosquitoes.  
*Scott O'Neal* (soneal3@unl.edu), Leslie Rault, Ellis Johnson and Troy Anderson, Univ. of Nebraska, Lincoln, NE
- 11:45 AM 202** Unraveling the genetic underpinnings of cold tolerance in an emerging invasive pest species.  
*Mark Garcia* (mark.garcia@uky.edu) and Nicholas Teets, Univ. of Kentucky, Lexington, KY

# Author Index

* presenting	Blader, Teresa . . . . .	122
Abdoijabbar, Soheila . . . . .	Blakeslee, Joshua . . . . .	175
Abts, Shelby . . . . .	Bolt, Marguerite . . . . .	180*
Ademokoya, Blessing . . . . .	Bolton, Grant . . . . .	D28*
Adesemoye, Anthony . . . . .	Brabec, Dan . . . . .	151
Albin, Chloe . . . . .	Bradbury, Steven . . . . .	D6, 58, 122, 143
Albrecht, Jennifer . . . . .	Bradford, Benjamin . . . . .	D31, 197
Ali, Fathi . . . . .	Bradshaw, Jeffery . . . . .	38, 107*
Ali, Jared . . . . .	Bradshaw, Jeffrey . . . . .	99
Allan, Brian F. . . . .	Britt, Kadie . . . . .	D27*, 182*
Althoff, Emily . . . . .	Brunet, Johanne . . . . .	63
Ambourn, Angie . . . . .	Brunette, August . . . . .	D55*
Andere, Anne . . . . .	Bryant, Alexandria . . . . .	160*
Anderson, Erica . . . . .	Buetow, Ryan . . . . .	108
Anderson, Troy . . . . .	Burger, Derek . . . . .	D3*
Anderson, Valerie . . . . .	Burkness, Eric C. . . . .	97, 192
Andrews, Megan . . . . .	Bush, Daniel . . . . .	139*
Appenfeller, Logan . . . . .	Cady, Alan . . . . .	123*
Armstrong, Paul . . . . .	Campbell, James . . . . .	D4, 3*, 4, 78, 151
Arthur, Frank . . . . .	Campbell, Kaitlin . . . . .	D54
Athanassiou, Christos . . . . .	Campos, Julia . . . . .	D17*
Bachmann, Amanda . . . . .	Canas, Luis . . . . .	D39, D24, 1*, 15
Bakker, Matt . . . . .	Cass, Randall . . . . .	101, 150
Bankroff, Tim . . . . .	Chang, Michelle . . . . .	D24
Bansal, Raman . . . . .	Chapman, Kaitlin . . . . .	D23*
Baributsa, Dieudonne . . . . .	Cipollini, Don . . . . .	60
Barrett, Bruce . . . . .	Cira, Theresa . . . . .	192*
Barry, Julie . . . . .	Clark, Matthew . . . . .	97
Beauzay, Patrick . . . . .	Clem, C. Scott . . . . .	112*
Beckerman, Janna . . . . .	Clements, Justin . . . . .	D31, 197*
Benbow, M. Eric . . . . .	Cluever, Jeffrey . . . . .	99*
Benkert III, Edwin . . . . .	Coates, Brad . . . . .	53, 179
Bennett, Alison . . . . .	Coats, Joel R. . . . .	49, 53, 54, 143
Benoit, Joshua . . . . .	Coddington, J. . . . .	123
Benthall, Kelsey . . . . .	Colombo Da Luz, Priscila . . . . .	99
Berenbaum, May . . . . .	Corniel, Angel of Love . . . . .	132
Bergstrom, Bethany . . . . .	Corona, Caleb . . . . .	49*
Bessin, Ric . . . . .	Cotrozz, Lorenzo . . . . .	93
Bever, James . . . . .	Couch, Colleen . . . . .	65, 166*
Bilbo, Thomas . . . . .	Couture, John . . . . .	62, 67, 93, 180
Bingham, Georgina . . . . .	Craigie, Grace . . . . .	39*

- Cranshaw, Whitney..... 181  
 Crespo, Andre..... D43  
 Crist, Thomas O..... D54, D45, 125  
 Crubaugh, Linda ..... D31, 197  
 Crystal, Kylie ..... 54  
 Cunningham-Minnick, Michael ..... D36  
 Cunningham-Minnick, Michael J. .... D45\*  
 Currie, Cameron ..... 140  
 Cusser, Sarah..... 127\*  
 Dabney, Clemon ..... 186  
 Danso, James ..... 3, 4  
 Daron, Josquin..... 175  
 Davidson, Benjamin..... D44, 40  
 Davis, Amélie ..... 11\*  
 Davis, Steve..... 28  
 Dean, Ashley..... 42\*  
 Dedmon, Alex ..... 132  
 DeGrey, Samuel..... 28\*  
 Delgado de la Flor, Yvan ..... 35, 113  
 Den Uyl, James..... D44, 40  
 Dharampal, Prarthana ..... 190\*  
 Didion, Elise ..... 80  
 Dierks, Cole ..... D21\*, D22, 169\*  
 Dietsch, Alia ..... 146  
 DiFonzo, Chris ..... 57, 103  
 Dimopoulos, George ..... 157  
 Dobson, Stephen ..... D30, D1  
 Dolezal, Adam ..... 101, 116, 150\*  
 Doll, Laura ..... D11\*  
 Domingue, Michael ..... 200  
 Dunaway, Amanda..... 34\*  
 Dunkle, Ellen..... 19\*  
 Eaton, Tyler D..... 12  
 Ebbenga, Dominique ..... 97\*  
 Edde, Peter ..... 22  
 El-Shesheny, Ibrahim..... D34\*  
 Eller, Fred ..... D4  
 Enders, Laramy..... 47, 62, 65\*, 138\*, 166  
 Ercan, Gülçin..... 92\*  
 Espeland, Elizabeth ..... 194  
 Esquivel, Carlos ..... D24\*  
 Estes, Ronald..... D46\*  
 Estes, Samantha ..... 17  
 Evans, Sean ..... 98  
 Fann, Lauren..... 46\*  
 Fanning, Philip..... 194\*  
 Featherston, Kyah..... 25\*  
 Finke, Debbie ..... D14, D26, 193  
 Fisher, Kelsey E. .... D6, 58\*, 69\*  
 Fleischer, Shelby J. .... 104  
 Flockhart, Tyler..... 122  
 Foster, Brianna ..... D50\*  
 Foster, Rick ..... D12, 115, 144, 149  
 Franzen, Emily ..... 17, 18  
 Fuller, Billy ..... D48, 94  
 Gaddis, Margaret..... 82\*  
 Garcia, Mark ..... 202\*  
 Gardiner, Mary ..... 19, 30, 35, 61, 87, 102, 113  
 Gassman, Aaron ..... 189  
 Gassmann, Aaron J. .... 176  
 Geedi, Ruchika ..... D39\*  
 Geers, Erica ..... 17  
 Gerken, Alison ..... 78\*  
 Gibbs, Jason ..... 114  
 Gilhooly III, William..... 52  
 Ginzel, Matthew ..... 89  
 Given, Krispn ..... 142\*  
 Goldner, Jakob..... 73\*  
 Gomes, Izabela..... D20\*  
 Gonzalez, Yaziri ..... D51\*  
 Graham, Kelsey ..... 114\*, 147\*  
 Granadino, Carlos ..... D46  
 Grant, Jerome..... 183\*  
 Grant, Tyler ..... 122\*  
 Greene, Jeremy ..... 178  
 Grieshop, Matthew..... D19, 16  
 Grijalva, Ivan..... D12\*, 115  
 Grosdidier, Robert..... 200  
 Grover, Sajjan ..... 95\*  
 Groves, Russell ..... D31, 197  
 Guédot, Christelle..... 106\*, 196  
 Guevara, Luisa Maria ..... D37  
 Gula, Scott..... 89\*  
 Haddad, Nick ..... 127  
 Hagler, James..... 89  
 Hale, Frank..... 183  
 Hall, Benjamin ..... 71  
 Hall, Maura ..... 143\*  
 Hall, Ren ..... D47\*, 124\*  
 Hans, Krystal..... 133, 134, 135

Hansen, Thorsten .....	62*, 65, 138, 166	Jahn, Nolan .....	194
Hardiman, Brady .....	93	Jennings, Emily C. ....	80
Harmon, Jason .....	111*	Jeschke, Mark .....	D43
Harmon-Threatt, Alexandra ..	112	Johnson, Anne .....	194
Harpur, Brock .....	10*	Johnson, Ellis .....	201
Harris, Mary .....	D13, 32	Johnson, Jacob .....	54
Hassan, El-Said .....	D34	Johnson, Kelly .....	D32, D5
Hauri, Kayleigh .....	91*	Johnson, Norman .....	152
Hauswedell, Brady .....	D21, 169, 170	Johnson, Reed .....	D18, D16, 12*, 146, 148
Head, Graham P. ....	98, 176	Jones, Emily .....	D15*
Hearon, Luke .....	12	Jones, Susan C. ....	13, 14
Hefley, Trevor .....	138	Juma, Elijah .....	51*
Heideman, Paul .....	83*	Justus, Emily .....	64*
Heimpel, George .....	59, 110*	Kaiser, Matthew .....	168
Hein, Gary .....	38, 43	Kalil, Audrey .....	108
Hellmich, Richard .....	122	Kamble, Shripat .....	156*
Helm, Alisha .....	20*	Kamminga, Katherine .....	8*
Helmy, Yosra .....	48	Kamng'ona, Arox .....	130
Hendriksma, Harmen P. ....	101, 150	Kang'ombe, Jeremiah .....	130
Hermann, Sara .....	191*	Kansman, Jessica .....	193*
Herms, Daniel .....	198	Kaplan, Ian .....	115, 144, 149
Herron, Olivia .....	11	Karley, Alison .....	137
Hesler, Louis .....	D42*	Kemokai, Norwoh .....	133
Hetherington, Matthew .....	63*	Khajuria, Chitvan .....	29
Hibbard, Bruce .....	D38	Kimsey, Robert B. ....	132, 135
Hicks, Jakob .....	D22*	Klimavicz, James .....	49
Hodgson, Erin .....	D6, D3, 41, 42, 53, 105, 150, 168	Knodel, Janet .....	108
Hoekstra, Nicole C. ....	113	Koch, Robert .....	D41, 165, 173*, 192
Hohenstein, Jessica .....	D3, 53, 168*	Kohrt, Jonathan .....	D46
Holmes, Christopher .....	80*	Kootner, Keith .....	16
Howard, Max .....	133*, 134*	Kositzke, Christoph .....	D30, D1*
Hu, Wuyang .....	D36	Kral, Katherine .....	111
Hua-Lin, Chia .....	12	Krupke, Christian .....	115, 149
Huang, Juan .....	16	Kuhar, Thomas .....	D27, 182
Hunt, Thomas .....	56, 105, 179, 199	Lambert, Kanika .....	133
Hutchens, Tom .....	187*	Landa, Asheesh .....	71
Hutchison, William D. ....	97, 165, 192	Lande, Claire .....	119
Ingwell, Laura .....	115, 144, 149, 195*	Landis, Douglas A. ....	191
Inveninato Carmona, Gabriela .....	90*	LaPlante, Katie .....	D26*
Iruri-Tucker, Alec .....	11	Larson, Courtney .....	129*
Isaacs, Rufus .....	114, 147, 194	Lee, Jana .....	110, 118
Israel, Trevor .....	D46	Leskey, Tracy C. ....	104
Jacobs, Douglas .....	93	Li, Hongjie .....	140*
Jaffe, Benjamin .....	106, 196*	Li-Byarlay, Hongmei .....	6*, 20, 158
		Liang, Wei-Zhen .....	107



- Liebman, Matthew ..... 41
- Lindsay, Shianne ..... D8\*
- Lloyd, Gwendolyn..... 125\*
- Long, Elizabeth ..... 64
- Lopez, Vanessa..... 89
- Louis, Joe ..... D23, 24, 79, 95, 117\*
- Lowenstein, David ..... 118
- Lundgren, Jonathan..... 70\*
- Luo, Shudong..... 9\*, 20, 158
- Luttinen, Benjamin..... 194
- Machtley, Scott ..... 89
- Mackert, Morgan..... D13\*, 32\*
- MacLeod, Hannah..... 157
- Mahon, Michael..... D54\*
- Maier, Crystal ..... 153
- Maille, Jacqueline ..... 22\*
- Majeski, Michele ..... D50
- Malacrinò, Antonino ..... 137\*
- Malik, Rondy..... 136\*
- Mankin, Richard..... 2
- Manu, Naomi ..... 3, 4
- Masamba, Kingsley ..... 130
- Mason, Linda ..... 47
- Matcham, Emma..... 12
- Matisoff, Martin ..... 8
- Mattern, Mackenzie ..... D40\*, 26\*
- Mbata, George ..... 3
- Mbata, George N. .... 4
- McCarville, Michael ..... 174
- McCormick, Susan ..... D2
- McCornack, Brian ..... 39, 72\*
- McIntosh, Hanna..... 118\*
- McIntosh, Mollie ..... 128
- McIellan, Mark ..... 132\*
- McMechan, Anthony..... 90, 105\*, 162\*
- McMechan, Justin..... D17
- McMinn-Sauder, Harper..... D16\*
- McNeill, Samuel..... 3, 4
- McNickle, Gordon..... 93
- Meinke, Lance ..... 29, 98, 177
- Merritt, Richard ..... 128
- Mesbah, Ibrahim..... D34
- Michel, Andrew ..... D24, 48, 141, 175
- Miksane, James ..... 59\*
- Milbrath, Meghan..... 147
- Mittapelly, Priyanka ..... 141\*
- Moar, William ..... 29, 98
- Mohamed, Reham ..... 195
- Montezano, Débora..... 99, 199\*
- Mooney, Emily ..... D44, 40, 81\*
- Morey, Amy..... 167
- Morrison, Rob..... 85, 200\*
- Morrison, William ..... D4, D25, 167
- Mortensen, Allan..... 5
- Mullins, Maria..... D44, 40\*
- Murray, Caroline ..... 37\*, 116
- Murray, Stephanie..... D18\*, 148\*
- Muturi, Ephantus ..... 51
- Myers, Scott W..... 200
- Nambidiyattil Govindan, Byju..... 165\*
- Neff, Rachel..... 153\*
- Nelson, Taylor..... 93\*
- Nguyen, Valerie ..... D2\*, 78
- Nielsen, Anne..... 104
- Nigoghosian, Gregory..... 27\*
- Nine, Gabriela..... 80
- Njoroge, Anastasia ..... 2\*
- Njoroge, Teresia..... 50\*
- Norris, Ryan..... 122
- O'Neal, Matthew ..... D3, 37, 41, 42, 53, 101, 116, 143, 150, 168, 174
- O'Neal, Scott..... 201\*
- Olson, Jake ..... D31, 197
- Opit, George..... 3, 4, 5
- Osekre, Enoch A..... 3, 5
- Ostlie, Ken ..... D50, 100
- Ostlie, Kenneth ..... D49\*
- Otitodun, Grace O. .... 5
- Ott, Eric..... D46
- Overmyer, Lindsay ..... 43\*
- Owings, Charity..... D11, 52\*
- Paddock, Kyle..... D38\*
- Pagani, Mika ..... D27
- Palli, Subba Reddy ..... 66\*
- Park, Yoonseong ..... 25, 75
- Parker, Denisha ..... 87\*
- Pecenka, Jacob ..... 115, 149\*
- Pechal, Jennifer ..... 130\*
- Pekarcik, Adrian..... 57\*, 103
- Penn, Hannah..... D36\*

- Penn, Jerrod ..... D36
- Pereira, Adriano ..... D38
- Peron, Raquel ..... 67\*
- Perry, Kayla ..... 113\*, 198\*
- Perry, Kayla L. .... 19, 35
- Peters, Valerie ..... 34
- Peters, Valerie E. .... D45
- Peterson, Donnie L. .... 60\*
- Peterson, Julie ..... 92, 99, 179, 199
- Phelan, Larry ..... 141
- Phillips, Thomas ..... D2, 22
- Picard, Christine ..... D9, D11, 52, 154
- Pilcher, Clint ..... D43\*
- Pitman, Grace ..... 122
- Potter, Bruce ..... D41\*, 105, 168
- Prather, Chelse ..... D15
- Price, Michael ..... D43
- Price, Paula A. .... 98
- Prischmann-Voldseth, Deirdre ..... 168
- Prochaska, Travis ..... 108\*
- Quellhorst, Hannah ..... D25\*, D4
- Racey, Sophie ..... 128\*
- Rackowski, Joe ..... 35
- Rajarapu, Swapna ..... 141
- Rajashekara, Gireesh ..... 48
- Ramadan, Gomaa ..... 22
- Ramirez, Ricardo ..... 47
- Ranger, Christopher ..... D39, 15
- Rao, Sujaya ..... D35\*, 119\*
- Raudenbush, Amy ..... 57
- Rault, Leslie ..... 5, 201
- Ray, Ann ..... 17, 18, 89
- Raymer, Wade ..... 160
- Reay-Jones, Francis ..... 178
- Reding, Michael ..... D39
- Refsell, Dawn ..... D46
- Reihart, Ryan ..... 55\*
- Reinders, Jordan ..... 98\*
- Reisig, Dominic ..... 178
- Rentz, Michael ..... D48, 94
- Rice, Kevin ..... 45, 71\*, 86, 104\*
- Richardson, Rodney ..... D16, 12
- Richmond, Douglas ..... 47
- Riley, Christopher ..... 61\*
- Rittschof, Clare ..... 7\*, 163\*
- Riusech, Natalia ..... 146\*
- Rodbell, Erika ..... 41\*
- Rodriguez-Soto, Marian ..... 47\*, 65
- Rosendale, Andrew ..... 77\*, 80
- Rozeboom, Philip ..... D22, D48, D40, D21, D7,  
D52\*, 26, 94, 169, 170
- Ruiz, Paulina ..... 75\*
- Safalaoh, Andy ..... 130
- Salgado Astudillo, Sara ..... 99
- Sanchez, Mariana ..... 24\*, 79
- Sanchez-Sedillo, Benjamin .. D31\*, 197
- Sandell, Lowell ..... D46
- Sattler, Scott E. .... 95
- Savage, Benjamin ..... D19\*
- Scharf, Michael ..... 21
- Scheff, Deanna ..... 151\*
- Schilling, M. Wes ..... 22
- Schreiner, Melissa ..... 181\*
- Schulte Moore, Lisa ..... 116
- Schwarting, Holly ..... 188\*
- Scott, Sarah ..... 30\*
- Scully, Erin ..... D2, 78, 155\*
- Seals, Cody ..... 183
- Seigel, Joel ..... 139
- Shepherd, Sebastian ..... 68\*
- Short, Sarah ..... 157\*
- Shott, Chloe ..... 132
- Shrestha, Ram B. .... 189\*
- Shryock, Nancy ..... 36\*
- Shulte Moore, Lisa ..... 37
- Siegfried, Blair ..... 24
- Silver, Kristopher ..... 25
- Simard, Audrey ..... 33\*
- Siperstein, Alden ..... 13\*
- Sivakoff, Frances S. .... 30
- Skidmore, Amanda ..... D1, D37\*, D12, D30, 115\*
- Slotkin, R. .... 175
- Smith, C. Michael ..... 138
- Smith, Harper ..... D14\*
- Smith, Jada ..... 6, 158\*
- Smith, Mark ..... 74\*
- Smith, Mike ..... D16
- Snook, Joshua ..... 88\*
- Souza, Dariane ..... 177\*
- Spring, MaLisa ..... 152\*

- St. Clair, Ashley..... 101\*, 116, 150  
 St. Clair, Coy ..... 176\*  
 St. Claire, Madeline..... D7\*, 120\*  
 Stamper, Caitlin..... D1, D30\*  
 Stamper, Trevor ..... 27, 134, 135\*  
 Steffan, Shawn..... 109\*, 190  
 Stein, David..... 101  
 Stillson, Patrick..... 44\*  
 Stone, Chris..... 50  
 Strang, Carl ..... D53\*  
 Suresh, Sreelakshmi..... 12  
 Swoboda Bhattarai, Katharine ..... 99, 179\*  
 Syed, Zainulabeuddin ..... 76\*  
 Szendrei, Zsofia ..... 31, 44, 88  
 Teets, Nicholas ..... 202  
 Ternest, John ..... 144\*  
 Tilmon, Kelley..... 57, 103\*, 168  
 Tobin, Kelsey..... 17\*  
 Toth, Amy..... 101, 116, 150  
 Trabanino, Ana..... 48\*  
 Trail, Samantha ..... D44\*, 40, 84\*  
 Travers, Andrew..... D5\*  
 Traylor, Clayton ..... 17, 18\*  
 Turnbull, Matthew ..... 178  
 Turner, Kyle ..... D9\*  
 Turo, Katie ..... 102\*  
 Tyndall, John..... 37, 42  
 Tyner, Samantha ..... 122  
 Tyrpak, Alex..... 35\*  
 Umeda, Kai ..... 47  
 Vakil, Surabhi ..... 96\*  
 Valencia, Arnubio ..... 24, 96  
 Valmorbida, Ivair..... 53\*  
 Varenhorst, Adam..... D52, D21, D7, D48, D22, D40,  
 26, 94, 105, 168, 169, 170\*,  
 174\*  
 Varsani, Suresh..... 95  
 Velez, Ana ..... 24, 29, 79\*, 96  
 Venette, Robert ..... 164\*, 192  
 Villanueva, Raul T..... D20, D51  
 Volenberg, Dean ..... D14  
 Volkman, Matthew..... 14\*  
 Wagner, Patrick ..... D48, D52, 94, 170  
 Walston, Allison..... D46  
 Webster, Thomas C. .... 8  
 Weiblen, George ..... 186\*  
 Weingarten, Chloe ..... D6\*  
 Welter, Matthew ..... 29\*  
 Wenger, Johnathan ..... 186  
 Wetzel, William..... 88, 91  
 Whisenant, Jacquelyn ..... D55  
 Whitworth, Jeff ..... 188  
 Widener, Ashlee..... D32\*  
 Wijeratne, Saranga ..... 175  
 Wilkins, Rachel..... 85\*  
 Williams, David ..... 185\*  
 Wiman, Nik G..... 118  
 Wojahn, Braden..... 95  
 Wolanin, Theresa..... 121\*  
 Wolfe, Zachery..... 21\*  
 Wolfgang, Samantha..... 133  
 Wong, Colin..... 54\*  
 Wong, Jessica..... 118  
 Wright, Robert ..... D17, 56, 99, 105  
 Wu-Smart, Judy..... 96, 145, 159\*  
 Xiong, Xi..... 47  
 Yaninek, Steve ..... D12, D37, 115  
 Yates-Stewart, Ashley ..... 175\*  
 Young, Daniel K. .... D55, 161\*  
 Zhang, Ge ..... 37, 101, 116\*, 143, 150  
 Zhu, Kun Yan..... 25  
 Zukoff, Sarah..... 179

# Common Name Index

American dog tick .....	54	maize weevil .....	D2, D25
Asian tiger mosquito .....	50, D1	mold mite .....	22
Asiatic garden beetle .....	57, 103	monarch butterfly .....	36, 37, 58, 62, 69, 122, D6, D26
bed bug .....	13, 14	navel orangeworm .....	139
bird cherry-oat aphid .....	138, 166	northern corn rootworm .....	100, D43, D46, D49, D50
black blow fly .....	52, D9	northern house mosquito .....	49
black soldier fly .....	130	oleander aphid .....	62, D26
bluegrass billbug .....	47	onespotted stink bug .....	56
brown marmorated stink bug .....	45, 46, 104, 118, 141, 165, 192, D27	pea leaf weevil .....	108
cabbage looper .....	91	potato aphid .....	137
carrot weevil .....	64	red flour beetle .....	78, D2, D4
cigarette beetle .....	22	red grasshopper mite .....	D48
Colorado potato beetle .....	88, 136, 197, D31	red sunflower seed weevil .....	D52
common eastern bumble bee .....	30, 96	redshouldered stink bug .....	56
common green lacewing .....	195	rice weevil .....	D4
confused flour beetle .....	151	Rocky Mountain billbug .....	47
corn earworm .....	178	samurai wasp .....	118
corn leaf aphid .....	117	soybean aphid .....	41, 42, 53, 59, 168, 173, 174, 175, 193, D3, D21, D24, D41, D42
deckles stem borer .....	D20	soybean looper .....	45
eastern treehole mosquito .....	51	spined soldier bug .....	91
emerald ash borer .....	60, 89, 198	spotted cucumber beetle .....	25, D12
English grain aphid .....	138, 166	spotted lanternfly .....	124, D47
fall armyworm .....	45, 48	spotted-wing drosophila .....	16, 106, 194, 202, D19, D28
Formosan subterranean termite .....	140	striped cucumber beetle .....	115, 144, D12
German cockroach .....	21	sugarcane aphid .....	39
granary weevil .....	92	tawny crazy ant .....	55, D15
green peach aphid .....	D23, D39	threecornered alfalfa hopper .....	D14
green stink bug .....	56	twospotted lady beetle .....	195
greenbug .....	95, 138	warehouse beetle .....	85, D4
hairy fungus beetle .....	D55	western bean cutworm .....	99, 179, 199
hairy maggot blow fly .....	154	western corn rootworm .....	24, 29, 79, 98, 100, 176, 177, 189, D38, D43, D46, D49, D50
Hessian fly .....	188	western tarnished plant bug .....	40, 63
honey bee .....	6, 7, 8, 9, 10, 12, 20, 33, 96, 101, 115, 116, 145, 148, 150, 158, D16, D18	wheat curl mite .....	43
honey bee mite .....	6	wheat stem sawfly .....	38, 107
hunting billbug .....	47	yellowfever mosquito .....	49, 157, 201
Japanese beetle .....	86, 97		
khapra beetle .....	200		
larger grain borer .....	167, D25		
lesser grain borer .....	D2		

# Scientific Name Index

- Acari Acaridae *Tyrophagus putrescentiae* ..22  
 Acari Eriophyidae *Aceria tosichella* .....43  
 Acari Ixodidae *Dermacentor variabilis*.....54  
 Acari Tarsonemidae *Acarapis woodi*.....6  
 Acari Trombidiidae *Eutrombidium locustarum* ...D48  
 Acari Varroidae *Varroa destructor* .....158  
 Araneae .....123  
 Blattodea Blattellidae *Blattella germanica* .21  
 Coleoptera.....D8  
 Coleoptera Anobiidae *Lasioderma serricorne* ....22  
 Coleoptera Bostrichidae *Prostephanus truncatus* .167, D25  
 Coleoptera Bostrichidae *Rhyzopertha dominica* ..D2  
 Coleoptera Buprestidae *Agrilus planipennis*.....60, 89, 198  
 Coleoptera Carabidae .....19  
 Coleoptera Cerambycidae.....17  
 Coleoptera Cerambycidae *Dectes texanus* .D20  
 Coleoptera Chrysomelidae *Acalymma vittatum*...115, 144, D12  
 Coleoptera Chrysomelidae *Diabrotica barberi* ....100, D43, D46, D49, D50  
 Coleoptera Chrysomelidae *Diabrotica undecimpunctata howardi* 25, D12  
 Coleoptera Chrysomelidae *Diabrotica virgifera virgifera* 24, 29, 79, 98, 100, 176, 177, 189, D38, D43, D46, D49, D50  
 Coleoptera Chrysomelidae *Leptinotarsa decemlineata* 88, 136, 197, D31  
 Coleoptera Chrysomelidae *Systema frontalis* .....196  
 Coleoptera Coccinellidae .....87  
 Coleoptera Coccinellidae *Adalia bipunctata* .....195  
 Coleoptera Curculionidae *Listronotus oregonensis* 64  
 Coleoptera Curculionidae *Sitona lineatus* ..108  
 Coleoptera Curculionidae *Sitophilus granarius*...92  
 Coleoptera Curculionidae *Sitophilus oryzae*.....D4  
 Coleoptera Curculionidae *Sitophilus zeamais* ....D2, D25  
 Coleoptera Curculionidae *Smicronyx fulvus*.....D52  
 Coleoptera Curculionidae *Sphenophorus cicatristriatus* 47  
 Coleoptera Curculionidae *Sphenophorus parvulus* 47  
 Coleoptera Curculionidae *Sphenophorus venatus vestitus* 47  
 Coleoptera Dermestidae *Trogoderma granarium* .200  
 Coleoptera Dermestidae *Trogoderma variabile* ..85, D4  
 Coleoptera Elmidae *Hydora*.....153  
 Coleoptera Mycetophagidae *Typhaea stercorea* ..D55  
 Coleoptera Scarabaeidae *Maladera castanea*....57, 103  
 Coleoptera Scarabaeidae *Popillia japonica*.86, 97  
 Coleoptera Tenebrionidae *Tribolium castaneum* ..78, D2, D4  
 Coleoptera Tenebrionidae *Tribolium confusum* ...151  
 Diptera .....D8  
 Diptera Calliphoridae .....27, 128  
 Diptera Calliphoridae *Chrysomya rufifacies* 154  
 Diptera Calliphoridae *Lucilia cuprina* .....D11  
 Diptera Calliphoridae *Phormia regina*.....52, D9  
 Diptera Cecidomyiidae *Mayetiola destructor*.....188  
 Diptera Cecidomyiidae *Resseliella*.....105  
 Diptera Chironomidae *Chironomus riparius*.....D32  
 Diptera Culicidae *Aedes japonicus* .....51  
 Diptera Culicidae *Aedes aegypti*.....49, 157, 201  
 Diptera Culicidae *Aedes albopictus*.....50, D1  
 Diptera Culicidae *Aedes triseriatus* .....51  
 Diptera Culicidae *Anopheles gambiae*.....49  
 Diptera Culicidae *Culex pipiens* .....49  
 Diptera Drosophilidae *Drosophila suzukii* ..16, 106, 194, 202, D19, D28  
 Diptera Sarcophagidae.....27  
 Diptera Sciaridae.....15  
 Diptera Stratiomyidae *Hermetia illucens* ...130  
 Diptera Syrphidae.....26, D40  
 Diptera Syrphidae *Allograpta obliqua*.....112  
 Diptera Syrphidae *Eupeodes americanus*...112  
 Diptera Syrphidae *Syrphus ribesii* .....112  
 Hemiptera .....D51  
 Hemiptera Aphididae *Aphis aclepiadis*....40  
 Hemiptera Aphididae *Aphis glycines*.....41, 42, 53, 59, 168, 173, 174, 175, 193, D3, D21, D24, D41, D42  
 Hemiptera Aphididae *Aphis nerii*.....62, D26  
 Hemiptera Aphididae *Macrosiphum euphorbiae*..137  
 Hemiptera Aphididae *Melanaphis sacchari* 39  
 Hemiptera Aphididae *Metopolophium dirhodum* .166  
 Hemiptera Aphididae *Myzus persicae*.....D23, D39  
 Hemiptera Aphididae *Rhopalosiphum maidis*....117  
 Hemiptera Aphididae *Rhopalosiphum padi*138, 166  
 Hemiptera Aphididae *Schizaphis graminum* .....95, 138  
 Hemiptera Aphididae *Sitobion avenae*.....138, 166



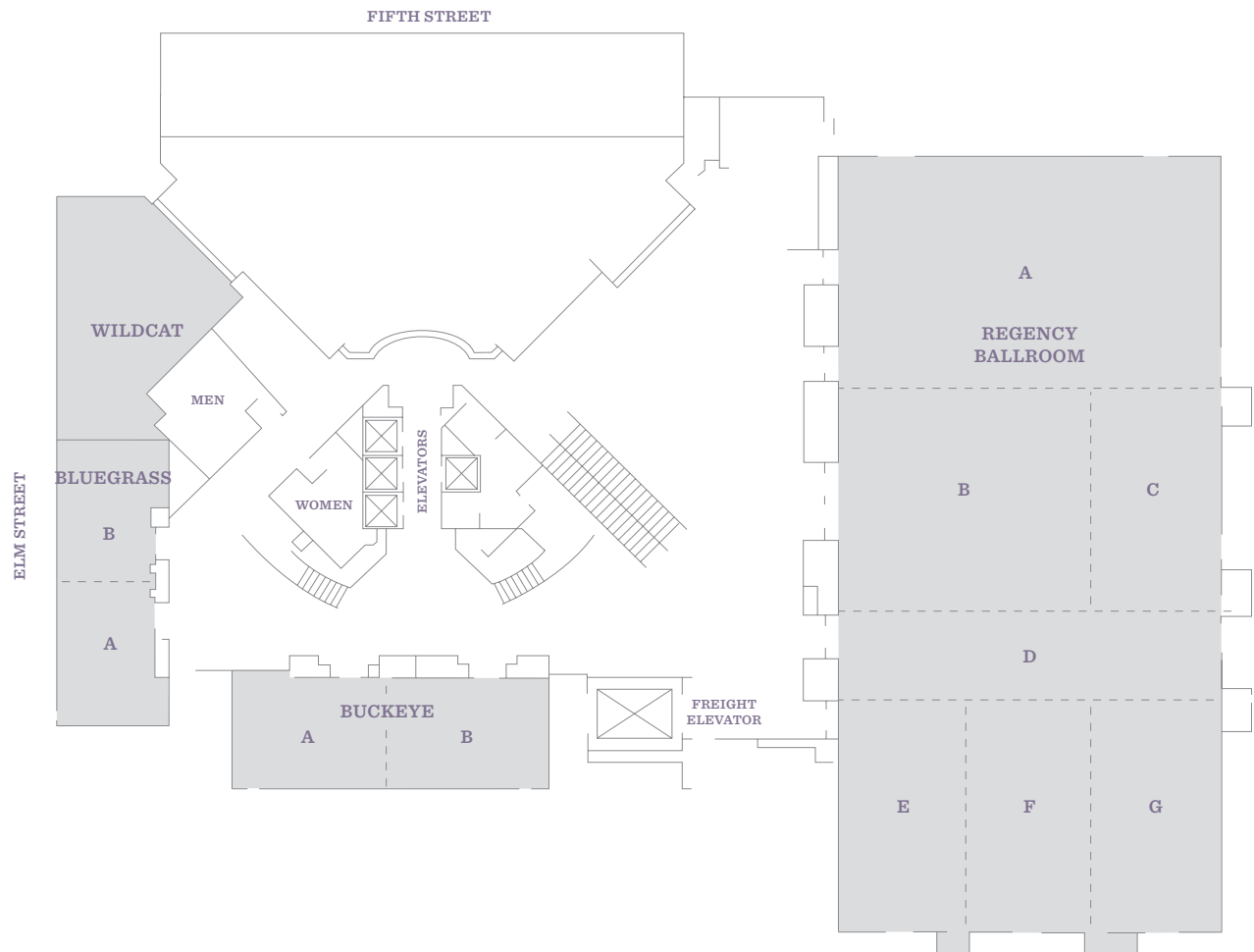
- Hemiptera Cimicidae *Cimex lectularius* ....13, 14  
Hemiptera Fulgoridae *Lycorma delicatula* .124, D47  
Hemiptera Membracidae *Spissistilus festinus* ....D14  
Hemiptera Miridae *Lygus hesperus*.....40, 63  
Hemiptera Pentatomidae *Acrosternum hilare*.....56  
Hemiptera Pentatomidae *Euschistus variolarius* .56  
Hemiptera Pentatomidae *Halyomorpha halys* ...45, 46,  
104, 118, 141,  
165, 192, D27  
Hemiptera Pentatomidae *Podisus maculiventris* .91  
Hemiptera Pentatomidae *Thyanta custator accerra* 56  
Hymenoptera.....26, D8, D40  
Hymenoptera Aphelinidae *Aphelinus certus* .....59  
Hymenoptera Apidae .....D45  
Hymenoptera Apidae *Apis mellifera* .....6, 7, 8, 9, 10, 12,  
20, 33, 96, 101,  
115, 116, 145,  
148, 150, 158,  
D16, D18  
Hymenoptera Apidae *Bombus*.....115, 119  
Hymenoptera Apidae *Bombus impatiens* ..30, 96  
Hymenoptera Apidae *Peponapis pruinosa* .31  
Hymenoptera Braconidae *Bracon cephi*....38  
Hymenoptera Braconidae *Bracon lissogaster* ....38  
Hymenoptera Cephidae *Cephus cinctus* ...38, 107  
Hymenoptera Formicidae *Nylanderia fulva*55, D15  
Hymenoptera Halictidae .....D45  
Hymenoptera Halictidae *Agapostemon splendens*96  
Hymenoptera Halictidae *Halictus confusus* 32  
Hymenoptera Halictidae *Halictus ligatus* ..32  
Hymenoptera Halictidae *Lasioglossum* ....32  
Hymenoptera Megachilidae.....D45  
Hymenoptera Scelionidae *Trissolcus japonicus* ...118  
Hymenoptera Trichogrammatidae *Trichogramma ostrinae*  
99  
Isoptera Rhinotermitidae *Coptotermes formosanus* 140  
Lepidoptera Danaidae *Danaus plexippus* ..36, 37, 58, 62,  
69, 122, D6, D26  
Lepidoptera Gelechiidae *Tuta absoluta* ....D34  
Lepidoptera Gracillariidae *Caloptilia triadicae* ....D15  
Lepidoptera Noctuidae *Chrysodeixis includens* ...45  
Lepidoptera Noctuidae *Helicoverpa zea* ...178  
Lepidoptera Noctuidae *Spodoptera frugiperda* ...45, 48  
Lepidoptera Noctuidae *Striacosta albicosta*.....99, 179,  
199  
Lepidoptera Noctuidae *Trichoplusia ni*....91  
Lepidoptera Pyralidae *Amyelois transitella* .139  
Neuroptera Chrysopidae *Chrysoperla plorabunda*195  
Neuroptera Chrysopidae *Chrysoperla rufilabris* ...195  
Odonata.....152  
Orthoptera Acrididae .....94  
Orthoptera Gryllidae *Neonemobius cubensis*.....D53  
Orthoptera Gryllidae *Neonemobius variegatus*....D53

## Hyatt Regency Cincinnati Floor Plan

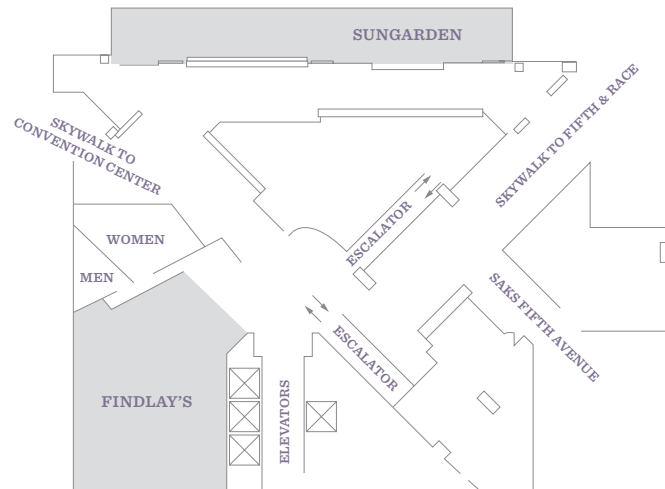
T +1 513 579 1234  
F +1 513 354 4299  
cincinnati.hyatt.com



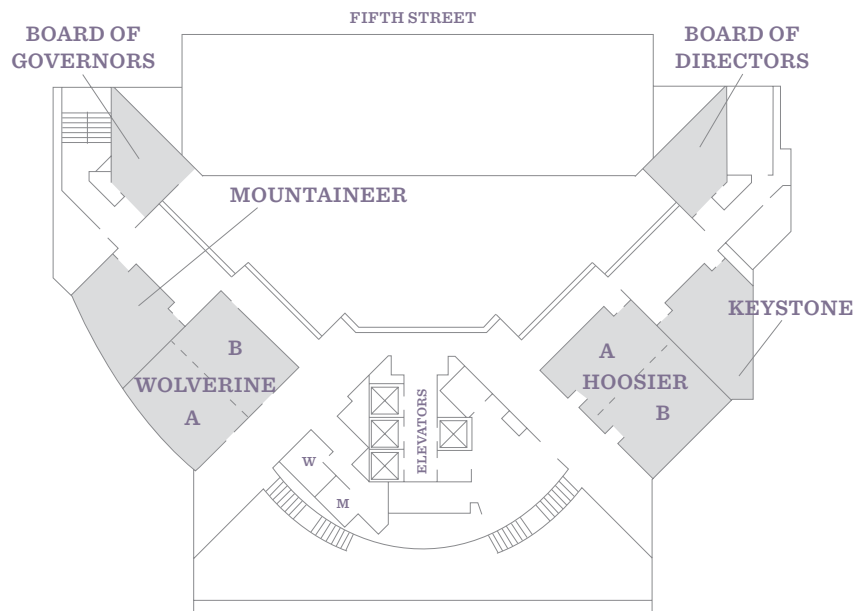
### THIRD FLOOR



SECOND FLOOR



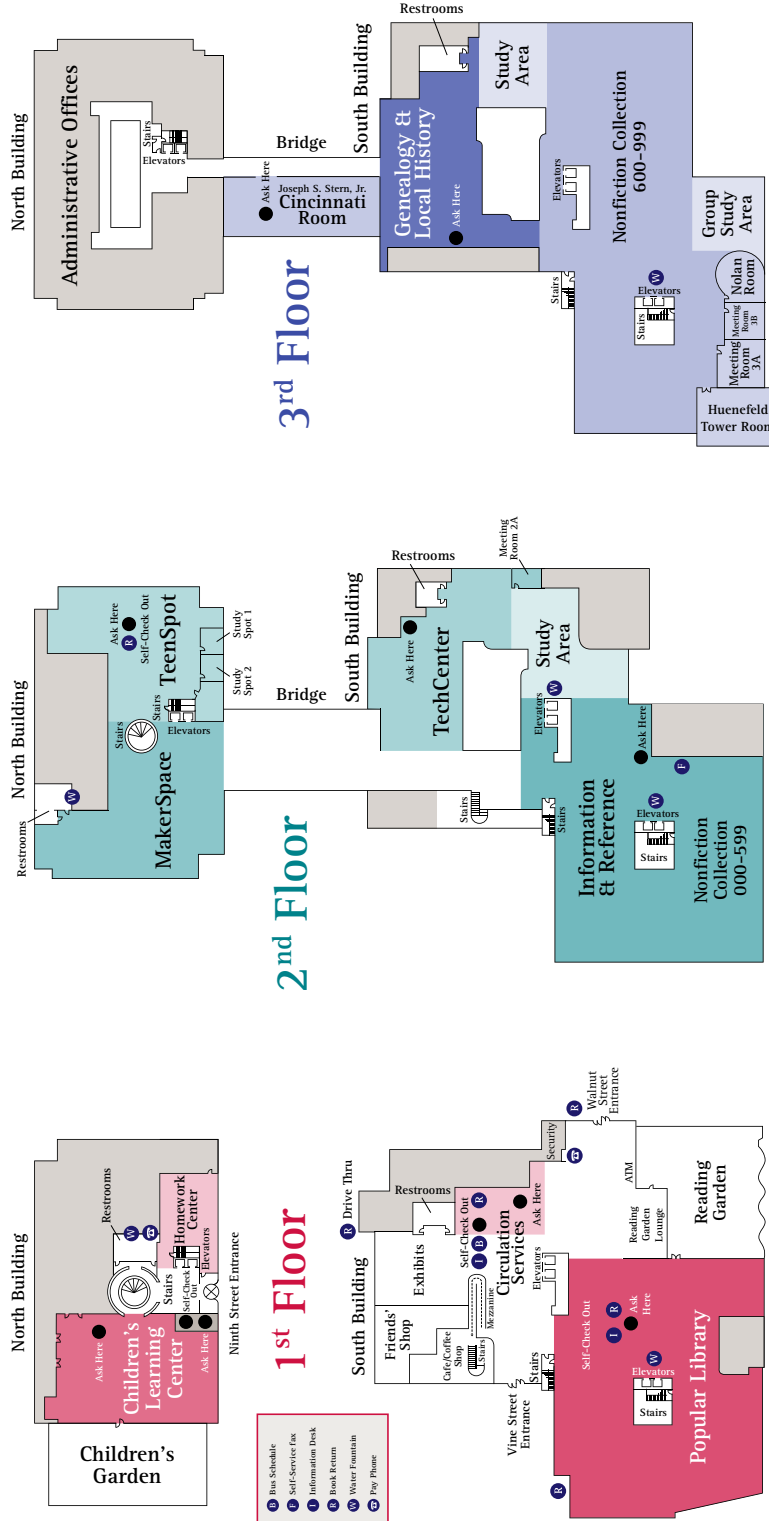
FOURTH FLOOR



# Student and Early Career Professionals Luncheon

## Sponsored by *Bayer Crop Science*

Welcome to the Main Library of the Public Library of Cincinnati & Hamilton County



Administration	3 North	Circulation Services	1 South & 1 North	Huenefeld Tower Room	3 South	Nonfiction 001-599	2 South	Resource Center	2 South
Cafe/Coffee Shop	Mezzanine	Exhibits	1 South	Information & Reference	2 South	Nonfiction 600-999	3 South	TechCenter	2 South
Children's Garden	1 North	Friends' Shop	Mezzanine	Meeting Room 2A	2 South	Popular Library	1 South	TeenSpot	2 North
Children's Learning Center	1 North	Genecology & Local History	3 South	Meeting Rooms 3A & 3B	3 South	Reading Garden Lounge	1 South		
Cincinnati Room	3 Bridge	Homework Center	1 North	Nolan Room	3 South	Reading Garden	1 South		



**PLEASE MARK  
YOUR CALENDARS!**

Plan to Attend the  
ESA-NCB-SWB Annual Meeting  
in  
Oklahoma City, OK  
15 – 18 March 2020





## ENTOMOLOGY 2019

NOVEMBER 17-20 • ST. LOUIS, MO  
America's Center Convention Complex

# Share your visionary ideas!

*Increase awareness of our science and its importance to Society through your research and other creative work. Plan to share your ideas with more than 3,600 others interested in reshaping and elevating the exciting world of entomology during Entomology 2019.*

**Submit a  
paper or poster**  
**[entsoc.org/submit](http://entsoc.org/submit)**  
(submissions open mid April)

## St. Louis, our host city

Centrally located in America's heartland, St. Louis offers many treasures. Come explore the famous Gateway Arch, Riverfront, Forest Park, river boats on the Mississippi, Botanical Gardens, Science Center, Zoo, museums, and more. Also known for its world-class sports, you can enjoy an abundance of walking paths and biking trails, diverse live music venues and a vibrant food scene in the Gateway City.

Watch eNews and visit  
**[entsoc.org/entomology2019](http://entsoc.org/entomology2019)** for details.

QUESTIONS? **[meet@entsoc.org](mailto:meet@entsoc.org)**



Sharing Insect Science Globally | [entsoc.org/entomology2019](http://entsoc.org/entomology2019)

### IMPORTANT DATES/DEADLINES:

Paper, Posters, 3-min Presentations including Student Competition, and Lunch & Learns submission deadline	MAY 24, 2019
ESA Awards nominations deadline	MAY 31, 2019
Registration & Housing opens	JUNE 5, 2019
Function deadline (no fee)	JUNE 14
Virtual Poster deadline	JULY 31